

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend



## Machine Id 920067

#### 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.

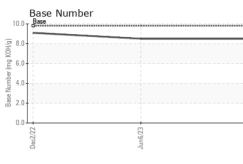
## Fluid Condition

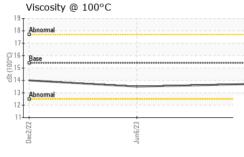
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| SAMPLE INFORI   | MATION   | method  | limit/base  | current   | history1  | history2  |
|---|--|---|---|---|---|---|
| Sample Number   |  | Client Info   |   | GFL0086740  | GFL0071279  | GFL0065041  |
| Sample Date   |  | Client Info   |   | 26 Oct 2023   | 06 Jun 2023   | 02 Dec 2022   |
| Machine Age   | hrs  | Client Info   |   | 8144  | 7020  | 5767  |
| Oil Age   | hrs  | Client Info   |   | 8144  | 7020  | 5767  |
| Oil Changed   |  | Client Info   |   | Changed   | Not Changd  | Not Changd  |
| Sample Status   |  |   |   | NORMAL  | NORMAL  | NORMAL  |
| CONTAMINAT  | ION  | method  | limit/base  | current   | history1  | history2  |
| Fuel  |  | WC Method   | >5  | <1.0  | <1.0  | <1.0  |
| Glycol  |  | WC Method   |   | NEG   | NEG   | NEG   |
| WEAR METALS   |  | method  | limit/base  | current   | history1  | history2  |
| Iron  | ppm  | ASTM D5185m   | >110  | 9   | 11  | 3   |
| Chromium  | ppm  | ASTM D5185m   | >4  | <1  | <1  | <1  |
| Nickel  | ppm  | ASTM D5185m   | >2  | 0   | 0   | 0   |
| Titanium  | ppm  | ASTM D5185m   |   | <1  | 0   | 0   |
| Silver  | ppm  | ASTM D5185m   | >2  | 0   | 0   | 0   |
| Aluminum  | ppm  | ASTM D5185m   | >25   | 3   | 8   | <1  |
| Lead  | ppm  | ASTM D5185m   | >45   | 0   | 0   | 0   |
| Copper  | ppm  | ASTM D5185m   | >85   | <1  | <1  | <1  |
| Tin   | ppm  | ASTM D5185m   | >4  | <1  | 0   | 0   |
| Vanadium  | ppm  | ASTM D5185m   |   | 0   | 0   | 0   |
| Cadmium   | ppm  | ASTM D5185m   |   | 0   | 0   | 0   |
| ADDITIVES   |  | and a first of  |   |   | In the tax work   | biotory 0   |
|   |  | method  | limit/base  | current   | nistory i   | TIISTOLAS   |
| Boron   | mqq  | method<br>ASTM D5185m   | limit/base  | current<br>0  | history1<br>0   | history2<br>94  |
|   | ppm<br>mag   | ASTM D5185m   |   | 0   |   |   |
| Boron<br>Barium   | ppm  |   | 0   |   | 0   | 94  |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m  | 0   | 0<br>0  | 0   | 94<br>2   |
| Boron<br>Barium   | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60  | 0<br>0<br>63  | 0<br>0<br>63  | 94<br>2<br>60   |
| 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  | 0<br>0<br>60<br>0   | 0<br>0<br>63<br><1  | 0<br>0<br>63<br><1  | 94<br>2<br>60<br><1   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>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   | 0<br>0<br>63<br><1<br>996   | 0<br>0<br>63<br><1<br>1003  | 94<br>2<br>60<br><1<br>917  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium  | 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   | 0<br>0<br>63<br><1<br>996<br>1114   | 0<br>0<br>63<br><1<br>1003<br>1124  | 94<br>2<br>60<br><1<br>917<br>1093  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>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  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150   | 0<br>0<br>63<br><1<br>996<br>1114<br>1110   | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062  | 94<br>2<br>60<br><1<br>917<br>1093<br>1023  |
| 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   | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315   | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289  | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215  |
| 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<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060   | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876   | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666  | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621  |
| 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<br>ASTM D5185m   | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060  | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br>current  | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1  | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<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><b>method</b><br>ASTM D5185m  | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060  | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br>current<br>3   | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3   | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2   |
| 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><b>method</b><br>ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>Limit/base<br>>30                                  | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br>current<br>3<br>1  | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3<br>2  | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2<br>2<br><1  |
| 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                           | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br>current<br>3<br>1<br>2   | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3<br>2<br>1   | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2<br>2<br><1<br>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>TS               | ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br><b>limit/base</b><br>>20<br><b>limit/base</b>            | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br><u>current</u><br>3<br>1<br>2<br>2<br>2<br><u>current</u><br>0.5                             | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3<br>2<br>1<br>3<br>1<br>history1<br>0.5                          | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2<br>2<br><1<br>2<br>2<br><1<br>2<br>1<br>2<br>history2<br>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 %                           | 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>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>30<br>>20<br>limit/base<br>>33      | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br>current<br>3<br>1<br>2<br>2<br>current   | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3<br>2<br>1<br>1<br>history1                                      | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2<br><1<br>2<br><1<br>2<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              | 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        | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br><i>current</i><br>3<br>1<br>2<br>2<br><i>current</i><br>0.5<br>7.6                           | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3<br>2<br>1<br>3<br>2<br>1<br>history1<br>0.5<br>8.1              | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2<br><1<br>2<br>history2<br>0.2<br>5.8                                |
| 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><b>imit/base</b><br>>3<br>>20 | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br><u>current</u><br>3<br>1<br>2<br>2<br><u>current</u><br>0.5<br>7.6<br>19.5                   | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3<br>2<br>1<br>1<br>0.5<br>8.1<br>19.2                            | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2<br><1<br>2<br>history2<br>0.2<br>5.8<br>17.8                        |
| 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 D7844<br>*ASTM D7844 | 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   | 0<br>0<br>63<br><1<br>996<br>1114<br>1110<br>1315<br>2876<br><i>current</i><br>3<br>1<br>2<br>2<br><i>current</i><br>0.5<br>7.6<br>19.5<br><i>current</i> | 0<br>0<br>63<br><1<br>1003<br>1124<br>1062<br>1289<br>3666<br>history1<br>3<br>2<br>1<br>3<br>2<br>1<br>1<br>0.5<br>8.1<br>19.2<br>history1 | 94<br>2<br>60<br><1<br>917<br>1093<br>1023<br>1215<br>3621<br>history2<br>2<br><1<br>2<br><1<br>2<br>history2<br>0.2<br>5.8<br>17.8<br>history2 |



