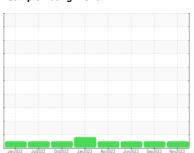


# **OIL ANALYSIS REPORT**

# Sample Rating Trend









Machine Id
727041
Component
Diesel Engine
Fluid

PETRO CANADA DURON SHP 15W40 (--- GAL)

# DIAGNOSIS

## Recommendation

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

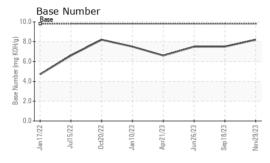
# **Fluid Condition**

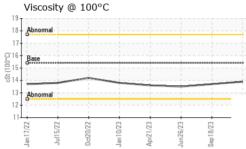
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| Sample Date   | OAMPLE INEC   | DMATION            |             | 11 14 11   |             |             |             |  |
|---|---|--------------------|-------------|------------|-------------|-------------|-------------|--|
| Sample Date   | SAMPLE INFO   | RMATION            | method      | limit/base | current     | history1    | history2    |  |
| Machine Age   hrs   Client Info   14236   13695   13044   | Sample Number   |                    | Client Info |            | GFL0096611  | GFL0091546  | GFL0082742  |  |
| Oil Age         hrs         Client Info         600         600         600         600           Oil Changed         Client Info         Changed         N/A         Changed           Sample Status         NORMAL         NORMAL <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>29 Nov 2023</th> <th>18 Sep 2023</th> <th>26 Jun 2023</th>  | Sample Date   |                    | Client Info |            | 29 Nov 2023 | 18 Sep 2023 | 26 Jun 2023 |  |
| Client Info   Changed N/A   NORMAL   NORMAL | Machine Age   | hrs                | Client Info |            | 14236       | 13695       | 13044       |  |
| NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2  | Oil Age   | hrs                | Client Info |            | 600         | 600         | 600         |  |
| CONTAMINATION   | Oil Changed   |                    | Client Info |            | Changed     | N/A         | Changed     |  |
| Fuel  | Sample Status   |                    |             |            | NORMAL      | NORMAL      | NORMAL      |  |
| Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         Imitibase         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >12.0         17         10         4           Chromium         ppm         ASTM D5185m         >2.0         <1         0         <1           Nickel         ppm         ASTM D5185m         >5         0         0         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >20         3         5         5           Lead         ppm         ASTM D5185m         >40         0         0         <1         <1           Copper         ppm         ASTM D5185m         >15         0         <1         <1         <1           Tin         ppm         ASTM D5185m         0   | CONTAMINA   | NOITA              | method      | limit/base | current     | history1    | history2    |  |
| WEAR METALS   | Fuel  |                    | WC Method   | >3.0       | <1.0        | <1.0        | <1.0        |  |
| WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         17         10         4           Chromium         ppm         ASTM D5185m         >20         <1   | Water   |                    | WC Method   | >0.2       | NEG         | NEG         | NEG         |  |
| Iron  | Glycol  |                    | WC Method   |            | NEG         | NEG         | NEG         |  |
| Chromium         ppm         ASTM D5185m         >20         <1   | WEAR META   | ALS                | method      | limit/base | current     | history1    | history2    |  |
| Nickel  | Iron  | ppm                | ASTM D5185m | >120       | 17          | 10          | 4           |  |
| Titanium         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         3         5         5           Lead         ppm         ASTM D5185m         >40         0         0         <1         <1           Copper         ppm         ASTM D5185m         >330         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <  | Chromium  | ppm                | ASTM D5185m | >20        | <1          | 0           | <1          |  |
| Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         3         5         5           Lead         ppm         ASTM D5185m         >40         0         0         <1         <1           Copper         ppm         ASTM D5185m         >15         0         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         2         2         3         3           Boron         ppm         ASTM D5185m         0         0         0         0         0         0           Barium         ppm         ASTM D5185m         0         2         2         2         3           Barium         ppm         ASTM D5185m         0         2         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0  | Nickel  | ppm                | ASTM D5185m | >5         | 0           | 0           | <1          |  |
| Aluminum         ppm         ASTM D5185m         >20         3         5         5           Lead         ppm         ASTM D5185m         >40         0         0         <1  | Titanium  | ppm                | ASTM D5185m | >2         | 0           | 0           | 0           |  |
| Lead         ppm         ASTM D5185m         >40         0         0         <1           Copper         ppm         ASTM D5185m         >330         <1         <1         <1           Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         2         3           Barium         ppm         ASTM D5185m         0         2         2         3           Barium         ppm         ASTM D5185m         0         2         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         1           Manganese         ppm         ASTM D5185m         0         0         0         0         1           Calcium         ppm         ASTM D5185m         100         1144 <td>Silver</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;2</td> <th>0</th> <td>0</td> <td>0</td>   | Silver  | ppm                | ASTM D5185m | >2         | 0           | 0           | 0           |  |
| Copper         ppm         ASTM D5185m         >330         <1         <1         <1         <1           Tin         ppm         ASTM D5185m         >15         0         <1  | Aluminum  | ppm                | ASTM D5185m | >20        | 3           | 5           | 5           |  |
| Tin   | Lead  | ppm                | ASTM D5185m | >40        | 0           | 0           | <1          |  |
| Tin         ppm         ASTM D5185m         >15         0         <1         <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         2         2         3           Barium         ppm         ASTM D5185m         0         2         0         0           Molybdenum         ppm         ASTM D5185m         0         2         0         0           Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         1144         961         891           Calcium         ppm         ASTM D5185m         1070         1346         1161         1089           Phosphorus         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         280  | Copper  |                    | ASTM D5185m | >330       | <1          | <1          | <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         2         2         3           Barium         ppm         ASTM D5185m         0         2         0         0           Molybdenum         ppm         ASTM D5185m         60         76         59         58           Manganese         ppm         ASTM D5185m         0         0         0         -1           Magnesium         ppm         ASTM D5185m         1010         1144         961         891           Calcium         ppm         ASTM D5185m         1070         1346         1161         1089           Phosphorus         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1<  |   |                    | ASTM D5185m | >15        | 0           | <1          | <1          |  |
| Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         2         3           Barium         ppm         ASTM D5185m         0         2         0         0           Molybdenum         ppm         ASTM D5185m         60         76         59         58           Manganese         ppm         ASTM D5185m         0         0         0         <1  | Vanadium  |                    | ASTM D5185m |            | 0           | 0           | 0           |  |
| Boron   | Cadmium   |                    |             |            | 0           |             | 0           |  |
| Barium         ppm         ASTM D5185m         0         2         0         0           Molybdenum         ppm         ASTM D5185m         60         76         59         58           Manganese         ppm         ASTM D5185m         0         0         0         <1  | ADDITIVES   |                    | method      | limit/base | current     | history1    | history2    |  |
| Molybdenum         ppm         ASTM D5185m         60         76         59         58           Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         1144         961         891           Calcium         ppm         ASTM D5185m         1070         1346         1161         1089           Phosphorus         ppm         ASTM D5185m         1150         1160         971         956           Zinc         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         5         0 <t< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>2</th><td>2</td><td>3</td></t<>  | Boron   | ppm                | ASTM D5185m | 0          | 2           | 2           | 3           |  |
| Manganese         ppm         ASTM D5185m         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         1144         961         891           Calcium         ppm         ASTM D5185m         1070         1346         1161         1089           Phosphorus         ppm         ASTM D5185m         1150         1160         971         956           Zinc         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         >20         5         -1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.4         0.2           Nitration         Abs/cm         *ASTM D7845         >30   | Barium  | ppm                | ASTM D5185m | 0          | 2           | 0           | 0           |  |
| Magnesium         ppm         ASTM D5185m         1010         1144         961         891           Calcium         ppm         ASTM D5185m         1070         1346         1161         1089           Phosphorus         ppm         ASTM D5185m         1150         1160         971         956           Zinc         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1   | Molybdenum  | ppm                | ASTM D5185m | 60         | 76          | 59          | 58          |  |
| Calcium         ppm         ASTM D5185m         1070         1346         1161         1089           Phosphorus         ppm         ASTM D5185m         1150         1160         971         956           Zinc         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1   | Manganese   | ppm                | ASTM D5185m | 0          | 0           | 0           | <1          |  |
| Phosphorus         ppm         ASTM D5185m         1150         1160         971         956           Zinc         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1   | Magnesium   | ppm                | ASTM D5185m | 1010       | 1144        | 961         | 891         |  |
| Zinc         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1  | Calcium   | ppm                | ASTM D5185m | 1070       | 1346        | 1161        | 1089        |  |
| Zinc         ppm         ASTM D5185m         1270         1507         1251         1218           Sulfur         ppm         ASTM D5185m         2060         4094         3212         2805           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1  | Phosphorus  | ppm                | ASTM D5185m | 1150       | 1160        | 971         | 956         |  |
| CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1  | Zinc  | ppm                | ASTM D5185m | 1270       | 1507        | 1251        | 1218        |  |
| Silicon         ppm         ASTM D5185m         >25         3         6         3           Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.4         8.3         7.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.5         19.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         15.4         15.4  | Sulfur  | ppm                | ASTM D5185m | 2060       | 4094        | 3212        | 2805        |  |
| Sodium         ppm         ASTM D5185m         5         6         2           Potassium         ppm         ASTM D5185m         >20         5         <1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.4         8.3         7.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.5         19.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         15.4         15.4  | CONTAMINA   | ANTS               | method      | limit/base | current     | history1    | history2    |  |
| Potassium         ppm         ASTM D5185m         >20         5         <1  | Silicon   | ppm                | ASTM D5185m | >25        | 3           | 6           | 3           |  |
| INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.4         8.3         7.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.5         19.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         15.4         15.4  | Sodium  | ppm                | ASTM D5185m |            | 5           | 6           | 2           |  |
| Soot %         %         *ASTM D7844 >4         0.5         0.4         0.2           Nitration         Abs/cm         *ASTM D7624 >20         8.4         8.3         7.1           Sulfation         Abs/.1mm         *ASTM D7415 >30         19.5         19.2         19.7           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.8         15.4         15.4  | Potassium   | ppm                | ASTM D5185m | >20        | 5           | <1          | 1           |  |
| Nitration         Abs/cm         *ASTM D7624         >20         8.4         8.3         7.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.5         19.2         19.7           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         15.4         15.4  | INFRA-RED   |                    | method      | limit/base | current     | history1    | history2    |  |
| Sulfation         Abs/.1mm         *ASTM D7415         >30         19.5         19.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         15.4         15.4   | Soot %  | %                  | *ASTM D7844 | >4         | 0.5         | 0.4         | 0.2         |  |
| FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.8     15.4     15.4   | Nitration   | Abs/cm             | *ASTM D7624 | >20        | 8.4         | 8.3         | 7.1         |  |
| Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.8</b> 15.4 15.4  | Sulfation   | Abs/.1mm           | *ASTM D7415 | >30        | 19.5        | 19.2        | 19.7        |  |
|   | FLUID DEGRADATION method limit/base current history1 history2 |                    |             |            |             |             |             |  |
|   | Oxidation   | Abs/.1mm           | *ASTM D7414 | >25        | 15.8        | 15.4        | 15.4        |  |
|   | Base Number (BN   | <b>J)</b> mg KOH/g | ASTM D2896  | 9.8        | 8.2         | 7.5         | 7.5         |  |



