

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# Machine Id 912057

#### 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.

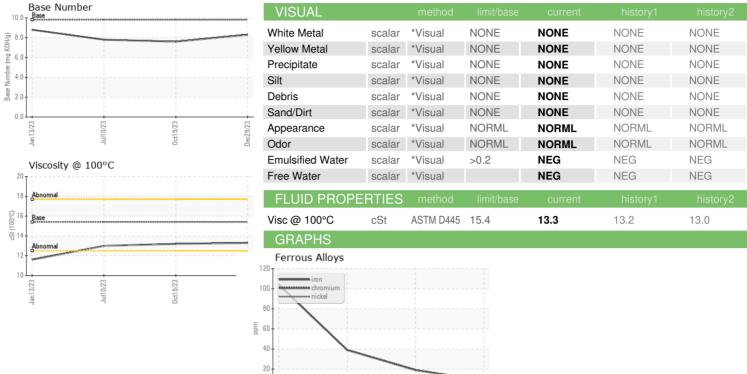
## Fluid Condition

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

| SAMPLE INFOR  |  | method   | limit/base  | current   | history1   | history2  |  |
|---|--|--|---|---|--|---|--|
|   | VIATION  |  | IIIIII/Dase   |   |  |   |  |
| Sample Number   |  | Client Info  |   | GFL0095371  | GFL0076939   | GFL0076930  |  |
| Sample Date   |  | Client Info  |   | 29 Dec 2023   | 19 Oct 2023  | 10 Jul 2023   |  |
| Machine Age   | hrs  | Client Info  |   | 1562  | 1175   | 596   |  |
| Oil Age   | hrs  | Client Info  |   | 397   | 579  | 466   |  |
| Oil Changed   |  | Client Info  |   | Changed   | Changed  | Changed   |  |
| Sample Status   |  |  |   | NORMAL  | NORMAL   | NORMAL  |  |
| CONTAMINAT  | ION  | 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 METAL  | S  | method   | limit/base  | current   | history1   | history2  |  |
| Iron  | ppm  | ASTM D5185m  | >110  | 8   | 19   | 39  |  |
| Chromium  | ppm  | ASTM D5185m  | >4  | 0   | <1   | <1  |  |
| Nickel  | ppm  | ASTM D5185m  | >2  | 0   | 0  | 0   |  |
| Titanium  | ppm  | ASTM D5185m  |   | 0   | 0  | 0   |  |
| Silver  | ppm  | ASTM D5185m  | >2  | 0   | 0  | 0   |  |
| Aluminum  | ppm  | ASTM D5185m  | >25   | 5   | 12   | 18  |  |
| Lead  | ppm  | ASTM D5185m  | >45   | 0   | 0  | 0   |  |
| Copper  | ppm  | ASTM D5185m  | >85   | 1   | 3  | 7   |  |
| Tin   | ppm  | ASTM D5185m  | >4  | <1  | <1   | <1  |  |
| Vanadium  | ppm  | ASTM D5185m  |   | 0   | 0  | 0   |  |
| Cadmium   | ppm  | ASTM D5185m  |   | 0   | 0  | 0   |  |
|   |  |  |   |   |  |   |  |
| ADDITIVES   |  | method   | limit/base  | current   | history1   | history2  |  |
| ADDITIVES<br>Boron  | ppm  | method<br>ASTM D5185m  | limit/base<br>0   | current<br>5  | history1<br>6  | history2<br>25  |  |
|   | ppm<br>ppm   |  |   |   |  |   |  |
| Boron   |  | ASTM D5185m  | 0   | 5   | 6  | 25  |  |
| Boron<br>Barium   | ppm  | ASTM D5185m<br>ASTM D5185m   | 0   | 5<br>0  | 6<br>0   | 25<br>0   |  |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60  | 5<br>0<br>55  | 6<br>0<br>61   | 25<br>0<br>68   |  |
| 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   | 5<br>0<br>55<br>0   | 6<br>0<br>61<br><1   | 25<br>0<br>68<br><1   |  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium   | 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   | 5<br>0<br>55<br>0<br>967  | 6<br>0<br>61<br><1<br>977  | 25<br>0<br>68<br><1<br>834  |  |
| 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   | 0<br>0<br>60<br>0<br>1010<br>1070   | 5<br>0<br>55<br>0<br>967<br>1122  | 6<br>0<br>61<br><1<br>977<br>1169  | 25<br>0<br>68<br><1<br>834<br>1147  |  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus  | 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   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150   | 5<br>0<br>55<br>0<br>967<br>1122<br>1036  | 6<br>0<br>61<br><1<br>977<br>1169<br>1053  | 25<br>0<br>68<br><1<br>834<br>1147<br>977   |  |
| 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  | 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   | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262  | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292  | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143   |  |
| 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  | 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   | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201  | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132  | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199   |  |
