

## **OIL ANALYSIS REPORT**

Sample Rating Trend

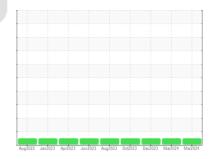




4625M Component Diesel Engine Fluid

# PETRO CANADA DURON SHP 15W40 (5 GAL)

SAMPLE INFORMATION method





DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

Machine Id

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

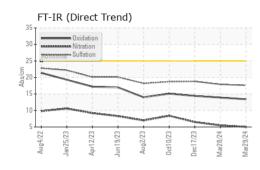
### Fluid Condition

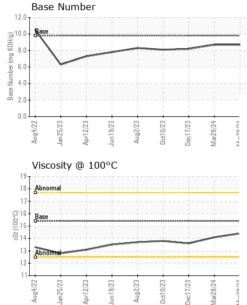
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| Sample Number  |   | Client Info  |   | GFL0115082  | GFL0115085  | GFL0097734  |
|--|---|--|---|---|---|---|
| Sample Date  |   | Client Info  |   | 29 Mar 2024   | 28 Mar 2024   | 17 Dec 2023   |
| Machine Age  | hrs   | Client Info  |   | 21883   | 21971   | 21373   |
| Oil Age  | hrs   | Client Info  |   | 510   | 599   | 627   |
| Oil Changed  |   | Client Info  |   | Changed   | Not Changd  | Changed   |
| Sample Status  |   |  |   | NORMAL  | NORMAL  | NORMAL  |
|  | <u></u>   |  |   |   |   |   |
| CONTAMINATI  | ON  | 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 METALS  | S   | method   | limit/base  | current   | history1  | history2  |
|  |   |  |   |   |   |   |
| Iron   | ppm   | ASTM D5185m  | >90   | 4   | 10  | 7   |
| Chromium   | ppm   | ASTM D5185m  | >20   | <1  | <1  | <1  |
| Nickel   | ppm   | ASTM D5185m  | >2  | 0   | 0   | 0   |
| Titanium   | ppm   | ASTM D5185m  | >2  | <1  | 0   | 0   |
| Silver   | ppm   | ASTM D5185m  | >2  | 0   | 0   | 0   |
| Aluminum   | ppm   | ASTM D5185m  | >20   | 2   | 1   | 1   |
| Lead   | ppm   | ASTM D5185m  | >40   | 0   | 0   | 0   |
| Copper   | ppm   | ASTM D5185m  | >330  | <1  | 0   | <1  |
| Tin  | ppm   | ASTM D5185m  | >15   | <1  | <1  | 0   |
| Vanadium   | ppm   | ASTM D5185m  |   | <1  | 0   | <1  |
| Cadmium  | ppm   | ASTM D5185m  |   | 0   | 0   | 0   |
| ADDITIVES  |   |  |   |   |   |   |
| ADDITIVES  |   | method   |   |   |   | history2  |
| Boron  | maa   | ASTM D5185m  |   |   |   | history2<br>2   |
| Boron  | ppm<br>ppm  | ASTM D5185m  | 0   | <1  | 2   | 2   |
| Boron<br>Barium  | ppm   | ASTM D5185m<br>ASTM D5185m   | 0   | <1<br>0   | 2<br>0  | 2<br>0  |
| Boron<br>Barium<br>Molybdenum  | ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60  | <1<br>0<br>57   | 2<br>0<br>57  | 2<br>0<br>52  |
| 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   | <1<br>0<br>57<br>0  | 2<br>0<br>57<br><1  | 2<br>0<br>52<br>0   |
| 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   | <1<br>0<br>57<br>0<br>875   | 2<br>0<br>57<br><1<br>947   | 2<br>0<br>52<br>0<br>853  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>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   | <1<br>0<br>57<br>0<br>875<br>1016   | 2<br>0<br>57<br><1<br>947<br>1021   | 2<br>0<br>52<br>0<br>853<br>975   |
| 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   | <1<br>0<br>57<br>0<br>875<br>1016<br>952  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030   | 2<br>0<br>52<br>0<br>853<br>975<br>1003   |
| 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  | 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   | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239   | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190   |
| 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   | <1<br>0<br>57<br>0<br>875<br>1016<br>952  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433   | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894   |
| 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   | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239   | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190   |
| 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   | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433   | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN   | 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  | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033<br>current   | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1   | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon  | 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>  | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060  | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033<br>current<br>4  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3  | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium  | 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>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>kimit/base<br>>25  | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033<br>current<br>4<br>19  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>1   | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3<br>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   | ppm   | 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>>25<br>>20  | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033<br>current<br>4<br>19<br>2   | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>1<br><1   | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3<br>8<br>8<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<br>INFRA-RED<br>Soot %  | 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>>25<br>>20<br>limit/base   | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033<br>current<br>4<br>19<br>2<br>2<br>current<br>0.1                              | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>1<br><1<br><1<br>history1<br>0.1                        | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3<br>8<br>0<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 %<br>Nitration   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br><b>TS</b><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>2060<br>225<br>225<br>220<br>imit/base<br>>20  | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033<br>current<br>4<br>19<br>2<br>current<br>0.1<br>5.0                            | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>3<br>1<br><1<br><1<br>history1<br>0.1<br>5.5            | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3<br>8<br>0<br>0<br>history2<br>0.2<br>6.5                             |
| 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>t<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>2060<br>225<br>20<br>225<br>20<br><b>imit/base</b><br>>6<br>>20<br>20                      | <1<br>0<br>57<br>0<br>875<br>1016<br>952<br>1128<br>3033<br><u>current</u><br>4<br>19<br>2<br>2<br><u>current</u><br>0.1<br>5.0<br>17.6 | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>3<br>1<br><1<br><1<br>0.1<br>5.5<br>17.9                | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br><b>history2</b><br>3<br>8<br>0<br><b>history2</b><br>0.2<br>6.5<br>18.8            |
| 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<br>FLUID DEGRAD              | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br><b>TS</b><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>225<br>20<br>220<br>220<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>2 | <1 0 57 0 875 1016 952 1128 3033 Current 4 19 2 Current 0.1 5.0 17.6 Current  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>1<br><1<br>5.5<br>17.9<br>history1                      | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3<br>8<br>0<br>0<br>history2<br>0.2<br>6.5<br>18.8<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<br>FLUID DEGRAD<br>Oxidation | 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 D7624<br>*ASTM D7415                | 0<br>0<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>2060<br>225<br>20<br>225<br>20<br><b>imit/base</b><br>>6<br>>20<br>20                      | <1 0 57 0 875 1016 952 1128 3033 current 4 19 2 current 0.1 5.0 17.6 current 13.4   | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>1<br><1<br><1<br>0.1<br>5.5<br>17.9<br>history1<br>13.9 | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3<br>8<br>0<br>0<br>history2<br>0.2<br>6.5<br>18.8<br>history2<br>14.4 |
| 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<br>FLUID DEGRAD              | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br><b>TS</b><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>225<br>20<br>220<br>220<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>2 | <1 0 57 0 875 1016 952 1128 3033 Current 4 19 2 Current 0.1 5.0 17.6 Current  | 2<br>0<br>57<br><1<br>947<br>1021<br>1030<br>1239<br>3433<br>history1<br>3<br>1<br><1<br>5.5<br>17.9<br>history1                      | 2<br>0<br>52<br>0<br>853<br>975<br>1003<br>1190<br>2894<br>history2<br>3<br>8<br>0<br>0<br>history2<br>0.2<br>6.5<br>18.8<br>history2         |



