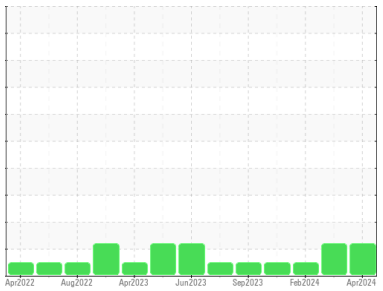
# OIL ANALYSIS REPORT

Sample Rating Trend




**DEGRADATION**

Machine Id
## MACK 732000
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**
Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

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

**Contamination**
There is no indication of any contamination in the oil.

**Fluid Condition**
The BN level is low. The condition of the oil is acceptable for the time in service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0109605** | GFL0087481 | GFL0109584 |
| Sample Date | | Client Info | | **17 Apr 2024** | 06 Mar 2024 | 07 Feb 2024 |
| Machine Age | hrs | Client Info | | **5843** | 5512 | 5241 |
| Oil Age | hrs | Client Info | | **1147** | 816 | 545 |
| Oil Changed | | Client Info | | **Changed** | Not Changd | Not Changd |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | 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 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >75 | **17** | 10 | 8 |
| Chromium | ppm | ASTM D5185m | >5 | **2** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **2** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **<1** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | **3** | 2 | 2 |
| Lead | ppm | ASTM D5185m | >25 | **7** | <1 | 1 |
| Copper | ppm | ASTM D5185m | >100 | **2** | 1 | 1 |
| Tin | ppm | ASTM D5185m | >4 | **2** | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **1** | 0 | <1 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **8** | 7 | 7 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | <1 |
| Molybdenum | ppm | ASTM D5185m | 60 | **64** | 60 | 54 |
| Manganese | ppm | ASTM D5185m | 0 | **2** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **629** | 596 | 546 |
| Calcium | ppm | ASTM D5185m | 1070 | **1821** | 1769 | 1543 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **916** | 731 | 695 |
| Zinc | ppm | ASTM D5185m | 1270 | **1090** | 996 | 974 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2962** | 2462 | 2484 |

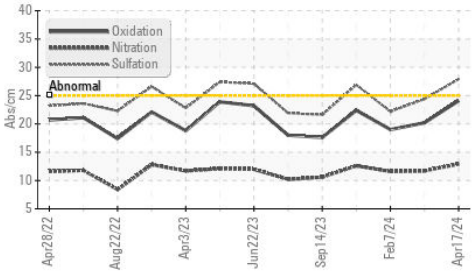
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **6** | 3 | 3 |
| Sodium | ppm | ASTM D5185m | | **10** | 8 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **5** | <1 | 4 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >6 | **0** | 0 | 0 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **12.9** | 11.7 | 11.6 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **27.9** | 24.4 | 22.2 |

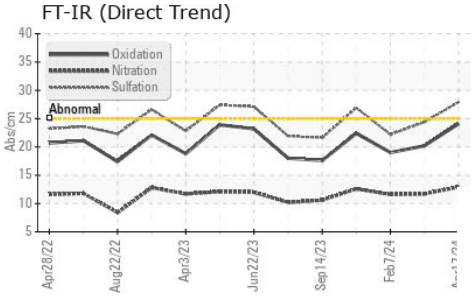
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **24.1** | 20.2 | 19.0 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | ▲ **3.0** | ▲ 3.9 | 4.3 |

# OIL ANALYSIS REPORT

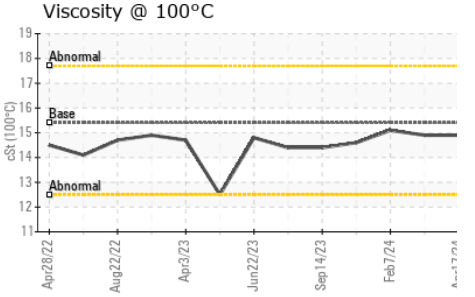
FT-IR (Direct Trend)




FT-IR (Direct Trend)




Viscosity @ 100°C

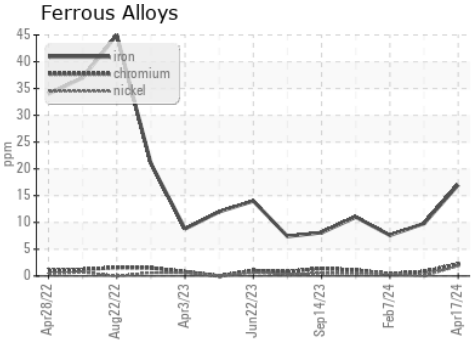



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

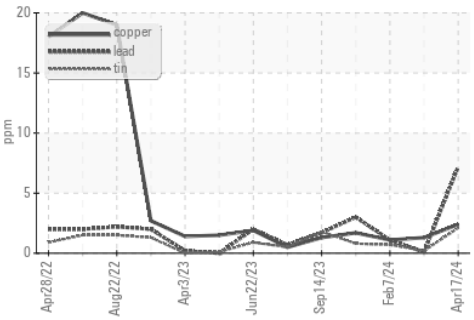
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **14.9** | 14.9 | 15.1 |

## GRAPHS

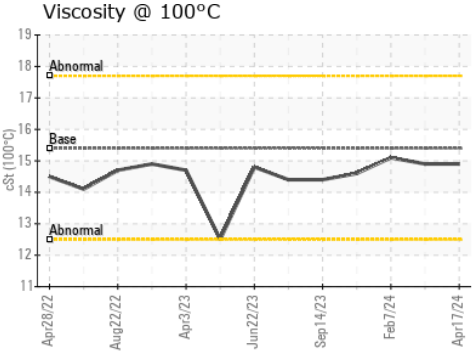
Ferrous Alloys



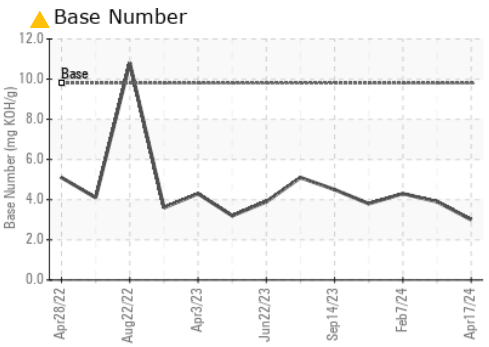

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0109605
**Lab Number** : 06152742
**Unique Number** : 10982820
**Test Package** : FLEET

**Received** : 18 Apr 2024
**Tested** : 18 Apr 2024
**Diagnosed** : 22 Apr 2024 - Don Baldridge

**GFL Environmental - 331 - Columbus**
180 Ada Moore Rd
Columbus, NC
US 28722
Contact: Matt Segars
matt.segars@gflenv.com
T: (800)207-6618
F: (252)617-2494

*To discuss this sample report, contact Customer Service at 1-800-237-1369.*
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*Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)*