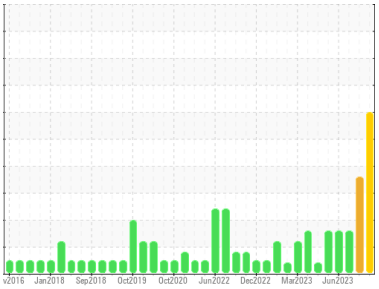
# PROBLEM SUMMARY

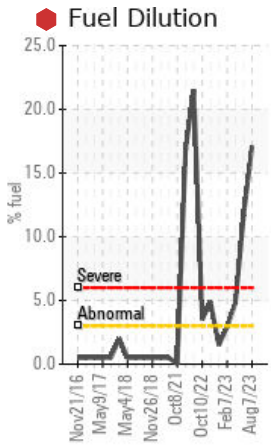
**Sample Rating Trend**

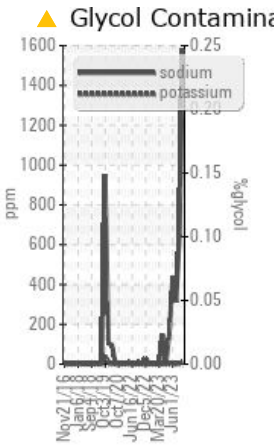


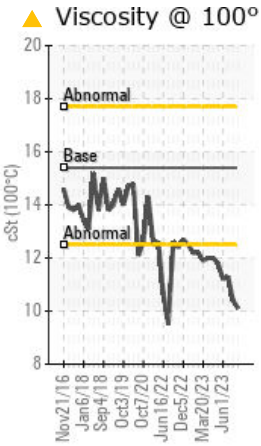
**FUEL**

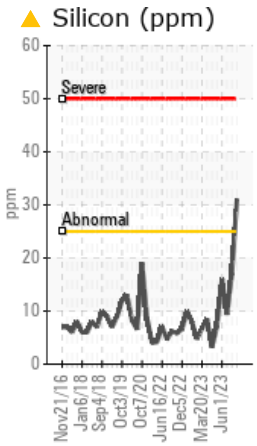
Machine Id
**10669**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (7 GAL)**

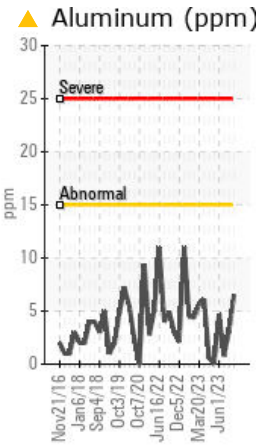
## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. 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. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | **SEVERE** | SEVERE | ABNORMAL |
|---|---|---|---|---|---|---|
| Aluminum | ppm | ASTM D5185m | >15 | ▲ **6** | ▲ 3 | <1 |
| Silicon | ppm | ASTM D5185m | >25 | ▲ **31** | ▲ 17 | ▲ 9 |
| Sodium | ppm | ASTM D5185m | | ▲ **1580** | ▲ 648 | ▲ 313 |
| Fuel | % | ASTM D3524 | >3.0 | ⬢ **17.1** | ⬢ 11.7 | <1.0 |
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **10.1** | ▲ 10.4 | ▲ 11.3 |


**Customer Id:** GFL010
**Sample No.:** GFL0088748
**Lab Number:** 05921994
**Test Package:** FLEET

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
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jhester@wearcheckusa.com

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

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Change Fluid | --- | --- | ? | We recommend that you drain the oil and perform a filter service on this component if not already done. |
| Change Filter | --- | --- | ? | We recommend that you drain the oil and perform a filter service on this component if not already done. |
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |
| Check Dirt Access | --- | --- | ? | We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. |
| Check Fuel/injector System | --- | --- | ? | We advise that you check the fuel injection system. |
| Check Glycol Access | --- | --- | ? | We advise that you check for the source of the coolant leak. |

## HISTORICAL DIAGNOSIS

**12 Jul 2023 Diag: Angela Borella**

FUEL

We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check the fuel injection system. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.All component wear rates are normal. Sodium and/or potassium levels are high. 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. Confirm oil type. The oil is no longer serviceable due to the presence of contaminants.