# **OIL ANALYSIS REPORT**

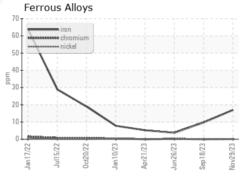


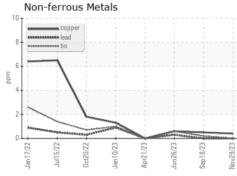


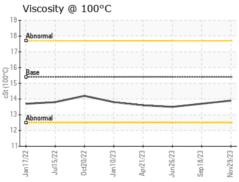
| VISUAL                  |        | method  | limit/base | current | history1 | history2 |
|-------------------------|--------|---------|------------|---------|----------|----------|
| White Metal             | scalar | *Visual | NONE       | NONE    | NONE     | NONE     |
| Yellow Metal            | 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    |
| <b>Emulsified Water</b> | scalar | *Visual | >0.2       | NEG     | NEG      | NEG      |
| Free Water              | scalar | *Visual |            | NEG     | NEG      | NEG      |

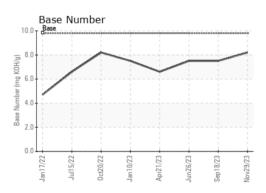
| FLUID PROPERTIES |     | method    |      |      |      | history2 |  |
|------------------|-----|-----------|------|------|------|----------|--|
| Visc @ 100°C     | cSt | ASTM D445 | 15.4 | 13.9 | 13.7 | 13.5     |  |

# **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number Test Package : FLEET

Unique Number : 10775896

: GFL0096611 : 06026105

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received Diagnosed

: 06 Dec 2023 : 07 Dec 2023 Diagnostician : Wes Davis

GFL Environmental - 465 - Pontiac

888 Baldwin Pontiac, MI US 48340

Contact: Ricky Matthews rickymathews@gflenv.com T: (586)825-9514

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)

Report Id: GFL465 [WUSCAR] 06026105 (Generated: 12/07/2023 04:41:20) Rev: 1