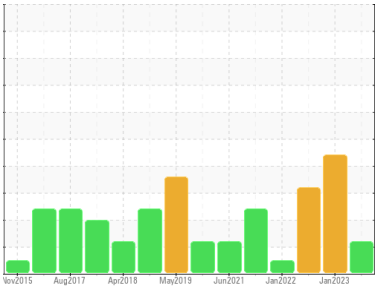
# PROBLEM SUMMARY

Sample Rating Trend

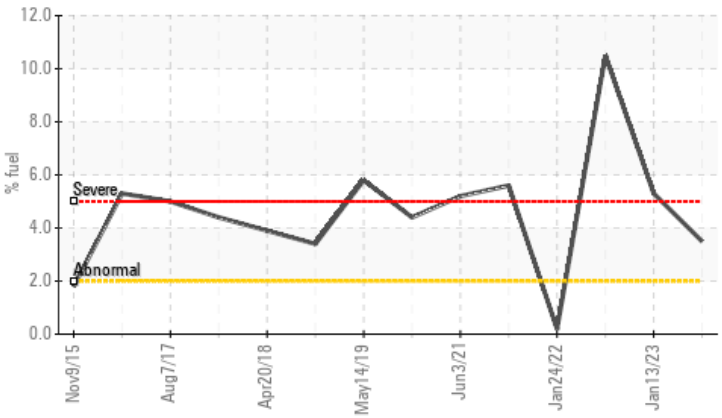



**FUEL**

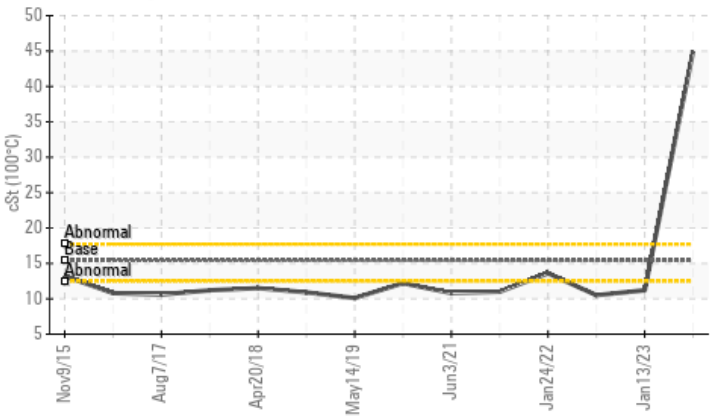
Machine Id
**11207**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (28 GAL)**

## COMPONENT CONDITION SUMMARY

Fuel Dilution




Viscosity @ 100°C




## RECOMMENDATION

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

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | **ABNORMAL** | ABNORMAL | SEVERE |
|---|---|---|---|---|---|---|
| Fuel | % | ASTM D3524 | >2.0 | ▲ **3.5** | ▲ 5.3 | ⬢ 10.5 |
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **44.9** | ▲ 11.2 | ▲ 10.5 |


**Customer Id:** GFL035
**Sample No.:** GFL0071576
**Lab Number:** 05905272
**Test Package:** FLEET

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
Wes Davis +1 905-569-8600 x223
wesd@wearcheck.ca

*To change component or sample information:*
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |

## HISTORICAL DIAGNOSIS

**13 Jan 2023 Diag: Jonathan Hester**

DIRT

We advise that you check the fuel injection system. We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.Cylinder, crank, or cam shaft wear is indicated. There is a moderate amount of fuel present in the oil. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

view report

**01 Aug 2022 Diag: Don Baldridge**

FUEL

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.Cylinder, crank, or cam shaft wear is indicated. There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

view report

**24 Jan 2022 Diag: Wes Davis**

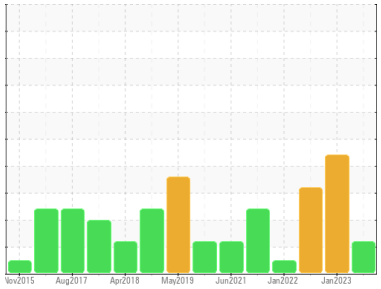
NORMAL

Resample at the next service interval to monitor. No other corrective action is recommended at this time.All component wear rates are normal. Fuel content negligible. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

view report

# OIL ANALYSIS REPORT

Sample Rating Trend




**FUEL**

Machine Id
**11207**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (28 GAL)**

## DIAGNOSIS

**Recommendation**
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 moderate 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 | | **GFL0071576** | GFL0061711 | GFL0014732 |
| Sample Date | | Client Info | | **11 Jul 2023** | 13 Jan 2023 | 01 Aug 2022 |
| Machine Age | hrs | Client Info | | **10941** | 10941 | 10941 |
| Oil Age | hrs | Client Info | | **600** | 600 | 600 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | SEVERE |

| 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 | >75 | **28** | ▲ 118 | ▲ 158 |
| Chromium | ppm | ASTM D5185m | >4 | **<1** | 2 | 2 |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | 4 | 3 |
| Titanium | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >3 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >15 | **4** | ▲ 10 | 5 |
| Lead | ppm | ASTM D5185m | >15 | **<1** | 3 | 14 |
| Copper | ppm | ASTM D5185m | >30 | **<1** | 4 | 10 |
| Tin | ppm | ASTM D5185m | >4 | **<1** | <1 | 2 |
| Antimony | ppm | ASTM D5185m | | **---** | --- | --- |
| 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 | **4** | 3 | 5 |
| Barium | ppm | ASTM D5185m | 0 | **<1** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **72** | 69 | 77 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | 1 | 2 |
| Magnesium | ppm | ASTM D5185m | 1010 | **1030** | 791 | 784 |
| Calcium | ppm | ASTM D5185m | 1070 | **1181** | 1096 | 1080 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1167** | 941 | 864 |
| Zinc | ppm | ASTM D5185m | 1270 | **1371** | 1130 | 1106 |
| Sulfur | ppm | ASTM D5185m | 2060 | **4127** | 2944 | 2748 |

