

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 913061

Fluid

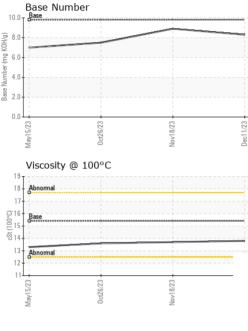
Component **Diesel Engine**

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

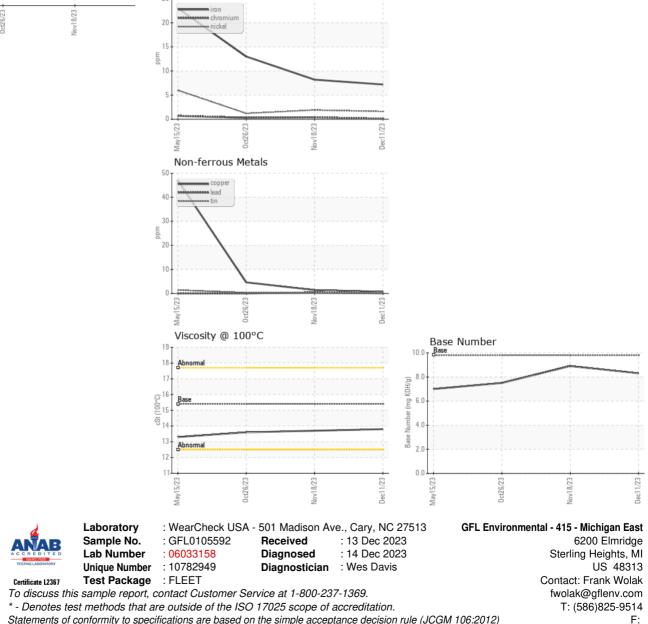
| seample Data Client Info 11 Dec 2031 16 Nov 2002 26 Oct 2023 Wach Component wear rates are normal. Dil Age his Client Info 3115 2997 1837 Dirace Is no indication of any contamination in the it. Northand Northand <t< th=""><th>DIAGNOSIS</th><th>SAMPLE INFOR</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<> | DIAGNOSIS | SAMPLE INFOR | MATION | method | limit/base | current | history1 | history2 |
|---|--|------------------|----------|-------------|------------|-------------|-------------|-------------|
| Ware Use component wear rates are normal. Machine Age (Ni Age) Inside (Ni Age) Inside (Ni Age) No Mathematical (Ni Age) Mathema | Recommendation | Sample Number | | Client Info | | GFL0105592 | GFL0089167 | GFL0093147 |
| Out Age http://http | Resample at the next service interval to monitor. | Sample Date | | Client Info | | 11 Dec 2023 | 18 Nov 2023 | 26 Oct 2023 |
| Id component wear rates are normal. Dorthamination Dir Léanged Cilen Info 313 2997 1837 Dir Changed Cilen Info Nor Changed Nor Changed Nor Changed Nor MALL Normal. Find Condition The BN result indicates that there is suitable for further service. Imbebase current Hetory1 Hetory2 Fuel WC Method -3.0 <1.0 <1.0 <1.0 <1.0 Water Nor Method -3.0 <1.0 <1.0 <1.0 <1.0 Water WC Method -3.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 1.0 | Wear | Machine Age | hrs | Client Info | | 3311 | 3135 | 2997 |
| Charannet in indication of any contamination in the interpret in solutable of any contamination in the interpret in solutable in the interpret interpret in solutable in the interpret in | All component wear rates are normal. | Oil Age | hrs | Client Info | | 3135 | 2997 | 1837 |
| Sample Status NORMAL NORMAL NORMAL NORMAL Mulcing membrane is suitable within yreaning in the oil. The condition of the bill is suitable for further service. CONTAMINATION method Imitbase current history1 History2 Viel WC Method S.0 <1.0 <1.0 <1.0 <1.0 Water WC Method S.0 NEG NEG NEG Bill is suitable for further service. WC Method NEG NEG NEG Vice AR METALS method Imitbase current history1 history1 Non ppm ASTM05/Km >20 <1 <1 1 Non ppm ASTM05/Km >20 <1 <1 0 Silver ppm ASTM05/Km >20 <1 2 <1 Lead ppm ASTM05/Km >20 <1 2 <1 Lead ppm ASTM05/Km >60 <1 <1 <1 Lead ppm ASTM05 | • | Oil Changed | | Client Info | | | N/A | Changed |
| Particition CONTIAMINATION methods imbibase current inatory inatory The BM result indicates that there is suitable all is suitable for further service. Fuel WC Method >0.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 | There is no indication of any contamination in the | | | | | - | NORMAL | |
| The BJ result indicates that there is suitable dividintly remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The vidiality remaining remaininithe remaininining remaining remaining remaining remaining remain | oil. | CONTAMINAT | ION | method | limit/base | current | history1 | history2 |
| Water Work (Wethod is)0.2 NEG NEG NEG NEG NEG Is suitable for further service. WO (Method is)0.2 NEG NEG NEG NEG VVCAP Department Neg NEG NEG NEG NEG Iron ppm ASTM 05/85m >12.0 7 8 13 Chromium ppm ASTM 05/85m >2.0 <1 <1 1 Niced ppm ASTM 05/85m >2.0 0 <1 0 Silver ppm ASTM 05/85m >2.0 0 <1 0 Aluminum ppm ASTM 05/85m >2.0 0 <1 1 0 Copper ppm ASTM 05/85m >0 <1 <1 <1 1 Vanadium ppm ASTM 05/85m 0 <1 <1 <1 Vanadium ppm ASTM 05/85m 0 <1 <1 <1 Vanadium ppm AS | | Fuel | | WC Method | >3.0 | <1.0 | <1.0 | <1.0 |
| Glycol WC Method NEG NEG NEG ii is suitable for further service. Glycol WC Method Imitbase current history1 history2 Iron ppm ASTIM 56166 >120 7 8 13 Chromium ppm ASTIM 56166 >20 <1 <1 1 Nickel ppm ASTIM 56166 >2 0 <1 0 Silver ppm ASTIM 56166 >2 0 <1 0 Aluminum ppm ASTIM 56166 >30 <1 1 5 Tin ppm ASTIM 56166 >30 <1 1 5 Tin ppm ASTIM 56166 >0 0 <1 <1 Vaaduim ppm ASTIM 56166 0 0 <1 <1 Vaaduim ppm ASTIM 56166 0 0 <4 <4 Vaaduim ppm ASTIM 56166 0 5 68 | | Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Iron ppm ASTM D5185m >120 7 8 13 Chromium ppm ASTM D5185m >20 <1 | bil is suitable for further service. | Glycol | | WC Method | | NEG | NEG | NEG |
| Chromium ppm ASTM DS185m >20 <1 | | WEAR METAL | .S | method | limit/base | current | history1 | history2 |
| Chromium ppm ASTM D5185m >20 <1 | | Iron | ppm | ASTM D5185m | >120 | 7 | 8 | 13 |
| Nickel ppm ASTM D5185m >5 2 2 1 Titanium ppm ASTM D5185m >2 0 <1 0 Silvor ppm ASTM D5185m >20 <1 2 <1 Aluminum ppm ASTM D5185m >20 <1 2 <1 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >40 0 <1 <1 Vanadium ppm ASTM D5185m >10 <11 <5 Vanadium ppm ASTM D5185m 0 <11 <1 <1 Vanadium ppm ASTM D5185m 0 <11 <1 <1 Barium ppm ASTM D5185m 0 <1 <1 <1 Molybdenum ppm ASTM D5185m 0 <1 <1 <1< Marganese ppm ASTM D5185m 1010 993 | | Chromium | | | | | | |
| Titanium ppm ASTM D5185m >2 0 <1 | | Nickel | | | | 2 | | |
| Silver ppm ASTU D5185m >2 0 0 <1 | | | | | | | | |
| Aluminum ppm ASTM D5185m >20 <1 | | | | | | | | |
| Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 <1 1 5 Tin ppm ASTM D5185m >0 <1 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 <1 0 0 ADDITIVES method imit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 <1 3 Barlum ppm ASTM D5185m 0 <1 <1 3 Magnesse ppm ASTM D5185m 0 <1 <1 <1 Magnessium ppm ASTM D5185m 0 <1 <1 <1 Magnessium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 120 104 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> | | | | | | | | |
| Copper ppm ASTM D5185m >330 <1 | | | | | | | | |
| Tin ppm ASTM D5185m >15 0 <1 | | | | | | | | |
| Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 <1 3 Barium ppm ASTM D5185m 0 <1 <1 3 Molybdenum ppm ASTM D5185m 0 52 68 58 Manganese ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1233 1113 Sulfur ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 20 3044 3440 2430 Contation ppm ASTM D5185m 20 304 3 | | | | | | | | |
| Cadimium ppm ASTM D5185m 0 <1 | | | | | | | | |
| Boron ppm ASTM D5185m 0 <1 <1 3 Barium ppm ASTM D5185m 0 0 9 4 Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1010 102 1223 9243 Phosphorus ppm ASTM D5185m 1070 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >206 3044 3344 2430 Dotassium ppm ASTM D5185m >20 <1 3 0 INFFRA-RED method | | | | | | | | |
| Barium ppm ASTM D5185m 0 0 9 4 Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3444 2430 CONTAMINANTS method imit/base current history1 history2 Silicon ppm ASTM D5185m 20 <1 3 0 INFRA-RED ppm ASTM D7844 <th></th> <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th> | | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Barium ppm ASTM D5185m 0 0 9 4 Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 20 3044 344 2430 Contassium ppm ASTM D5185m 20 4 5 3 Sodium ppm ASTM D5185m 20 5 4 5 3 Sodium ppm <th></th> <th>Boron</th> <th>ppm</th> <th>ASTM D5185m</th> <th>0</th> <th><1</th> <th><1</th> <th>3</th> | | Boron | ppm | ASTM D5185m | 0 | <1 | <1 | 3 |
| Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1150 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 31 3 0 Sodium ppm ASTM D5185m >20 <1 3 0 INFRA-RED method limit/base current history1 history2 Soot % % 'ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/m 'A | | Barium | | | | | 9 | |
| Marganese prm ASTM D5185m 0 <1 | | Molvbdenum | | | | 52 | 68 | 58 |
| Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1123 983 Zinc ppm ASTM D5185m 1150 1049 1145 983 Sulfur ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 <1 | | - | | | | | | |
| Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1150 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 <1 3 0 INFRA-RED ppm ASTM D5185m >20 <1 3 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/rm *ASTM D7844 >4 0.5 0.3 0.7 Sulfation Abs/rm *ASTM D7844 >4 0.5 0.3 0.7 Sulfation Abs/rm < | | - | | | | | | |
| Phosphorus ppm ASTM D5185m 1150 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 41 34 4 Potassium ppm ASTM D5185m >20 <1 | | - | | | | | | |
| Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 4 5 3 Sodium ppm ASTM D5185m >20 <1 | | | | | | | | |
| SulfurppmASTM D5185m2060304433442430CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25453SodiumppmASTM D5185m>20244PotassiumppmASTM D5185m>20<130INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.50.30.7NitrationAbs/cm*ASTM D7624>206.76.17.5SulfationAbs/.1mm*ASTM D7415>3018.818.719.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.414.714.5 | | | | | | | | |
| SiliconppmASTM D5185m>25453SodiumppmASTM D5185m224PotassiumppmASTM D5185m>20<1 | | | | | | | | |
| SodiumppmASTM D5185m224PotassiumppmASTM D5185m>20<130INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.50.30.7NitrationAbs/cm*ASTM D7624>206.76.17.5SulfationAbs/.1mm*ASTM D7415>3018.818.719.1FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.414.714.5 | | CONTAMINAN | ITS | method | limit/base | current | history1 | history2 |
| PotassiumppmASTM D5185m>20<1 | | Silicon | ppm | | >25 | 4 | | 3 |
| INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/cm *ASTM D7624 >20 6.7 6.1 7.5 Sulfation Abs/.tmm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 14.4 14.7 14.5 | | Sodium | ppm | ASTM D5185m | | 2 | | 4 |
| Soot % % *ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/cm *ASTM D7624 >20 6.7 6.1 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5 | | Potassium | ppm | ASTM D5185m | >20 | <1 | 3 | 0 |
| Nitration Abs/cm *ASTM D7624 >20 6.7 6.1 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5 | | INFRA-RED | | method | limit/base | e current | history1 | history2 |
| Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5 | | Soot % | % | *ASTM D7844 | >4 | 0.5 | 0.3 | 0.7 |
| FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.414.714.5 | | Nitration | Abs/cm | *ASTM D7624 | >20 | 6.7 | 6.1 | 7.5 |
| Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5 | | Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 18.8 | 18.7 | 19.1 |
| | | FLUID DEGRAI | DATION | method | limit/base | e current | history1 | history2 |
| | | Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 14.4 | 14.7 | 14.5 |
| | | Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | 8.3 | 8.9 | 7.5 |



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 | 13.8 | 13.7 | 13.6 |
| GRAPHS | | | | | | |
| Ferrous Alloys | | | | | | |



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

Submitted By: Frank Wolak