# **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  |
| 6/23                                      | Appearance                                  | scalar  | *Visual           | NORML                 | NORML       | NORML            | NORML   |
| 0ct26/23                                  | 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                                 | ERTIES  | method            | limit/base            | current     | history1         | history2  |
|   | Visc @ 100°C                                | cSt     | ASTM D445         | 15.4                  | 13.7        | 13.5             | 14.0  |
|   | GRAPHS                                      |         |                   |                       |             |                  |   |
|   | Ferrous Alloys                              |         |                   |                       |             |                  |   |
|   | iron  | ~       | -                 |                       |             |                  |   |
|   | 10- nickel                                  |         |                   |                       |             |                  |   |
|   | 8   |         |                   |                       |             |                  |   |
|   | E 6   |         |                   |                       |             |                  |   |
|   |   |         |                   |                       |             |                  |   |
|   |   |         |                   |                       |             |                  |   |
|   | 2   |         |                   |                       |             |                  |   |
|   | 0<br>2                                      | 23      | ***************** | 53                    |             |                  |   |
|   | Dec2/22                                     | Jun6/23 |                   | 0ct26/23              |             |                  |   |
|   | –<br>Non-ferrous Meta                       |         |                   | 0                     |             |                  |   |
|   | <sup>10</sup> T                             |         |                   |                       |             |                  |   |
|   | copper                                      |         |                   |                       |             |                  |   |
|   | 8 - energenergenergenergenergenergenergener |         |                   |                       |             |                  |   |
|   | 6-  |         |                   |                       |             |                  |   |
|   | шd  |         |                   |                       |             |                  |   |
|   | 4   |         |                   |                       |             |                  |   |
|   | 2-  |         |                   |                       |             |                  |   |
|   |   |         |                   |                       |             |                  |   |
|   | 1227  | 3/23    |                   | 3/23                  |             |                  |   |
|   | Dec2/22                                     | Jun6/23 |                   | 0ct26/23              |             |                  |   |
|   | Viscosity @ 100°                            | C       |                   |                       | Dees Norsha | _                |   |
|   | <sup>19</sup>                               |         |                   | 10.                   | Base Number |                  |   |
|   | 18 - Abnormal                               |         |                   |                       |             |                  |   |
|   | 17  |         |                   | (B/H                  | .0 +        |                  |   |
| i   | Co <sup>16</sup> Base<br>00 15<br>35 14     |         |                   | рания<br>1940 г. – С. | .0          |                  |   |
|   | ē15-  |         |                   | ber (n                |             |                  |   |
|   | 5   |         |                   |                       | 0.1         |                  |   |
|   |   |         |                   | 4.                    | .0          |                  |   |
|   | 13 - Abnormal                               |         |                   | (0)HOX Dw) Jaquing 4. |             |                  |   |
|   | 10  |         |                   |                       | .0-         |                  |   |
|   | 13 - Abnormal<br>12 -                       | 23      |                   |                       | 0           | 23               |   |
|   | 13 - Abnormal                               | Jun6/23 |                   |                       | .0-         | Jun6/23          |   |
| oratory<br>ple No.<br>Number<br>ue Number | 13 - Abnormal<br>12 -                       |         | d :10<br>ed :10   | .0<br>0ct56/23        | Dec2/22     | vironmental - 93 | <b>2 - Muskego H</b><br>400 College (<br>Muskego, V<br>US 531 |

 Certificate L2367
 Test Package
 : FLEET

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

 \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.
 b

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

