

## **OIL ANALYSIS REPORT**

Sample Rating Trend

<u>...............</u>

### NORMAL

#### Area (GGJ355) 3847 Component Diesel Engine Fluid PETRO CANADA DURON SHP 15W40 (11 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 INFORI   | MATION   | method  | limit/base   | current   | history1  | history2   |
|---|--|---|--|---|---|--|
| Sample Number   |  | Client Info   |  | GFL0072140  | GFL0072070  | GFL0072030   |
| Sample Date   |  | Client Info   |  | 10 Apr 2024   | 20 Mar 2024   | 02 Jan 2024  |
| Machine Age   | hrs  | Client Info   |  | 30726   | 30643   | 30060  |
| Oil Age   | hrs  | Client Info   |  | 695   | 600   | 600  |
| Oil Changed   |  | Client Info   |  | Changed   | Changed   | Changed  |
| Sample Status   |  |   |  | NORMAL  | NORMAL  | NORMAL   |
| CONTAMINAT  | ION  | 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 METAL  | S  | method  | limit/base   | current   | history1  | history2   |
| Iron  | ppm  | ASTM D5185m   | >165   | 2   | 8   | 8  |
| Chromium  | ppm  | ASTM D5185m   | >5   | 0   | 0   | <1   |
| Nickel  | ppm  | ASTM D5185m   | >4   | <1  | 0   | 0  |
| Titanium  | ppm  | ASTM D5185m   | >2   | 0   | 0   | <1   |
| Silver  | ppm  | ASTM D5185m   | >2   | 0   | 0   | 0  |
| Aluminum  | ppm  | ASTM D5185m   | >20  | 1   | <1  | 2  |
| Lead  | ppm  | ASTM D5185m   | >150   | <1  | <1  | <1   |
| Copper  | ppm  | ASTM D5185m   | >90  | 0   | <1  | 2  |
| Tin   | ppm  | ASTM D5185m   | >5   | <1  | 0   | <1   |
| Vanadium  | ppm  | ASTM D5185m   |  | 0   | 0   | 0  |
| Cadmium   | ppm  | ASTM D5185m   |  | 0   | 0   | 0  |
|   |  |   |  | Ū   | 0   | -  |
| ADDITIVES   |  | method  | limit/base   | current   | history1  | history2   |
| ADDITIVES<br>Boron  | ppm  | method<br>ASTM D5185m   | limit/base   | -   | -   | -  |
|   |  | ASTM D5185m   |  | current   | history1  | history2   |
| Boron   | ppm  | ASTM D5185m   | 0  | current<br>6  | history1<br>3   | history2<br>4  |
| Boron<br>Barium   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60   | current<br>6<br>0   | history1<br>3<br>0  | history2<br>4<br>0   |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60   | current<br>6<br>0<br>60   | history1<br>3<br>0<br>62  | history2<br>4<br>0<br>55   |
| Boron<br>Barium<br>Molybdenum<br>Manganese  | ppm<br>ppm<br>ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0  | current<br>6<br>0<br>60<br>0  | history1<br>3<br>0<br>62<br>0   | history2<br>4<br>0<br>55<br><1   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium   | ppm<br>ppm<br>ppm<br>ppm<br>ppm                                    | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010  | current<br>6<br>0<br>60<br>0<br>969   | history1<br>3<br>0<br>62<br>0<br>1008   | history2<br>4<br>0<br>55<br><1<br>819  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium  | ppm<br>ppm<br>ppm<br>ppm<br>ppm                                    | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070  | current     6     0     60     0     969     1067   | history1<br>3<br>0<br>62<br>0<br>1008<br>1189   | history2<br>4<br>0<br>55<br><1<br>819<br>923   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150  | current     6     0     60     0     969     1067     1090  | history1<br>3<br>0<br>62<br>0<br>1008<br>1189<br>1086   | history2<br>4<br>0<br>55<br><1<br>819<br>923<br>942  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270  | current     6     0     60     0     969     1067     1090     1282   | history1<br>3<br>0<br>62<br>0<br>1008<br>1189<br>1086<br>1314   | history2<br>4<br>0<br>55<br><1<br>819<br>923<br>942<br>1072  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060   | Current<br>6<br>0<br>60<br>0<br>969<br>1067<br>1090<br>1282<br>3865   | history1<br>3<br>0<br>62<br>0<br>1008<br>1189<br>1086<br>1314<br>3797   | history2<br>4<br>0<br>55<br><1<br>819<br>923<br>942<br>1072<br>2877  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm        | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060   | current     6     0     60     0     969     1067     1090     1282     3865     current  | history1<br>3<br>0<br>62<br>0<br>1008<br>1189<br>1086<br>1314<br>3797<br>history1   | history2<br>4<br>0<br>55<br><1<br>819<br>923<br>942<br>1072<br>2877<br>history2  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b><br>ASTM D5185m  | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>limit/base</b>  | current     6     0     60     0     969     1067     1090     1282     3865     current     4  | history1     3     0     62     0     1008     1189     1086     1314     3797     history1     5                         | history2   4   0   55   <1   819   923   942   1072   2877   history2   4  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b><br>ASTM D5185m  | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>limit/base</b>  | current     6     0     60     0     969     1067     1090     1282     3865     current     4     2  | history1     3     0     62     0     1008     1189     1086     1314     3797     history1     5     1                   | history2   4   0   55   <1   819   923   942   1072   2877   history2   4   0  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b><br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>imit/base</b><br>>35   | current     6     0     60     0     969     1067     1090     1282     3865     current     4     2     1                                      | history1     3     0     62     0     1008     1189     1086     1314     3797     history1     5     1     5     1     - | history2   4   0   55   <1   819   923   942   1072   2877   history2   4   0   2  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED                                     | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>Imit/base</b><br>>35<br>>20<br><b>Imit/base</b><br>>7.5              | current     6     0     60     0     969     1067     1090     1282     3865     current     4     2     1     current                          | history1   3   0   62   0   1008   1189   1086   1314   3797   history1   5   1      1         1      1      history1     | history2   4   0   55   <1   819   923   942   1072   2877   history2   4   0   2   history2                                       |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %                           | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m                               | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>Imit/base</b><br>>35<br>>20<br><b>Imit/base</b><br>>7.5              | current     6     0     60     0     969     1067     1090     1282     3865     current     4     2     1     current     0.1                  | history1   3   0   62   0   1008   1189   1086   1314   3797   history1   5   1   -   1   -   -   0.2                     | history2   4   0   55   <1   819   923   942   1072   2877   history2   4   0   2   history2   0   2.   history2   0.2             |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration              | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>imit/base<br>>35<br>>20<br>imit/base<br>>7.5<br>>20                     | current     6     0     60     0     969     1067     1090     1282     3865     current     4     2     1     current     0.1     5.1          | history1   3   0   62   0   1008   1189   1086   1314   3797   history1   5   1   -   -   -   0.2   5.9                   | history2   4   0   55   <1   819   923   942   1072   2877   history2   4   0   2   history2   0   2   0.2   5.9                   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration<br>Sulfation | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>imit/base</b><br>>35<br>20<br><b>imit/base</b><br>>7.5<br>>20<br>>30 | current     6     0     60     0     969     1067     1090     1282     3865     current     4     2     1     current     0.1     5.1     17.5 | history1   3   0   62   0   1008   1189   1086   1314   3797   history1   5   1   -   history1   0.2   5.9   17.9         | history2   4   0   55   <1   819   923   942   1072   2877   history2   4   0   2   history2   0   2   history2   0.2   5.9   17.7 |

