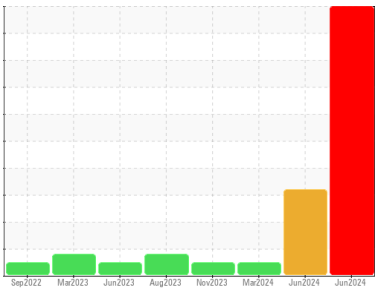
# PROBLEM SUMMARY

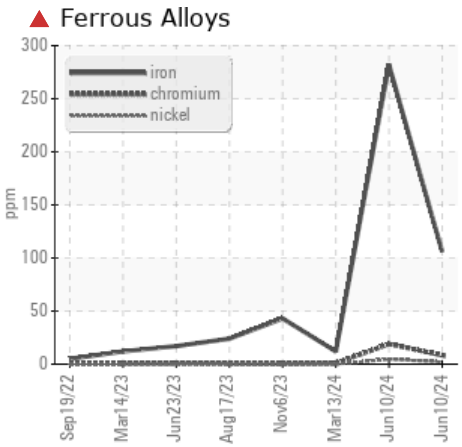
Area
**(BC93221)**
Machine Id
**527043**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

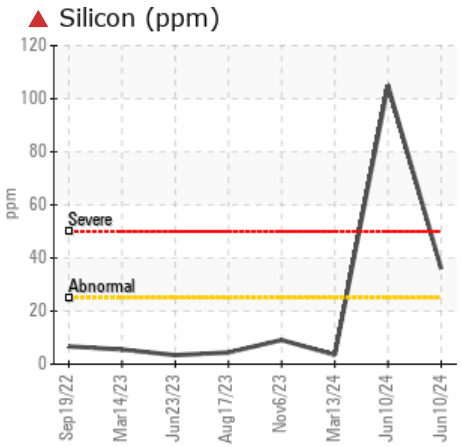
Sample Rating Trend

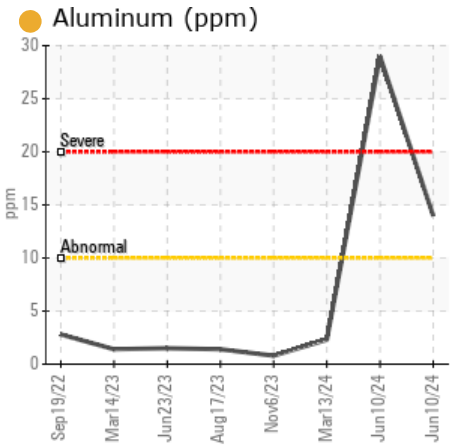



**WEAR**

## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

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 advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | SEVERE | ABNORMAL | NORMAL |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >80 | ▲ **282** | ▲ 106 | 12 |
| Chromium | ppm | ASTM D5185m | >4 | ▲ **19** | 8 | <1 |
| Silicon | ppm | ASTM D5185m | >25 | ▲ **105** | ▲ 36 | 4 |


**Customer Id:** GFL625
**Sample No.:** GFL0116233
**Lab Number:** 06211333
**Test Package:** FLEET

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
Don Baldridge +1
don.b505@comcast.net

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

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Inspect Wear Source | --- | --- | ? | We advise that you inspect for the source(s) of wear. |
| 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. |

## HISTORICAL DIAGNOSIS

DIRT

**10 Jun 2024 Diag: Angela Borella**

We advise that you check all areas where dirt can enter the system. Resample at the next service interval to monitor.A decrease in the iron level is noted. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

view report

NORMAL

**13 Mar 2024 Diag: Jonathan Hester**

Resample at the next service interval to monitor.All component wear rates are normal. 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