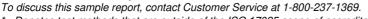
## **OIL ANALYSIS REPORT**





| 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     |
| 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       | 14.4    | 14.1     | 13.6     |
| GRAPHS           |        |           |            |         |          |          |

Ferrous Alloys 50 40 30 20 10 Π. Aug4/22 Jun19/23 Apr12/23 lec17/23 Mar28/24 Aar29/74 Aug2/23 Non-ferrous Metals lead ppm Aug4/22. un19/23 lar28/2 Aar29/7-Viscosity @ 100°C Base Number 19 12.0 18 10. 17 Base Number (mg KOH/g) ()-16 ()-00 () 15 () 14 8 ( B 6.0 4.0 13 Al 2 ( 12 11-0.0 Mar29/24 -Aug4/22 -Aug4/22 Jun19/23 Aug2/23 Aug2/23 Mar29/24 Jan25/23 Apr12/23 Dec17/23 Mar28/24 Jan25/23 Apr12/23 Dec17/23 Mar28/24 Jun 19/23 : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Laboratory GFL Environmental - 405 - Arbor Hills Sample No. : GFL0115082 Received 7811 Chubb Rd : 04 Apr 2024 NORTHVILLE, MI Lab Number : 06138310 Tested : 04 Apr 2024 Unique Number : 10963118 Diagnosed : 04 Apr 2024 - Wes Davis US 48168 Test Package : FLEET Contact: John Nahal jnahal@gflenv.com



\* - 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)

Т:

F:

Certificate L2367