

Area (DZ8297)

DIAGNOSIS

11106 Component Diesel Engine

Fluid

## **OIL ANALYSIS REPORT**

SAMPLE INFORMATION method

Sample Rating Trend

## NORMAL



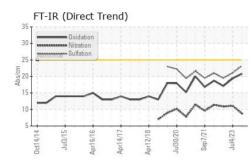
~ ... . . Recommendation ç Resample at the next service interval to monitor. Wear All component wear rates are normal. ( ( Contamination Ş There is no indication of any contamination in the oil. Fluid Condition The BN result indicates that there is suitable 1 alkalinity remaining in the oil. The condition of the oil is suitable for further service. ( (

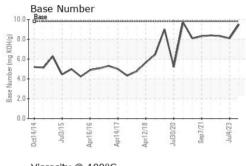
PETRO CANADA DURON SHP 15W40 (10 GAL)

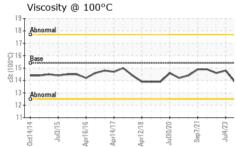
| Sample Number   |  | Client Info  |  | GFL0123352  | GFL0082409   | GFL0050754  |
|---|--|--|--|---|--|---|
| Sample Date   |  | Client Info  |  | 16 Jul 2024   | 04 Jul 2023  | 06 Jan 2023   |
| Machine Age   | mls  | Client Info  |  | 133290  | 133290   | 124154  |
| Oil Age   | mls  | Client Info  |  | 133290  | 9136   | 8386  |
| Oil Changed   |  | Client Info  |  | N/A   | 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  | >100   | 36  | 44   | 35  |
| Chromium  | ppm  | ASTM D5185m  | >20  | 2   | 2  | 2   |
| Nickel  | ppm  | ASTM D5185m  | >4   | 0   | 0  | 0   |
| Titanium  | ppm  | ASTM D5185m  |  | 0   | 0  | 0   |
| Silver  | ppm  | ASTM D5185m  | >3   | 0   | 0  | 0   |
| Aluminum  | ppm  | ASTM D5185m  | >20  | 4   | 4  | 4   |
| Lead  | ppm  | ASTM D5185m  | >40  | 2   | 5  | 4   |
| Copper  | ppm  | ASTM D5185m  | >330   | 6   | 4  | 3   |
| Tin   | ppm  | ASTM D5185m  | >15  | <1  | 2  | 1   |
| Vanadium  | ppm  | ASTM D5185m  |  | 0   | <1   | 0   |
| Cadmium   | ppm  | ASTM D5185m  |  | 0   | 0  | 0   |
| ADDITIVES   |  | method   | limit/base   | current   | history1   | history2  |
| //BBHHVE0   |  | mothod   | mmbase   |   | motory   | motoryz   |
| Boron   | ppm  | ASTM D5185m  | 0  | 41  | 2  | 8   |
|   | ppm<br>ppm   |  | 0  |   | 2<br><1  |   |
| Boron   |  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60   | 41  | 2<br><1<br>62  | 8<br>0<br>61  |
| Boron<br>Barium<br>Molybdenum<br>Manganese  | ppm  | ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60   | 41<br>0   | 2<br><1<br>62<br><1  | 8<br>0<br>61<br><1  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60   | 41<br>0<br>44<br>0<br>647   | 2<br><1<br>62<br><1<br>991   | 8<br>0<br>61<br><1<br>949   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium  | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0  | 41<br>0<br>44<br>0<br>647<br>1564   | 2<br><1<br>62<br><1<br>991<br>1162   | 8<br>0<br>61<br><1<br>949<br>1115   |
| 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  | 41<br>0<br>44<br>0<br>647<br>1564<br>861  | 2<br><1<br>62<br><1<br>991<br>1162<br>1061   | 8<br>0<br>61<br><1<br>949<br>1115<br>1049   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc  | 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  | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058  | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304   | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277   |
| 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  | 41<br>0<br>44<br>0<br>647<br>1564<br>861  | 2<br><1<br>62<br><1<br>991<br>1162<br>1061   | 8<br>0<br>61<br><1<br>949<br>1115<br>1049   |
| 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  | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058  | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304   | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277   |
| 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>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base   | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201  | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706   | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641   |
| 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<br>limit/base   | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br>current   | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1   | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<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               | 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>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25   | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br>current<br>10   | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8  | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6  |
| 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        | 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>>25   | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br><u>current</u><br>10<br>4   | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8<br>10  | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6<br>6<br>6  |
| 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        | ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25  | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br><u>current</u><br>10<br>4<br>7                                      | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8<br>10<br>15  | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6<br>6<br>6<br>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                                     | 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>limit/base<br>>25<br>>20<br>limit/base  | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br>current<br>10<br>4<br>7<br>current                                  | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8<br>10<br>15<br>history1                                    | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6<br>6<br>6<br>5<br>5<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>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>>25<br>20<br>imit/base<br>>3<br>>20                                    | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br>current<br>10<br>4<br>7<br>current<br>0.6                           | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8<br>10<br>15<br>history1<br>0.8                             | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6<br>6<br>6<br>5<br>5<br>history2<br>0.7                             |
| 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>>25<br>20<br>imit/base<br>>3<br>>20                                    | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br>current<br>10<br>4<br>7<br>current<br>0.6<br>8.8                    | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8<br>10<br>15<br>history1<br>0.8<br>11.1                     | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6<br>6<br>6<br>6<br>5<br><b>history2</b><br>0.7<br>10.9              |
| 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>>25<br><b>imit/base</b><br>>20<br><b>imit/base</b><br>>3<br>>20 | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br>current<br>10<br>4<br>7<br>current<br>0.6<br>8.8<br>23.2            | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8<br>10<br>15<br>history1<br>0.8<br>11.1<br>21.1             | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6<br>6<br>6<br>5<br><u>history2</u><br>0.7<br>10.9<br>19.5           |
| 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>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>imit/base<br>>25<br>imit/base<br>>30<br>>30<br>imit/base                            | 41<br>0<br>44<br>0<br>647<br>1564<br>861<br>1058<br>3201<br>current<br>10<br>4<br>7<br>current<br>0.6<br>8.8<br>23.2<br>current | 2<br><1<br>62<br><1<br>991<br>1162<br>1061<br>1304<br>3706<br>history1<br>8<br>10<br>15<br>history1<br>0.8<br>11.1<br>21.1<br>history1 | 8<br>0<br>61<br><1<br>949<br>1115<br>1049<br>1277<br>3641<br>history2<br>6<br>6<br>6<br>6<br>5<br>history2<br>0.7<br>10.9<br>19.5<br>history2 |