NORMAL

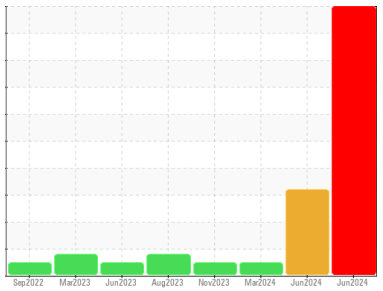
**06 Nov 2023 Diag: Don Baldridge**

Resample at the next service interval to monitor.All component wear rates are normal. 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




**WEAR**

Area
**(BC93221)**
Machine Id
**527043**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

## DIAGNOSIS

**▲ Recommendation**
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 advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

**▲ Wear**
Cylinder, crank, or cam shaft wear is indicated.

**▲ Contamination**
Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

**Fluid Condition**
The oil is no longer serviceable due to the presence of contaminants.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0116233** | GFL0100015 | GFL0101652 |
| Sample Date | | Client Info | | **10 Jun 2024** | 10 Jun 2024 | 13 Mar 2024 |
| Machine Age | hrs | Client Info | | **20324** | 20324 | 19868 |
| Oil Age | hrs | Client Info | | **456** | 500 | 51 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Not Changd |
| Sample Status | | | | **SEVERE** | ABNORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >5 | **<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 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >80 | ▲ **282** | ▲ 106 | 12 |
| Chromium | ppm | ASTM D5185m | >4 | ▲ **19** | 8 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **5** | 2 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | **2** | <1 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **<1** | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | >10 | ● **29** | ● 14 | 2 |
| Lead | ppm | ASTM D5185m | >15 | **8** | 3 | <1 |
| Copper | ppm | ASTM D5185m | >230 | **28** | 16 | 6 |
| Tin | ppm | ASTM D5185m | >4 | **2** | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **7** | 6 | 7 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **61** | 54 | 65 |
| Manganese | ppm | ASTM D5185m | 0 | **5** | 2 | 0 |
| Magnesium | ppm | ASTM D5185m | 1010 | **922** | 837 | 946 |
| Calcium | ppm | ASTM D5185m | 1070 | **1185** | 990 | 1120 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1030** | 885 | 1077 |
| Zinc | ppm | ASTM D5185m | 1270 | **1256** | 1096 | 1226 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3098** | 2798 | 3366 |

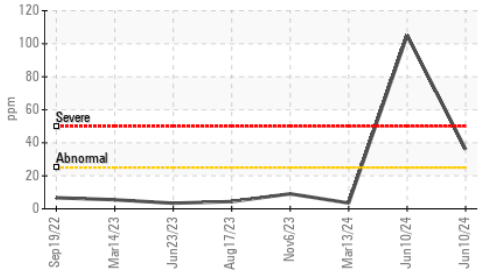
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | ▲ **105** | ▲ 36 | 4 |
| Sodium | ppm | ASTM D5185m | | **9** | 5 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | **11** | 5 | <1 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.5** | 0.4 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **9.1** | 8.6 | 5.8 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **20.2** | 19.8 | 17.7 |

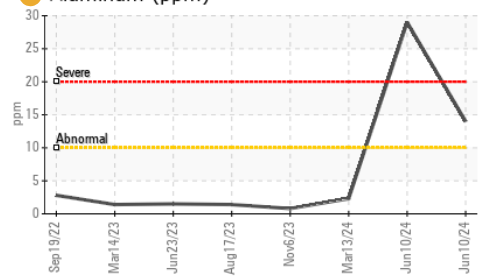
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **16.9** | 16.1 | 13.8 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **7.7** | 8.3 | 8.5 |

# OIL ANALYSIS REPORT

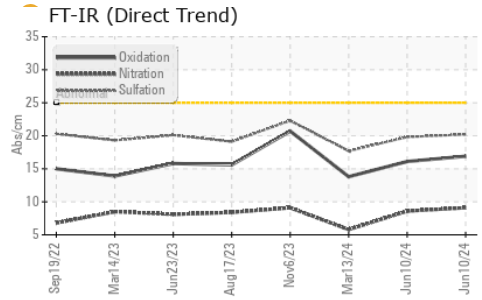
Silicon (ppm)



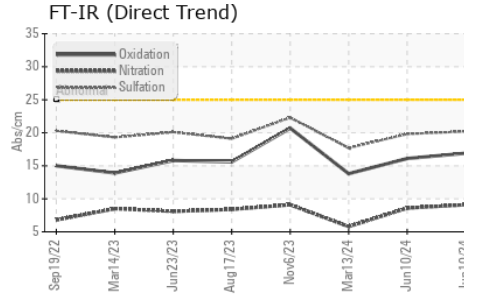

Aluminum (ppm)



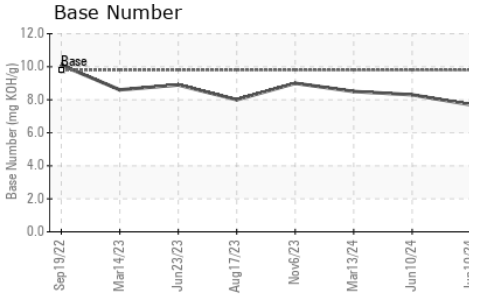

FT-IR (Direct Trend)




FT-IR (Direct Trend)




Base Number

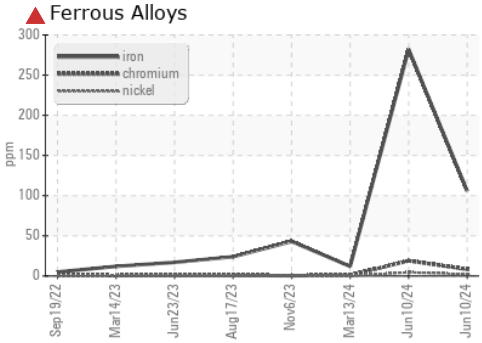



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

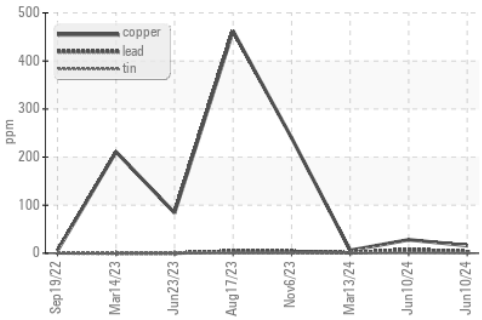
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **13.2** | 13.3 | 13.4 |

## GRAPHS

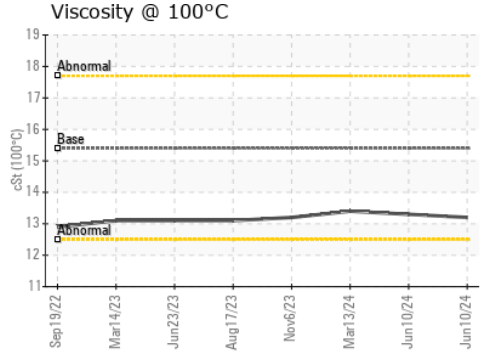
Ferrous Alloys



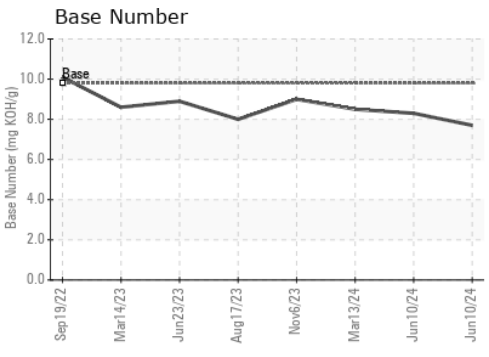

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0116233
**Lab Number** : 06211333
**Unique Number** : 11084197
**Test Package** : FLEET

**Received** : 17 Jun 2024
**Tested** : 19 Jun 2024
**Diagnosed** : 19 Jun 2024 - Don Baldridge

*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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