| 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                                   | 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  | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br>current   | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1  | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<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>TS                             | 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<br><b>limit/base</b>  | 5<br>0<br>555<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br><i>current</i><br>2  | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4   | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>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>TS                             | 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<br><b>limit/base</b>  | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br>current<br>2<br>2<br><1   | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4<br>1  | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>4<br>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>TS                             | ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>limit/base</b><br>>30                                 | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br>current<br>2<br>2<br><1<br>11                                   | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4<br>1<br>34  | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>4<br>0<br>35   |  |
| 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>TS<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>>30<br>>20                                 | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br>current<br>2<br><1<br>11<br>11<br>current                       | 6<br>0<br>61<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4<br>1<br>34<br>history1  | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>4<br>0<br>35<br>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>TS<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>limit/base<br>>30<br>limit/base<br>>20                         | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br>current<br>2<br>2<br><1<br>11<br>11<br>current<br>0.2           | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4<br>1<br>34<br>history1<br>0.3                                       | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>4<br>0<br>35<br>history2<br>0.3                            |  |
| 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>>30<br>220<br>imit/base<br>>3<br>>20              | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br><i>current</i><br>2<br><1<br>11<br><i>current</i><br>0.2<br>7.1 | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4<br>1<br>34<br>history1<br>0.3<br>7.8                                | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>4<br>0<br>35<br>history2<br>0.3<br>7.9                     |  |
| 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>TS<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D7844<br>*ASTM D7624 | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>2060<br>2060<br>2060<br>200<br>200<br>200<br>200<br>20         | 5<br>0<br>555<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br>Current<br>2<br><1<br>11<br>0.2<br>7.1<br>18.8<br>Current      | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4<br>1<br>34<br>1<br>34<br>history1<br>0.3<br>7.8<br>19.0<br>history1 | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>4<br>0<br>35<br>history2<br>0.3<br>7.9<br>20.1<br>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 %<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>>30<br>20<br><b>Imit/base</b><br>>3<br>>20 | 5<br>0<br>55<br>0<br>967<br>1122<br>1036<br>1262<br>3201<br>current<br>2<br><1<br>11<br>11<br>0.2<br>7.1<br>18.8            | 6<br>0<br>61<br><1<br>977<br>1169<br>1053<br>1292<br>3132<br>history1<br>4<br>1<br>34<br><u>history1</u><br>0.3<br>7.8<br>19.0                 | 25<br>0<br>68<br><1<br>834<br>1147<br>977<br>1143<br>3199<br>history2<br>4<br>0<br>35<br>history2<br>0.3<br>7.9<br>20.1             |  |