## **OIL ANALYSIS REPORT**





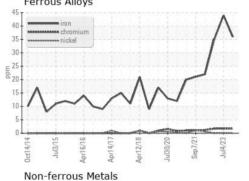


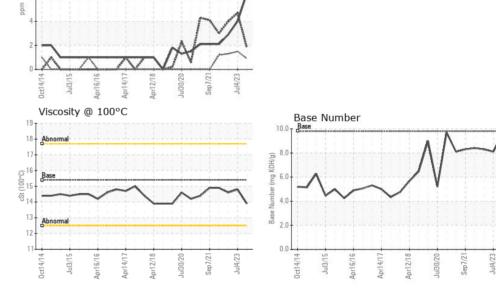
| VISUAL           |        | method    | limit/base | current | history1 | history2 |
|------------------|--------|-----------|------------|---------|----------|----------|
| White Metal      | scalar | *Visual   | NONE       | NONE    | NONE     | NONE     |
| Yellow Metal     | scalar | *Visual   | 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       | 13.9    | 14.8     | 14.6     |
| GRAPHS           |        |           |            |         |          |          |

Ferrous Alloys

lead

10





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 007 - Brunswick Sample No. : GFL0123352 Received : 18 Jul 2024 2809 Galloway Road Lab Number : 06240037 Tested : 19 Jul 2024 Bolivia, NC US 28422 Unique Number : 11128871 Diagnosed : 19 Jul 2024 - Sean Felton Test Package : FLEET Contact: DONALD CRAVEN Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. dcraven@gflenv.com T: \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. 

 End of the simple acceptance decision rule (JCGM 106:2012)

 Report Id: GFL007 [WUSCAR] 06240037 (Generated: 07/21/2024 11:56:19) Rev: 1
 Submitted

Submitted By: DONALD CRAVEN

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