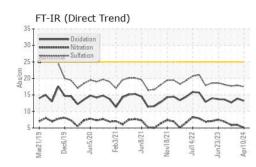


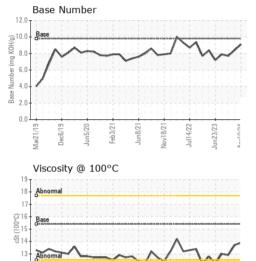
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# **OIL ANALYSIS REPORT**





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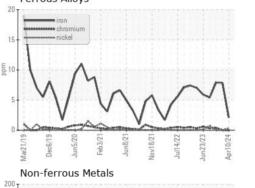
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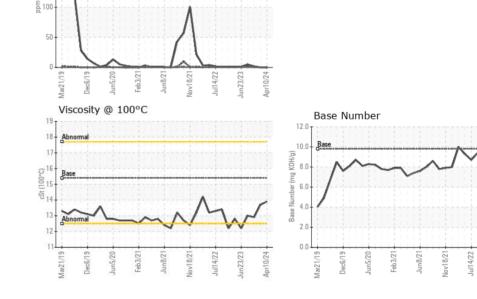
| VISUAL           |        | method    | limit/base | current | history1 | history2 |
|------------------|--------|-----------|------------|---------|----------|----------|
| White Metal      | scalar | *Visual   | NONE       | NONE    | NONE     | NONE     |
| Yellow Metal     | scalar | *Visual   | 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 PROPE      | RTIES  | method    | limit/base | current | history1 | history2 |
| Visc @ 100°C     | cSt    | ASTM D445 | 15.4       | 13.9    | 13.7     | 12.9     |
| GRAPHS           |        |           |            |         |          |          |

Ferrous Alloys

lead

150





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 095 - Atlanta West Sample No. : GFL0072140 Received : 11 Apr 2024 2699 Cochran Industrial Blvd Lab Number : 06146410 Tested : 12 Apr 2024 Douglasville, GA Unique Number : 10976488 Diagnosed : 12 Apr 2024 - Wes Davis US 30127-1332 Test Package : FLEET Contact: Darrell Welch Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. darrell.welch@gflenv.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (800)207-6618 

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: GFL095 [WUSCAR] 06146410 (Generated: 04/12/2024 16:55:50) Rev: 1

Submitted By: Darrell Welch

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