

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 928051

Fluid

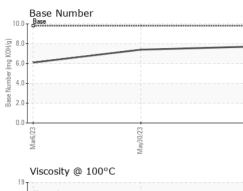
Component **Diesel Engine**

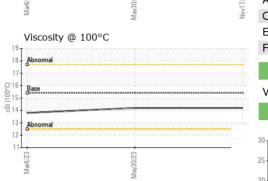
PETRO CANADA DURON SHP 15W40 (--- GAL)

| Second billion Sample Number Client Info GFL011345 GFL001390 GFL0073848 Sample Date Glient Info 177 Mer 2023 30 May 2022 00 | | | | | ar2023 | May2023 Nov20 | LJ | |
|---|---|---------------|----------|-------------|------------|---------------|-------------|-------------|
| seample at the net service interval to monitor. Sample Date Client Info 17 Rev 2023 80 May 2023 06 Mar 2023 tomponent war rates are normal. Onl Age hrs Client Info 17820 16577 16013 oritarination revel in information Client Info 17820 Changed Changed revel in officiation of any contamination in the its suitable for further service. Sample Status In allows Current NetSo Changed Ch | DIAGNOSIS | SAMPLE INFOR | MATION | method | limit/base | current | history1 | history2 |
| Team price Machine Age hrs Client Info 17820 16577 16018 Normanimation Normanimation in the All Client Info 17820 Changed | Recommendation | Sample Number | | Client Info | | GFL0101545 | GFL0081390 | GFL0073848 |
| Outgoins wear rates are normal. Oil Age hrs Client Info 116577 16018 0 ortamination nere is no indication of any contamination in the the is suitable for further service. Oil Changed Client Info Changed Cha | Resample at the next service interval to monitor. | Sample Date | | Client Info | | 17 Nov 2023 | 30 May 2023 | 06 Mar 2023 |
| Outsimination there is in indication of any contamination in the . Old Changed Sample Status Client Info Changed NORBAL Changed NEG <thchanged NEG Changed NEG <thchanged< td=""><td>Vear</td><td>Machine Age</td><td>hrs</td><td>Client Info</td><td></td><th>17820</th><td>16577</td><td>16018</td></thchanged<></thchanged | Vear | Machine Age | hrs | Client Info | | 17820 | 16577 | 16018 |
| ontaination there is no indication of any containination in the sample Status Client Info Changed Changed Changed Changed Sample Status I NORMAL NORMAL NORMAL NORMAL NORMAL I contraining in the oil. The condition of the Is is suitable for further service. Intel condition of the Glycol WC Method >3.0 <1.0 | Il component wear rates are normal. | Oil Age | hrs | Client Info | | 16577 | 16018 | 0 |
| Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL uil condition ne SN result indicates that there is suitable CONTAMINATION method Iuni/base current history1 history1 Fuel WC Method >3.0 <1.0 | | Oil Changed | | Client Info | | Changed | Changed | Changed |
| Util Candition the BA result indicates that there is suitable kallinky remaining in the oil. The condition of the is suitable for further service. Fuel Water WO Method Wo Method 3.0 <1.0 <1.0 <1.0 <1.0 Water WO Method >0.2 NEG NEG NEG NEG Using the for further service. WC ARM ETALS maintod Unitbase Current Nieday Nieday Vior Physica WC Method >0.2 NEG NEG NEG Vior Physica WC Method Sol <1 | here is no indication of any contamination in the | - | | | | - | | |
| Pelo W0 Method >3.0. <1.0. | | CONTAMINAT | ION | method | limit/base | current | history1 | history2 |
| Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG Water glycol WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG NEG Ion ppm ASTM058im >2.0 <1 | | Fuel | | WC Method | >3.0 | <1.0 | <1.0 | <1.0 |
| Gigod WC Mathod NEG NEG NEG is suitable for further service. WC MAR METALS method limitbase current history1 history2 Iron ppm ASTM DSISm >20 1 -1 -1 Nickel ppm ASTM DSISm >20 -1 -1 -1 Nickel ppm ASTM DSISm >2 0 0 0 Silver ppm ASTM DSISm >2 -1 -1 -1 Copper ppm ASTM DSISm >2 -1 0 -1 Copper ppm ASTM DSISm >20 4 4 6 Lead ppm ASTM DSISm >300 1 -1 1 Tin ppm ASTM DSISm >300 1 -1 0 0 Cadmium ppm ASTM DSISm 0 0 2 2 Boron ppm ASTM DSISm 0 0 1 | | | | | | | | |
| Iron ppm ASTM D5185m >12.0 18 2.0 2.9 Chromium ppm ASTM D5185m >2.0 <1 | , , | | | | | | | |
| Chromium ppm ASTM DS185m >20 <1 | | WEAR METAL | .S | method | limit/base | current | history1 | history2 |
| Chromium ppm ASTM DS185m >20 <1 <1 <1 Nickel ppm ASTM DS185m >2 <1 | | Iron | maa | ASTM D5185m | >120 | 18 | 20 | 29 |
| Nickel ppm ASTM D5185m >-5 <1 <1 <1 Titanium ppm ASTM D5185m >-2 0 0 0 Silver ppm ASTM D5185m >-20 0 0 0 Aluminum ppm ASTM D5185m >-20 4 4 6 Lead ppm ASTM D5185m >-20 1 0 -11 Copper ppm ASTM D5185m >-30 1 -1 1 Tin ppm ASTM D5185m >-15 <1 | | | | | | | | |
| Titanium ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >20 4 4 6 6 Aluminum ppm ASTM D5185m >20 4 4 6 6 Lead ppm ASTM D5185m >40 -1 0 <1 | | | | | | | | |
| Silver ppm ASTM 05160m >20 0 0 0 Aluminum ppm ASTM 05160m >200 4 4 6 Lead ppm ASTM 05160m >200 4 4 6 Copper ppm ASTM 05160m >330 1 -<1 0 Copper ppm ASTM 05160m >15 <1 <1 <1 Tin ppm ASTM 05160m <1 <1 <1 <1 Cadmium ppm ASTM 05160m <1 0 0 0 Cadmium ppm ASTM 05160m 0 9 0 0 0 Barrum ppm ASTM 05160m 0 9 0 0 0 Magnesium ppm ASTM 05160m 0 <1 <1 <1< <1< Magnesium ppm ASTM 05160m 0 <10 913 981 818 Colatium ppm ASTM 05160m 1010 913 981 818 Calcium ppm | | | | | | | | |
| Aluminum ppm ASTM D5185m >20 4 4 6 Lead ppm ASTM D5185m >40 <1 | | | | | | | | |
| