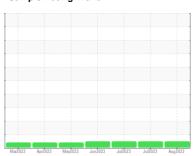


# **OIL ANALYSIS REPORT**

## Sample Rating Trend









Machine Id
413109
Component
Diesel Engine
Fluid

PETRO CANADA DURON SHP 15W40 (8 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

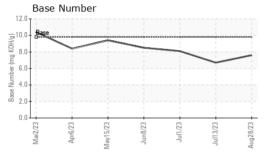
## **Fluid Condition**

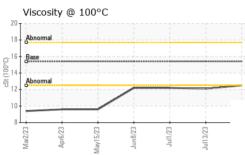
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| OAMBLE INCOR   | MATION   |  | 11 1-1   |   | 12   | 11.4   |
|--|--|--|--|---|--|--|
| SAMPLE INFORI  | MATION   | method   | limit/base   | current   | history1   | history2   |
| Sample Number  |  | Client Info  |  | GFL0091392  | GFL0086109   | GFL0086092   |
| Sample Date  |  | Client Info  |  | 28 Aug 2023   | 13 Jul 2023  | 01 Jul 2023  |
| Machine Age  | hrs  | Client Info  |  | 1126  | 818  | 668  |
| Oil Age  | hrs  | Client Info  |  | 169   | 818  | 668  |
| Oil Changed  |  | Client Info  |  | Not Changd  | Not Changd   | Not Changd   |
| Sample Status  |  |  |  | NORMAL  | NORMAL   | NORMAL   |
| CONTAMINAT   | ION  | method   | limit/base   | current   | history1   | history2   |
| Fuel   |  | WC Method  | >3.0   | <1.0  | <1.0   | <1.0   |
| Glycol   |  | WC Method  |  | NEG   | NEG  | NEG  |
| WEAR METAL   | S  | method   | limit/base   | current   | history1   | history2   |
| Iron   | ppm  | ASTM D5185m  | >120   | 6   | 17   | 15   |
| Chromium   | ppm  | ASTM D5185m  | >20  | <1  | <1   | <1   |
| Nickel   | ppm  | ASTM D5185m  | >5   | 0   | <1   | 1  |
| Titanium   | ppm  | ASTM D5185m  | >2   | 0   | 0  | <1   |
| Silver   | ppm  | ASTM D5185m  | >2   | <1  | <1   | <1   |
| Aluminum   | ppm  | ASTM D5185m  | >20  | 4   | 7  | 6  |
| Lead   | ppm  | ASTM D5185m  | >40  | 0   | 0  | <1   |
| Copper   | ppm  | ASTM D5185m  | >330   | 5   | 13   | 2  |
| Tin  | ppm  | ASTM D5185m  | >15  | <1  | <1   | 2  |
| Vanadium   | ppm  | ASTM D5185m  |  | 0   | 0  | 0  |
| Cadmium  | ppm  | ASTM D5185m  |  | 0   | 0  | 0  |
| A D D I T I V C O  |  |  | 12 24 /1   |   | la facilità de la constant   | la ! a l a m = 0   |
| ADDITIVES  |  | method   | limit/base   | current   | history1   | history2   |
| Boron  | ppm  | ASTM D5185m  | 0  | current<br>15   | 0  | 43   |
|  | ppm  |  |  |   |  |  |
| Boron  | • •  | ASTM D5185m  | 0  | 15  | 0  | 43   |
| Boron<br>Barium  | ppm  | ASTM D5185m<br>ASTM D5185m   | 0  | 15<br>0   | 0  | 43   |
| Boron<br>Barium<br>Molybdenum  | ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60   | 15<br>0<br>61   | 0<br>0<br>64   | 43<br>0<br>70  |
| Boron<br>Barium<br>Molybdenum<br>Manganese   | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0  | 15<br>0<br>61<br><1   | 0<br>0<br>64<br>2  | 43<br>0<br>70<br>2   |
| Boron Barium Molybdenum Manganese Magnesium  | 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  | 15<br>0<br>61<br><1<br>836  | 0<br>0<br>64<br>2<br>744   | 43<br>0<br>70<br>2<br>830  |
| Boron Barium Molybdenum Manganese Magnesium Calcium  | ppm<br>ppm<br>ppm<br>ppm   | 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  | 15<br>0<br>61<br><1<br>836<br>1087  | 0<br>0<br>64<br>2<br>744<br>1116   | 43<br>0<br>70<br>2<br>830<br>1177  |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus   | 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  | 15<br>0<br>61<br><1<br>836<br>1087<br>956   | 0<br>0<br>64<br>2<br>744<br>1116<br>870  | 43<br>0<br>70<br>2<br>830<br>1177<br>954   |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc  | 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   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184   | 0<br>0<br>64<br>2<br>744<br>1116<br>870<br>1086                                  | 43<br>0<br>70<br>2<br>830<br>1177<br>954<br>1171                                       |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur   | 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<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607   | 0<br>64<br>2<br>744<br>1116<br>870<br>1086<br>3182                               | 43<br>0<br>70<br>2<br>830<br>1177<br>954<br>1171<br>3569                               |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN  | 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<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current  | 0<br>0<br>64<br>2<br>744<br>1116<br>870<br>1086<br>3182<br>history1              | 43<br>0<br>70<br>2<br>830<br>1177<br>954<br>1171<br>3569<br>history2                   |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm        | ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current  | 0<br>0<br>64<br>2<br>744<br>1116<br>870<br>1086<br>3182<br>history1              | 43<br>0<br>70<br>2<br>830<br>1177<br>954<br>1171<br>3569<br>history2                   |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium   | ppm                            | ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current<br>4   | 0<br>0<br>64<br>2<br>744<br>1116<br>870<br>1086<br>3182<br>history1              | 43<br>0<br>70<br>2<br>830<br>1177<br>954<br>1171<br>3569<br>history2<br>13<br><1       |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium   | ppm                            | ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25   | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current<br>4<br>0<br>7   | 0<br>0<br>64<br>2<br>744<br>1116<br>870<br>1086<br>3182<br>history1<br>11<br><1  | 43<br>0<br>70<br>2<br>830<br>1177<br>954<br>1171<br>3569<br>history2<br>13<br><1       |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20<br>limit/base                                  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current<br>4<br>0<br>7   | 0 0 64 2 744 1116 870 1086 3182 history1 11 <1 20 history1                       | 43<br>0<br>70<br>2<br>830<br>1177<br>954<br>1171<br>3569<br>history2<br>13<br><1<br>14 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %                                  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m  method  *ASTM D5185m  ASTM D5185m ASTM D5185m  ASTM D5185m ASTM D5185m  ASTM D5185m  *ASTM D5185m                             | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20<br>limit/base                                  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current<br>4<br>0<br>7<br>current<br>0.1                           | 0 0 64 2 744 1116 870 1086 3182 history1 11 <1 20 history1 0.3                   | 43 0 70 2 830 1177 954 1171 3569 history2 13 <1 14 history2 0.2                        |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration                        | ppm                            | ASTM D5185m  Method  *ASTM D5185m ASTM D5185m                                  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20<br>limit/base                                  | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current<br>4<br>0<br>7<br>current<br>0.1<br>5.7                    | 0 0 64 2 744 1116 870 1086 3182 history1 11 <1 20 history1 0.3 8.6               | 43 0 70 2 830 1177 954 1171 3569 history2 13 <1 14 history2 0.2 7.9                    |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE | ppm                            | ASTM D5185m  Method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m  Method  *ASTM D7844  *ASTM D7844  *ASTM D7624  *ASTM D7415  Method  | 0<br>0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20<br>limit/base<br>>4<br>>20<br>>30<br>limit/base | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current<br>4<br>0<br>7<br>current<br>0.1<br>5.7<br>16.8<br>current | 0 0 64 2 744 1116 870 1086 3182 history1 11 <1 20 history1 0.3 8.6 19.1 history1 | 43 0 70 2 830 1177 954 1171 3569 history2 13 <1 14 history2 0.2 7.9 19.1 history2      |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation              | ppm                            | ASTM D5185m  Method ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415 | 0<br>0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20<br>limit/base<br>>4<br>>20<br>>30<br>limit/base | 15<br>0<br>61<br><1<br>836<br>1087<br>956<br>1184<br>3607<br>current<br>4<br>0<br>7<br>current<br>0.1<br>5.7<br>16.8            | 0 0 64 2 744 1116 870 1086 3182 history1 11 <1 20 history1 0.3 8.6 19.1          | 43 0 70 2 830 1177 954 1171 3569 history2 13 <1 14 history2 0.2 7.9 19.1               |



## **OIL ANALYSIS REPORT**

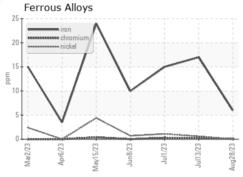


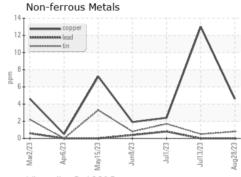


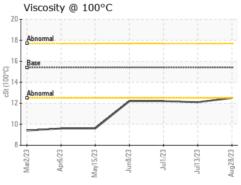
| VISUAL                  |        | method  | limit/base | current | history1 | history2 |
|-------------------------|--------|---------|------------|---------|----------|----------|
| White Metal             | scalar | *Visual | NONE       | NONE    | NONE     | NONE     |
| Yellow Metal          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

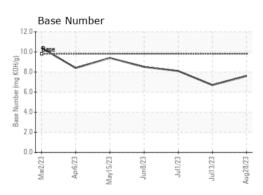
| FLUID PROPE  | ERTIES | method    |      |      |      | history2 |
|--------------|--------|-----------|------|------|------|----------|
| Visc @ 100°C | cSt    | ASTM D445 | 15.4 | 12.5 | 12.1 | 12.2     |

## **GRAPHS**













Certificate L2367

Laboratory Sample No.

Lab Number Unique Number : 10629199

: GFL0091392 : 05938587

Test Package : FLEET

To discuss this sample report, contact Customer Service at 1-800-237-1369.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 30 Aug 2023

Diagnosed : 31 Aug 2023 Diagnostician : Wes Davis

GFL Environmental - 010 - Stockbridge

1280 Rum Creek Parkway Stockbridge, GA US 30281

Contact: JOSHUA TINKER joshuatinker@gflenv.com

T:

\* - 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)

F: