

OIL ANALYSIS REPORT

Sample Rating Trend





Component

Diesel Engine Fluic

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 | MATION | method | limit/base | current | history1 | history2 |
|---|---|---|--|--|---|---|
| Sample Number | | Client Info | | GFL0069137 | GFL0077463 | GFL0071333 |
| Sample Date | | Client Info | | 06 Sep 2023 | 25 Apr 2023 | 02 Mar 2023 |
| Machine Age | mls | Client Info | | 0 | 0 | 11178 |
| Oil Age | mls | Client Info | | 0 | 0 | 11088 |
| Oil Changed | | Client Info | | Not Changd | Not Changd | Changed |
| 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 METAL | S | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >100 | 10 | 9 | 19 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | <1 | <1 | 1 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | | 3 | 2 | 6 |
| Lead | ppm | ASTM D5185m | >40 | <1 | 0 | <1 |
| Copper | ppm | ASTM D5185m | | 1 | 0 | 1 |
| Tin | ppm | ASTM D5185m | >15 | <1 | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| | 1-1- | | | - | - | |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | 0 | 8 | 9 | 6 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | 0 | 8 0 | 9 0 | 6 0 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 | 8 0 65 | 9 0 60 | 6 0 60 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 | 8 0 65 1 | 9 0 60 <1 | 6 0 60 <1 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 | 8 0 65 1 1002 | 9 0 60 <1 899 | 6 0 60 <1 854 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 | 8 0 65 1 1002 1098 | 9 0 60 <1 899 1064 | 6 0 60 <1 854 1055 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 | 8 0 65 1 1002 1098 1062 | 9 0 60 <1 899 1064 957 | 6 0 60 <1 854 1055 902 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 | 8 0 65 1 1002 1098 1062 1346 | 9 0 60 <1 899 1064 957 1203 | 6 0 60 <1 854 1055 902 1142 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 | 8 0 65 1 1002 1098 1062 | 9 0 60 <1 899 1064 957 | 6 0 60 <1 854 1055 902 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 | 8 0 65 1 1002 1098 1062 1346 3975 current | 9 0 60 <1 899 1064 957 1203 | 6 0 60 <1 854 1055 902 1142 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 | 8 0 65 1 1002 1098 1062 1346 3975 | 9 0 60 <1 899 1064 957 1203 3254 | 6 0 60 <1 854 1055 902 1142 2966 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 | 8 0 65 1 1002 1098 1062 1346 3975 current | 9 0 60 <1 899 1064 957 1203 3254 history1 | 6 0 60 <1 854 1055 902 1142 2966 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 imit/base >25 | 8 0 65 1 1002 1098 1062 1346 3975 current 5 | 9 0 60 <1 899 1064 957 1203 3254 history1 4 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 imit/base >25 | 8 0 65 1 1002 1098 1062 1346 3975 current 5 3 | 9 0 60 <1 899 1064 957 1203 3254 history1 4 2 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 | 8 0 65 1 1002 1098 1062 1346 3975 current 5 3 2 | 9 0 60 <1 899 1064 957 1203 3254 history1 4 2 0 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 2 <1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 >25 | 8 0 65 1 1002 1098 1062 1346 3975 current 5 3 2 2 | 9 0 60 <1 899 1064 957 1203 3254 history1 4 2 0 0 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 2 <1 10 2 <1 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20 | 8 0 65 1 1002 1098 1062 1346 3975 <u>current</u> 5 3 2 <u>current</u> 1.2 | 9 0 60 <1 899 1064 957 1203 3254 history1 4 2 0 history1 1.2 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 2 <1 10 2 <1 history2 2.4 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20 | 8 0 65 1 1002 1098 1062 1346 3975 <i>current</i> 5 3 2 <i>current</i> 1.2 7.2 | 9 0 60 <1 899 1064 957 1203 3254 history1 4 2 0 history1 1.2 7.4 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 2 <1 10 2 <1 history2 2.4 11.2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 imit/base >3 >20 >30 | 8 0 65 1 1002 1098 1062 1346 3975 current 5 3 2 current 1.2 7.2 19.2 | 9 0 60 <1 899 1064 957 1203 3254 history1 4 2 0 0 history1 1.2 7.4 17.9 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 2 <1 10 2 <1 <u>history2</u> 2.4 11.2 23.2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAC | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D7844 *ASTM D7844 | 0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 220 33 220 330 20 330 | 8 0 65 1 1002 1098 1062 1346 3975 <i>current</i> 5 3 2 <i>current</i> 1.2 7.2 19.2 <i>current</i> | 9 0 60 <1 899 1064 957 1203 3254 history1 4 2 0 history1 1.2 7.4 1.2 7.4 17.9 history1 | 6 0 60 <1 854 1055 902 1142 2966 history2 10 2 <1 10 2 <1 history2 2.4 11.2 23.2 history2 |

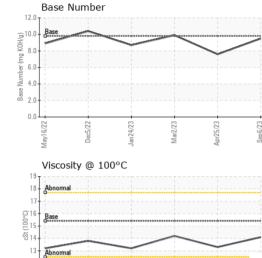


12 11 May16/22

Dec5/22

OIL ANALYSIS REPORT

VISUAL



| Certificate L2367 To chickey up of the sample rest Pacel | | : GFL0069137 : <mark>05947007</mark> | 501 Madison Ave., Cary, NC 27513 Received : 11 Sep 2023 Diagnosed : 12 Sep 2023 Diagnostician : Wes Davis ice at 1-800-237-1369. | | | GFL Enviro | GFL Environmental - 072 - Americus - Transwaste 361 McMath Mill Road Americus, GA US 31719 Contact: RICHARD HEINZERLING richard.heinzerling@gflenv.com | | | |
|---|---------------------|--|--|---------------------|---|----------------|---|------------------|--|--|
| | | 16 15 14 13 12 11 12 11 12 11 12 11 12 12 | Jan.24/23 | Apr25/23 | (0.04(0) 8.0- 0.0 - 2.0- 2.0- 2.0- 0.0 2.0- 0.0 | May16/22 | Jan24/23 | Apr25/23 | | |
| | | Viscosity @ 100°(| C | | 12.0 | Base Number | \sim | \checkmark | | |
| | | 2 | Jan 24/23 | Apr25/23 | Sep6/23 | | | | | |
| | | 6- 4- | | | | | | | | |
| | | Non-ferrous Meta | - | Ap | 8 | | | | | |
| | | Dec5/22 | Janz4y23 | Apr25/23 | Sep6/23 | | | | | |
| Jan 24,23 Mar 2,23 | Apr25/23 | 15- chromium nickel | | | _ | | | | | |
| | | GRAPHS Ferrous Alloys | | | | | | | | |
| | | FLUID PROPE Visc @ 100°C | cSt | method ASTM D445 | limit/base 15.4 | current | history1 13.3 | history2 14.2 | | |
| С | | Emulsified Water Free Water | scalar scalar | *Visual *Visual | >0.2 | NEG NEG | NEG NEG | NEG NEG | | |
| Jan 24/23 Mar 2/23 | Apr25/23 Sep6/23 | Appearance Odor | scalar scalar | *Visual *Visual | NORML NORML | NORML NORML | NORML NORML | NORML NORML | | |
| | | Debris Sand/Dirt | scalar scalar | *Visual *Visual | NONE | NONE NONE | NONE NONE | NONE NONE | | |
| | Precipitate Silt | scalar scalar | *Visual *Visual | NONE | NONE NONE | NONE | NONE | | | |
| | | | | | | | | | | |



Page 2 of 2