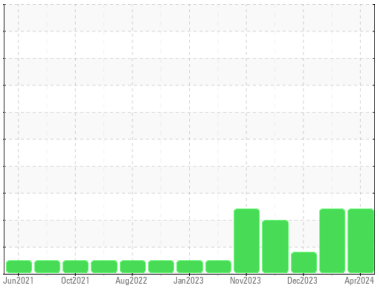
# PROBLEM SUMMARY

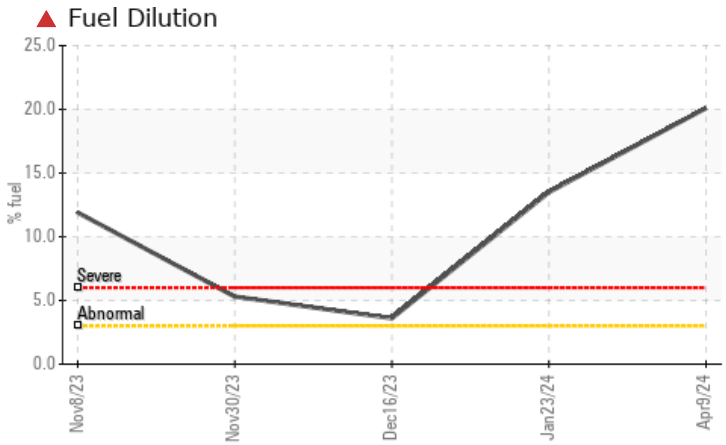
Machine Id
**4641M**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

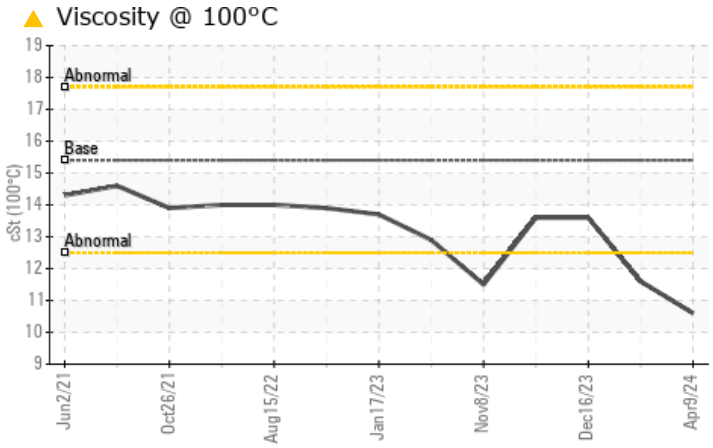
**Sample Rating Trend**




**FUEL**

## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

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.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | **SEVERE** | SEVERE | ABNORMAL |
|---|---|---|---|---|---|---|
| Fuel | % | ASTM D3524 | >3.0 | ▲ **20.1** | ▲ 13.5 | ▲ 3.6 |
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **10.6** | ▲ 11.6 | 13.6 |

**Customer Id:** GFL415
**Sample No.:** GFL0117724
**Lab Number:** 06146420
**Test Package:** FLEET

*To manage this report scan the QR code*

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*To change component or sample information:*
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customerservice@wearcheck.com

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Change Fluid | --- | --- | ? | Oil and filter change at the time of sampling has been noted. |
| Change Filter | --- | --- | ? | Oil and filter change at the time of sampling has been noted. |
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |
| Check Fuel/injector System | --- | --- | ? | We advise that you check the fuel injection system. |

## HISTORICAL DIAGNOSIS

FUEL

**23 Jan 2024 Diag: Don Baldridge**
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.All component wear rates are normal. There is a high amount of fuel present 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

FUEL

**16 Dec 2023 Diag: Wes Davis**
The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.All component wear rates are normal. There is a moderate 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. The oil is no longer serviceable due to the presence of contaminants.

view report

GLYCOL

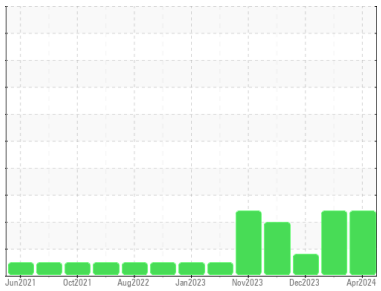
**30 Nov 2023 Diag: Jonathan Hester**
We advise that you check the fuel injection system. Resample at the next service interval to monitor.All component wear rates are normal. Sodium and/or potassium levels are high. There is a moderate amount of fuel present in the oil. Test for glycol is negative. 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

Machine Id
**4641M**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

Sample Rating Trend




**FUEL**

## DIAGNOSIS

**Recommendation**
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.

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

**Contamination**
There is a high amount of fuel present in the oil.

**Fluid Condition**
Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0117724** | GFL0108798 | GFL0105773 |
| Sample Date | | Client Info | | **09 Apr 2024** | 23 Jan 2024 | 16 Dec 2023 |
| Machine Age | hrs | Client Info | | **16101** | 15524 | 15207 |
| Oil Age | hrs | Client Info | | **15524** | 15207 | 15085 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **SEVERE** | SEVERE | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| 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 | **32** | 26 | 10 |
| Chromium | ppm | ASTM D5185m | >20 | **1** | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **1** | <1 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **4** | 5 | 3 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **0** | <1 | 2 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | 0 | <1 |
| 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 | **1** | 0 | <1 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **43** | 46 | 53 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 1010 | **727** | 761 | 853 |
| Calcium | ppm | ASTM D5185m | 1070 | **819** | 836 | 972 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **808** | 846 | 965 |
| Zinc | ppm | ASTM D5185m | 1270 | **1018** | 990 | 1144 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2806** | 2313 | 3327 |