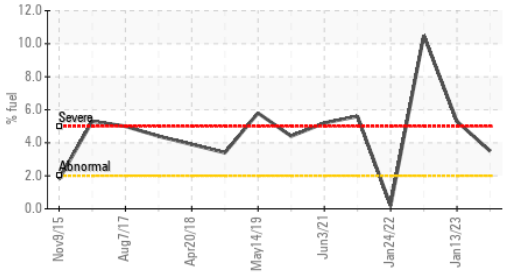
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >20 | **10** | ▲ 22 | 7 |
| Sodium | ppm | ASTM D5185m | | **10** | 16 | 42 |
| Potassium | ppm | ASTM D5185m | >20 | **0** | 2 | 3 |
| Fuel | % | ASTM D3524 | >2.0 | ▲ **3.5** | ▲ 5.3 | ⬢ 10.5 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.3** | 0.4 | 1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **6.3** | 7.5 | 12.2 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **17.7** | 18.6 | 23.5 |

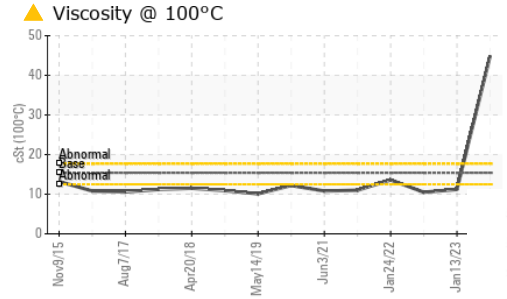
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **13.8** | 14.3 | 21.0 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **9.3** | 8.9 | 7.1 |

# OIL ANALYSIS REPORT

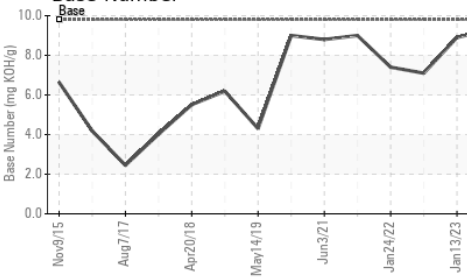
Fuel Dilution




Viscosity @ 100°C




Base Number

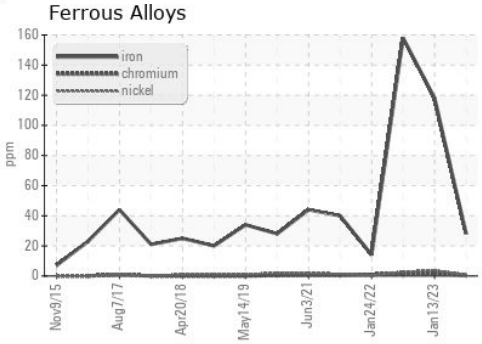



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

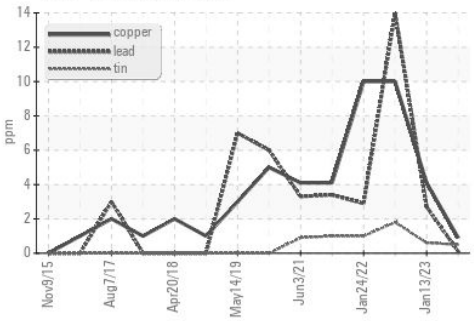
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **44.9** | ▲ 11.2 | ▲ 10.5 |

## GRAPHS

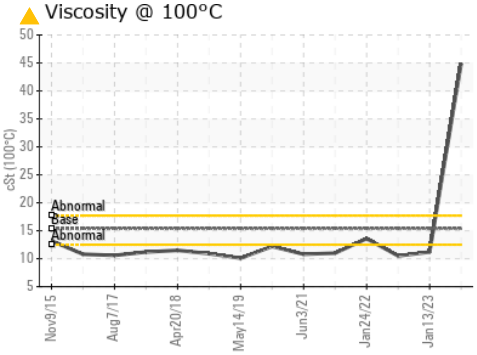
Ferrous Alloys



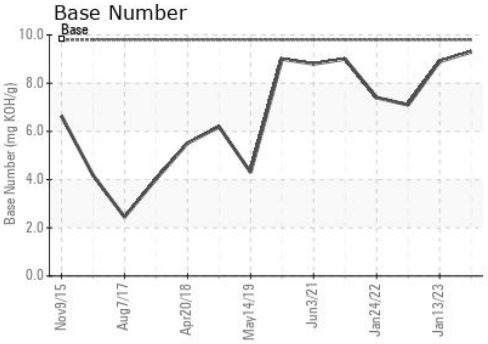

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0071576 **Received** : 24 Jul 2023
**Lab Number** : 05905272 **Diagnosed** : 25 Jul 2023
**Unique Number** : 10566628 **Diagnostician** : Wes Davis
**Test Package** : FLEET ( 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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Report Id: GFL035 [WUSCAR] 05905272 (Generated: 07/25/2023 11:51:56) Rev: 1

Submitted By: JORGE COSTA