

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 713077 Component Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- GAL)

| Sample Number Client Info GFL0108911 GFL0105584 GFL000908 mended Sample Date Client Info 01 Mar 2024 14 Dec 2023 22 Nov 2023 Machine Age hrs Client Info 1768 1343 1158 0 Machine Age hrs Client Info GR00 1158 0 0 Oil Age Client Info Changed Changed Not Changed SEVENE NORMAL Sample Status Imit/base current history1 history1 history2 Vater WC Method Imit/base current history1 history2 Vex AR METALS method Imit/base current history1 history2 Of the Iron ppm ASTM 05185n >20 <1 <1 <1 Nickel ppm ASTM 05185n >20 0 0 <1 <1 Lead ppm ASTM 05185n >330 <1 <1 <1 <1 <1 <th></th> <th></th> <th></th> <th></th> <th>2023</th> <th>Dec2023 Mar20</th> <th>21</th> <th></th> | | | | | 2023 | Dec2023 Mar20 | 21 | |
|---|------------------|---------------|---------------|-------------|------------|---------------|-------------|-------------|
| Sample Date Client Info 01 Mar 2024 14 Dec 2023 22 Nov 2023 Machine Age hrs Client Info 1768 1343 1158 0 Oil Ghage bit Client Info 600 1158 0 0 Sample Status Imathe Client Info Changed Changed Not Changed Not Changed Sample Status Imathe Client Info Changed Not Changed Not Changed Not Changed Vater Water WC Method >0.2 NEG NEG NEG Visol Water WC Method NeG NEG NEG NEG Visol Ppm ASTM 05165n >120 14 12 12 Iron ppm ASTM 05165n >20 <1 -1 1 Nickel ppm ASTM 05165n >2 0 0 0 0 1 Visol ppm ASTM 05165n >2 0 0 0 0 0 0 | | SAMPLE INFORM | IATION | method | limit/base | current | history1 | history2 |
| Io mended Machine Age hrs Client Info 1768 1343 1158 Oil Age hrs Client Info 600 1158 0 0 Oil Age hrs Client Info Changed Changed Not Changd Sample Status Imit/base current History1 History1 History2 cONTAMINATION method Imit/base current History1 History2 control Work Method >0.2 NEG NEG NEG file Water WC Method NEG NEG NEG NEG file Iron ppm ASTM D5185n<>20 c1 1 12 12 tritanium ppm ASTM D5185n<>20 0 0 0 14 12 12 tritanium ppm ASTM D5185n 20 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 <t< td=""><td></td><td>Sample Number</td><td></td><td>Client Info</td><td></td><th>GFL0108911</th><td>GFL0105584</td><td>GFL0089085</td></t<> | | Sample Number | | Client Info | | GFL0108911 | GFL0105584 | GFL0089085 |
| Interval Interval Interval Interval Interval Interval Oil Age Oil Age Oil Age Oil Changed Interval Interval Interval NoRMAL SEVERE NoRMAL CONTAMINATION method Imilibase current history1 history2 Mater WC Method >0.2 NEG NEG NEG NEG Water WC Method >0.2 NEG NEG NEG NEG Water WC Method >0.2 NEG NEG NEG NEG Wickel ppm ASTM 05185n >120 14 12 12 Ittanium ppm ASTM 05185n >20 C 1 -1 -1 Aluminum ppm ASTM 05185n >20 0 0 -1 <t< td=""><td>been</td><td>Sample Date</td><td></td><td>Client Info</td><td></td><th>01 Mar 2024</th><td>14 Dec 2023</td><td>22 Nov 2023</td></t<> | been | Sample Date | | Client Info | | 01 Mar 2024 | 14 Dec 2023 | 22 Nov 2023 |
| Oil Age mis Client Info bu0 1153 0 Oil Changed Client Info Changed NoRMAL SEVERE NORMAL Sample Status CONTAMINATION method Imit/base current history1 history1 CONTAMINATION method imit/base current history1 history2 Giycol WC Method >0.2 NEG NEG NEG Giycol WC Method >0.2 NEG NEG NEG of the Iron ppm ASTM D5165n >2.0 -1 -1 -1 Nickel ppm ASTM D5165n >2.0 0 0 -1 Aluminum ppm ASTM D5165n >2.0 0 0 -1 Aluminum ppm ASTM D5165n >2.0 0 0 -1 Aluminum ppm ASTM D5165n >2.0 0 0 -1 Copper ppm ASTM D5165n >2.0 0 <td rowspan="4">al to mmended</td> <td>Machine Age</td> <td>hrs</td> <td>Client Info</td> <td></td> <th>1768</th> <td>1343</td> <td>1158</td> | al to mmended | Machine Age | hrs | Client Info | | 1768 | 1343 | 1158 |
| Sample Status NORMAL SEVERE NORMAL CONTAMINATION method imil/base current history1 history2 inants Water WC Method >0.2 NEG NEG NEG Giycol WC Method >0.2 NEG NEG NEG NEG of the Iron ppm ASTM D5185n >120 14 12 12 of the Iron ppm ASTM D5185n >5 0 <1 | | Oil Age | hrs | Client Info | | 600 | 1158 | 0 |
| CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history1 of the Iron ppm ASTM 05185n<>120 14 12 12 Chromium ppm ASTM 05185n<>50 0 <1 | | Oil Changed | | Client Info | | Changed | Changed | Not Changd |
| Water WC Method >0.2 NEG NEG NEG Glycol WC Method WEG NEG NEG NEG Uters ppm ASTM 05185m >120 14 12 12 Chromium ppm ASTM 05185m >20 <1 | | Sample Status | | | | NORMAL | SEVERE | NORMAL |
| Giycol WC Method NEG NEG NEG of the Iron ppm ASTM D5185m >120 14 12 12 of the Iron ppm ASTM D5185m >20 <1 | | CONTAMINATIO | ON | method | limit/base | current | history1 | history2 |
| WEAR METALS method limit/base current history1 history2 of the Iron ppm ASTM D5185m >12.0 14 12 12 Chromium ppm ASTM D5185m >2.0 <1 | aminants | Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Iron ppm ASTM D5185m >120 14 12 12 Chromium ppm ASTM D5185m >20 <1 | | Glycol | | WC Method | | NEG | NEG | NEG |
| Chromium ppm ASTM D5185m >20 <1 <1 <1 <1 Nickel ppm ASTM D5185m >5 0 <1 | | WEAR METALS | 3 | method | limit/base | current | history1 | history2 |
| Nickel ppm ASTM D5185m >5 0 <1 2 Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >20 2 2 2 Lead ppm ASTM D5185m >20 2 2 2 Lead ppm ASTM D5185m >30 <1 | of the | Iron | ppm | ASTM D5185m | >120 | 14 | 12 | 12 |
| Titanium ppm ASTM D5185m >2 0 0 .1 Silver ppm ASTM D5185m >20 2 2 2 Lead ppm ASTM D5185m >20 2 2 2 Lead ppm ASTM D5185m >20 2 2 2 Lead ppm ASTM D5185m >20 0 0 <1 | | Chromium | ppm | ASTM D5185m | >20 | <1 | <1 | <1 |
| Silver ppm ASTM D5185m >2 0 <1 Aluminum ppm ASTM D5185m >20 2 2 2 Lead ppm ASTM D5185m >40 0 0 <1 | | Nickel | ppm | ASTM D5185m | >5 | 0 | <1 | 2 |
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| Lead ppm ASTM D5185m >40 0 0 <1 Copper ppm ASTM D5185m >330 <1 | | Silver | ppm | ASTM D5185m | >2 | 0 | 0 | <1 |
| Copper ppm ASTM D5185m >330 <1 <1 2 Tin ppm ASTM D5185m >15 0 <1 | | Aluminum | ppm | ASTM D5185m | >20 | 2 | 2 | 2 |
| Tin ppm ASTM D5185m >15 0 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 | | Lead | ppm | ASTM D5185m | >40 | 0 | 0 | <1 |
| Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 | | Copper | ppm | ASTM D5185m | >330 | <1 | <1 | 2 |
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| Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 | | Vanadium | | ASTM D5185m | | 0 | 0 | 0 |
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| Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 64 51 55 Manganese ppm ASTM D5185m 0 0 <1 | | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 60 64 51 55 Manganese ppm ASTM D5185m 0 0 <1 | | Boron | ppm | ASTM D5185m | 0 | <1 | 5 | 3 |
| Manganese Initial Astrict D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 984 840 902 Calcium ppm ASTM D5185m 1070 1078 933 1058 Phosphorus ppm ASTM D5185m 1150 1032 917 1081 Zinc ppm ASTM D5185m 1270 1302 1153 1246 Sulfur ppm ASTM D5185m 2060 2963 2777 2930 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 3 Sodium ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1.3 7.1 <1.0 | | Barium | ppm | ASTM D5185m | 0 | 0 | 0 | 0 |
| Magnesium ppm ASTM D5185m 1010 984 840 902 Calcium ppm ASTM D5185m 1070 1078 933 1058 Phosphorus ppm ASTM D5185m 1150 1032 917 1081 Zinc ppm ASTM D5185m 1270 1302 1153 1246 Sulfur ppm ASTM D5185m 2060 2963 2777 2930 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 3 Sodium ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Socium ppm ASTM D5185m >20 1.3 7.1 <1.0 | | Molybdenum | ppm | ASTM D5185m | 60 | 64 | 51 | 55 |
| Calcium ppm ASTM D5185m 1070 1078 933 1058 Phosphorus ppm ASTM D5185m 1150 1032 917 1081 Zinc ppm ASTM D5185m 1270 1302 1153 1246 Sulfur ppm ASTM D5185m 2060 2963 2777 2930 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 3 Sodium ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Soot % % *ASTM D5185m >20 1.3 7.1 <1.0 | | Manganese | ppm | ASTM D5185m | 0 | 0 | <1 | <1 |
| Phosphorus ppm ASTM D5185m 1150 1032 917 1081 Zinc ppm ASTM D5185m 1270 1302 1153 1246 Sulfur ppm ASTM D5185m 2060 2963 2777 2930 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 3 Sodium ppm ASTM D5185m >20 1 4 3 Sodium ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m 20 1 4 3 Soot % % *ASTM D584 >3.0 1.3 7.1 <1.0 INFRA-RED method limit/base current histor | | Magnesium | ppm | ASTM D5185m | 1010 | 984 | 840 | 902 |
| Phosphorus ppm ASTM D5185m 1150 1032 917 1081 Zinc ppm ASTM D5185m 1270 1302 1153 1246 Sulfur ppm ASTM D5185m 2060 2963 2777 2930 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 3 Sodium ppm ASTM D5185m >25 4 4 3 Sodium ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Soot % % *ASTM D7844 >3.0 1.33 7.1 <1.0 Nitration Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/m *ASTM D7415 >30 | | Calcium | ppm | ASTM D5185m | 1070 | 1078 | 933 | 1058 |
| Zinc ppm ASTM D5185m 1270 1302 1153 1246 Sulfur ppm ASTM D5185m 2060 2963 2777 2930 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 3 Sodium ppm ASTM D5185m >25 4 4 3 Fuel ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1 4 3 Soot % % *ASTM D5185m >20 1 4 3 Fuel % ASTM D5185m >20 1.3 7.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/.mm *ASTM D7415 30 20.4 <td>Phosphorus</td> <td></td> <td>ASTM D5185m</td> <td>1150</td> <th>1032</th> <td>917</td> <td>1081</td> | | Phosphorus | | ASTM D5185m | 1150 | 1032 | 917 | 1081 |
| SulfurppmASTM D5185m2060296327772930CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25443SodiumppmASTM D5185m>20143PotassiumppmASTM D5185m>20143Fuel%ASTM D5185m>20143Fuel%ASTM D5185m>201.3▲7.1<1.0 | | | | ASTM D5185m | 1270 | 1302 | 1153 | 1246 |
| Silicon ppm ASTM D5185m<>25 4 4 3 Sodium ppm ASTM D5185m 3 61 4 Potassium ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D3524 >3.0 1.3 ▲ 7.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Current history1 history2 0.0 20.1 1 4 8.5 Sulfation Abs/.1mm *ASTM D7624 >20 9.3 9.4 8.5 Current history1 history2 20.0 20.1 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | Sulfur | | | 2060 | 2963 | 2777 | 2930 |
| Sodium ppm ASTM D5185m 3 61 4 Potassium ppm ASTM D5185m<>20 1 4 3 Fuel % ASTM D5324<>3.0 1.3 7.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844<>4 0.4 0.5 0.4 Nitration Abs/cm *ASTM D7624<>20 9.3 9.4 8.5 Sulfation Abs/.1mm *ASTM D7145<>30 20.4 20.0 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414<>25 17.6 16.3 16.9 | | CONTAMINANT | ٢S | method | limit/base | current | history1 | history2 |
| Potassium ppm ASTM D5185m >20 1 4 3 Fuel % ASTM D3524 >3.0 1.3 ▲ 7.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 20.0 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | Silicon | ppm | ASTM D5185m | >25 | 4 | 4 | 3 |
| Fuel % ASTM D3524 >3.0 1.3 ▲ 7.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 20.0 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | Sodium | ppm | ASTM D5185m | | 3 | 61 | 4 |
| INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 20.0 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | Potassium | ppm | ASTM D5185m | >20 | 1 | 4 | 3 |
| Soot % % *ASTM D7844 >4 0.4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 20.0 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | Fuel | % | ASTM D3524 | >3.0 | 1.3 | ▲ 7.1 | <1.0 |
| Nitration Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 20.0 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | INFRA-RED | | method | limit/base | current | history1 | history2 |
| Nitration Abs/cm *ASTM D7624 >20 9.3 9.4 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 20.0 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | Soot % | % | *ASTM D7844 | >4 | 0.4 | 0.5 | 0.4 |
| SulfationAbs/.1mm*ASTM D7415>3020.420.020.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2517.616.316.9 | | | | | >20 | | | |
| Oxidation Abs/.1mm *ASTM D7414 >25 17.6 16.3 16.9 | | | | | | | | |
| | | FLUID DEGRAD | ATION | method | limit/base | current | history1 | history2 |
| | | Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 17.6 | 16.3 | 16.9 |
| | | | | | | | | |

DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. Resample at the next service interval to monitor. No other corrective action is recommended at this time.

Fluid

Wear

All component wear rates are normal.

Contamination

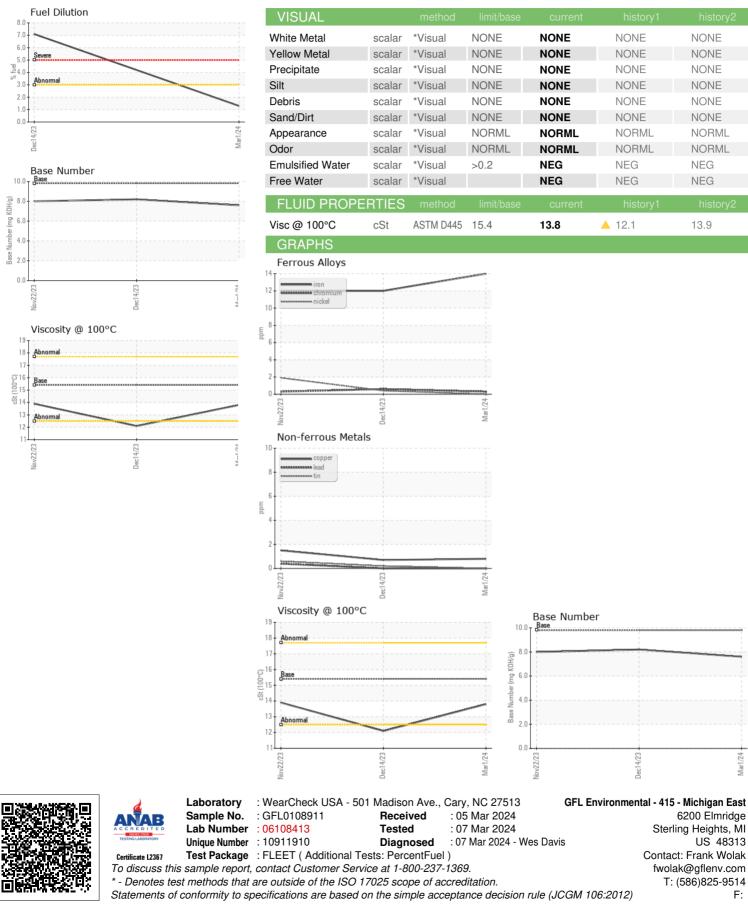
Light fuel dilution occurring. No other contaminants were detected in the oil.

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.



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