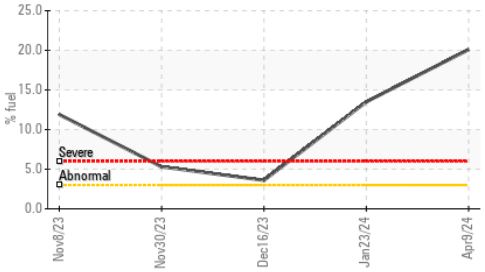
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **5** | 4 | 3 |
| Sodium | ppm | ASTM D5185m | | **6** | 3 | 4 |
| Potassium | ppm | ASTM D5185m | >20 | **5** | 4 | 4 |
| Fuel | % | ASTM D3524 | >3.0 | ▲ **20.1** | ▲ 13.5 | ▲ 3.6 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >6 | **1.1** | 1.2 | 0.6 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **16.5** | 15.3 | 9.3 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **25.7** | 24.5 | 19.7 |

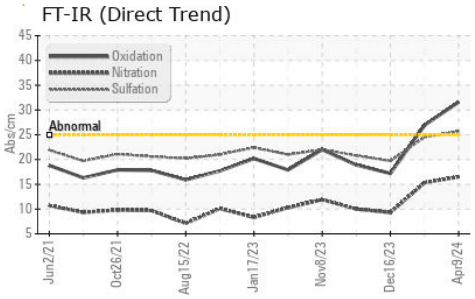
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **31.6** | 26.9 | 17.2 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **6.1** | 5.5 | 8.5 |

# OIL ANALYSIS REPORT

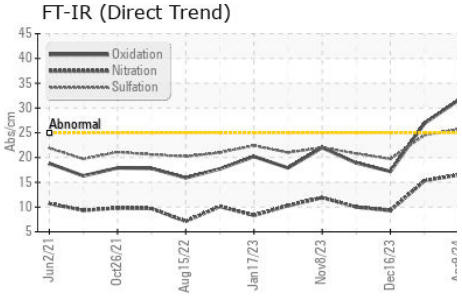
Fuel Dilution



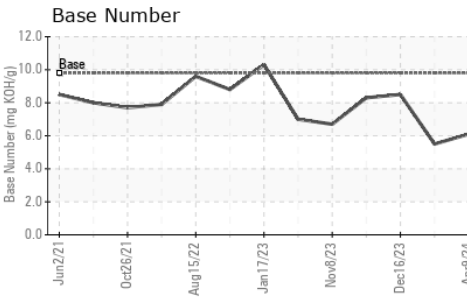

FT-IR (Direct Trend)




FT-IR (Direct Trend)




Base Number

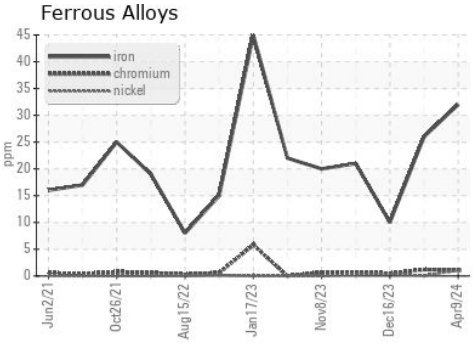



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

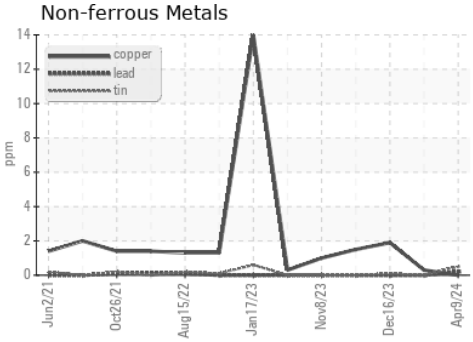
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **10.6** | ▲ 11.6 | 13.6 |

## GRAPHS

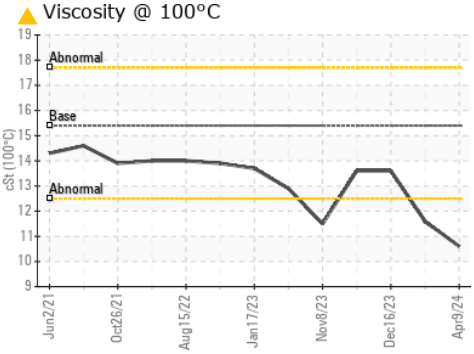
Ferrous Alloys



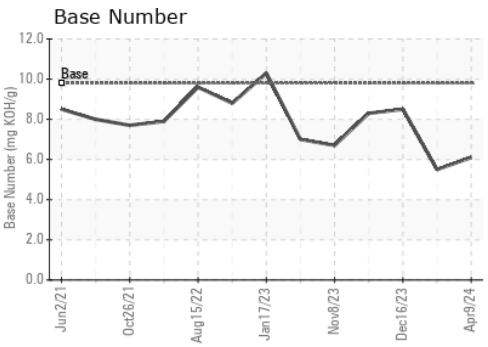

Non-ferrous Metals




▲ Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0117724
**Lab Number** : 06146420
**Unique Number** : 10976498
**Test Package** : FLEET ( Additional Tests: PercentFuel )

**Received** : 11 Apr 2024
**Tested** : 16 Apr 2024
**Diagnosed** : 16 Apr 2024 - Sean Felton

*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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