# **OIL ANALYSIS REPORT**



|                |   | VI  | SUAL  |         | method                                 | limit/base             | e currer  | it nis   | story1                         | history2   |
|----------------|---|---|---|---------|--|------------------------|-----------|----------|--------------------------------|------------|
|                |   | Whit  | te Metal  | scalar  | *Visual                                | NONE                   | NONE      | NO       | ١E                             | NONE       |
|                |   | Yello   | ow Metal  | scalar  | *Visual                                | NONE                   | NONE      | NON      | ١E                             | NONE       |
|                |   |   | pitate  | scalar  | *Visual                                | NONE                   | NONE      | NO       |                                | NONE       |
|                |   | Silt  |   | scalar  | *Visual                                | NONE                   | NONE      | NON      | ١E                             | NONE       |
|                | <br> <br>   | Deb   | ris   | scalar  | *Visual                                | NONE                   | NONE      | NO       |                                | NONE       |
|                |   | d/Dirt  | scalar  | *Visual | NONE                                   | NONE                   | NO        |          | NONE                           |            |
| 500            | 1/23 -  |   | earance   | scalar  | *Visual                                | NORML                  | NORML     |          |                                | NORML      |
|                | Uct19/23 -  | Odo   |   | scalar  | *Visual                                | NORML                  | NORML     |          |                                | NORML      |
|                |   |   | Ilsified Water  | scalar  | *Visual                                | >0.2                   | NEG       | . NEC    |                                | NEG        |
|                |   |   | Water   | scalar  | *Visual                                | 20.L                   | NEG       | NEC      |                                | NEG        |
|                |   |   |   |         |  |                        |           |          |                                |            |
|                |   |   | LUID PROPE  |         | method                                 | limit/base             |           |          | story1                         | history2   |
| *******        |   |   | @ 100°C   | cSt     | ASTM D445                              | 15.4                   | 13.3      | 13.2     | )<br>-                         | 13.0       |
|                |   |   | RAPHS   |         |  |                        |           |          |                                |            |
|                |   | Fei<br>120 T  | rrous Alloys  |         |  |                        |           |          |                                |            |
| ŝ              |   | 100-  | iron<br>chromium  |         |  |                        |           |          |                                |            |
|                | uct19/23 .  |   | nickel  |         |  |                        |           |          |                                |            |
|                |   | 80 -  |   |         |  |                        |           |          |                                |            |
|                |   | 튭 60  |   |         |  |                        |           |          |                                |            |
|                |   | 40  |   |         |  |                        |           |          |                                |            |
|                |   |   |   |         |  |                        |           |          |                                |            |
|                |   | 20-   |   |         |  |                        |           |          |                                |            |
|                |   | و لي  |   |         | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |                        |           |          |                                |            |
|                |   | Jan 13/23   | Jul10/23  |         | 0ct19/23                               | Dec29/23               |           |          |                                |            |
|                |   | ,   | -   |         | 00                                     | Der                    |           |          |                                |            |
|                |   |   | n-ferrous Meta  | ls      |  |                        |           |          |                                |            |
|                |   | $^{18}_{16}$  | copper  |         |  |                        |           |          |                                |            |
|                |   | 14  | www.www.iead  |         |  |                        |           |          |                                |            |
|                |   | 12-   |   |         |  |                        |           |          |                                |            |
|                |   | E 10  |   |         |  |                        |           |          |                                |            |
|                |   | 1 8-  |   |         |  |                        |           |          |                                |            |
|                |   | 6   |   |         |  |                        |           |          |                                |            |
|                |   | 2   |   |         |  | 1                      |           |          |                                |            |
|                |   | 0   | Low-section with the section of the |         |  |                        |           |          |                                |            |
|                |   | ,<br>Jan 13/23 -  | Jul10/23  |         | 0ct19/23 -                             | Dec29/23 -             |           |          |                                |            |
|                |   | Jan 1   | Jul   |         | 0ct1                                   | Dec2                   |           |          |                                |            |
|                |   |   | scosity @ 100°  | С       |  |                        | Base Nur  | nher     |                                |            |
|                |   | 19<br>18 Abr  | normal  |         |  | 1                      | 10.0 Base |          |                                |            |
|                |   | 17  |   |         |  |                        | 8.0       |          |                                |            |
|                |   | 16 - Bas  | 54  |         |  | (B/HO                  |           |          |                                |            |
|                |   |   |   |         |  | mg K                   | 6.0-      |          |                                |            |
|                |   | ()<br>0015<br>15<br>14  |   |         |  | Base Number (mg KOH/g) | 4.0       |          |                                |            |
|                |   | 13 Abr  | normal  |         |  | se Nur                 | T.U       |          |                                |            |
|                |   | 12  |   |         |  |                        | 2.0       |          |                                |            |
|                |   | 11  |   |         |  |                        |           |          |                                |            |
|                |   | 10  | (23   |         | - /23                                  |                        | 0.0       | /23 -    | /23                            |            |
|                |   | Jan 13/23   | Jul10/23  |         | 0ct19/23                               | Dec29/23               | Jan 13/23 | Jul10/23 | 0ct19/23                       |            |
|                | Laboratory<br>Sample No.<br>Lab Number<br>Unique Number | : WearCheck USA - 501 Madison Ave., Cary, NC 27513<br>: GFL0095371 Recieved : 02 Jan 2024<br>: 06049413 Diagnosed : 04 Jan 2024<br>rr : 10810021 Diagnostician : Wes Davis<br>e : FLEET Contact: Kirk |   |         |  |                        |           |          | Deleglise<br>Antigo,<br>US 544 |            |
| tificate L2367 | Test Package<br>is sample report,                       |   |   |         |  |                        |           |          |                                | @gflenv.co |

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Submitted By: see also GFL927, GFL930 - Kirk Koss