view report

**19 Jun 2023 Diag: Jonathan Hester**

GLYCOL

We advise that you check for possible coolant leak. Check for low coolant level. We recommend an early resample to monitor this condition.All component wear rates are normal. Sodium and/or potassium levels are high. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

view report

**01 Jun 2023 Diag: Jonathan Hester**

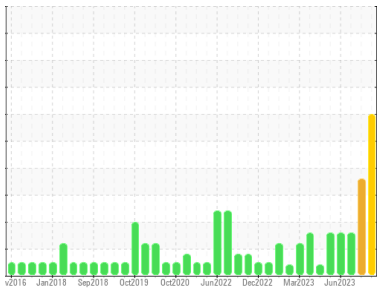
GLYCOL

We advise that you check for the source of the coolant leak. Check for low coolant level. 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. Sodium and/or potassium levels are high. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

view report

# OIL ANALYSIS REPORT

Sample Rating Trend



FUEL

Machine Id
**10669**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (7 GAL)**

## DIAGNOSIS

**Recommendation**
We advise that you check for the source of the coolant leak. Check for low coolant level. 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. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

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

**Contamination**
Sodium and/or potassium levels are high. There is a high amount of fuel present in the oil. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

**Fluid Condition**
Fuel is present in the oil and is lowering the viscosity. 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 | | **GFL0088748** | GFL0086140 | GFL0083207 |
| Sample Date | | Client Info | | **07 Aug 2023** | 12 Jul 2023 | 19 Jun 2023 |
| Machine Age | hrs | Client Info | | **49475** | 49357 | 49171 |
| Oil Age | hrs | Client Info | | **837** | 719 | 533 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Not Changd |
| Sample Status | | | | **SEVERE** | SEVERE | ABNORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >75 | **48** | 27 | 13 |
| Chromium | ppm | ASTM D5185m | >5 | **3** | 2 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | ▲ **6** | 3 | <1 |
| Lead | ppm | ASTM D5185m | >25 | **0** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >100 | **2** | 2 | <1 |
| Tin | ppm | ASTM D5185m | >4 | **<1** | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **27** | 0 | 13 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **112** | 81 | 65 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **610** | 674 | 711 |
| Calcium | ppm | ASTM D5185m | 1070 | **868** | 955 | 1000 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **688** | 761 | 842 |
| Zinc | ppm | ASTM D5185m | 1270 | **913** | 978 | 1004 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2880** | 2973 | 2971 |

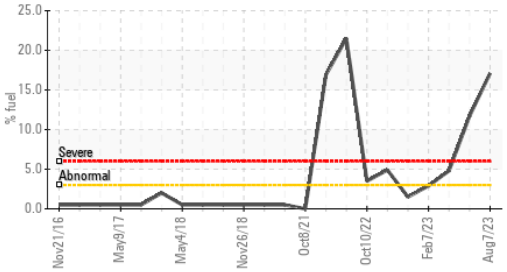
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | ▲ **31** | 17 | 9 |
| Sodium | ppm | ASTM D5185m | | ▲ **1580** | ▲ 648 | ▲ 313 |
| Potassium | ppm | ASTM D5185m | >20 | **8** | 5 | 2 |
| Fuel | % | ASTM D3524 | >3.0 | ⬢ **17.1** | ⬢ 11.7 | <1.0 |
| Glycol | % | *ASTM D2982 | | **NEG** | NEG | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >6 | **2.6** | 1.6 | 0.7 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **15.6** | 12.2 | 8.3 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **26.7** | 22.7 | 19.5 |

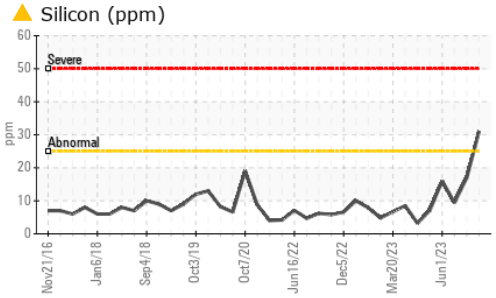
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.7** | 16.9 | 13.3 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **7.9** | 7.7 | 7.8 |

# OIL ANALYSIS REPORT

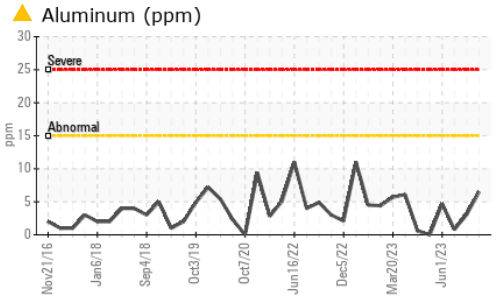
Fuel Dilution



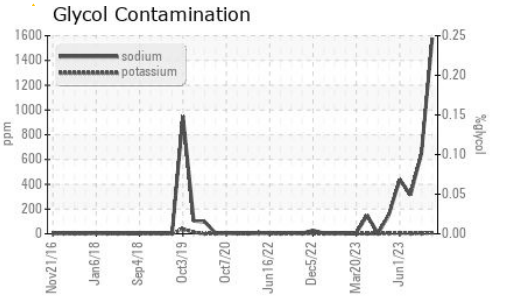

Silicon (ppm)



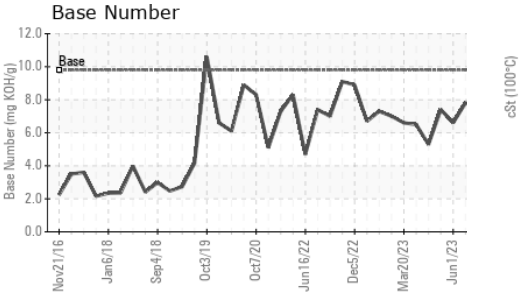

Aluminum (ppm)




Glycol Contamination




Base Number

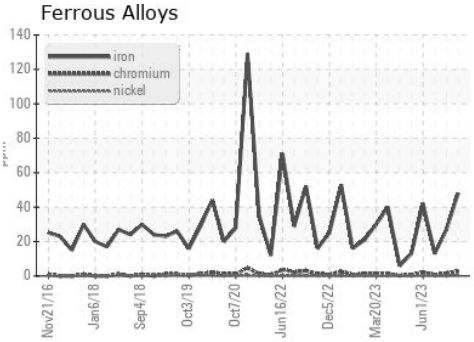



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

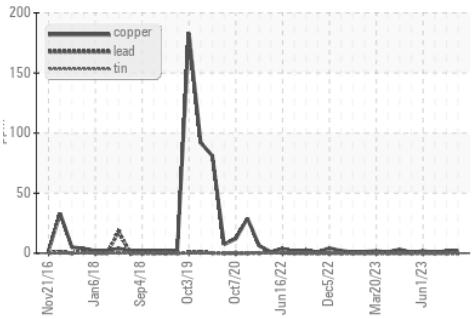
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **10.1** | ▲ 10.4 | ▲ 11.3 |

## GRAPHS

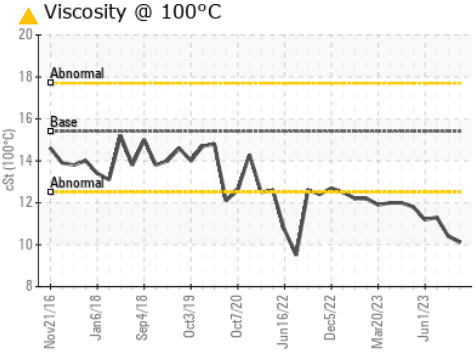
Ferrous Alloys



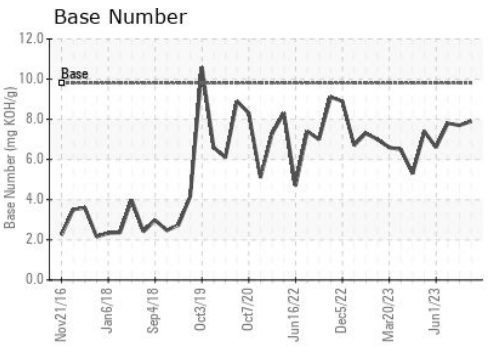

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0088748 **Received** : 11 Aug 2023
**Lab Number** : 05921994 **Diagnosed** : 14 Aug 2023
**Unique Number** : 10601941 **Diagnostician** : Jonathan Hester
**Test Package** : FLEET ( Additional Tests: Glycol, 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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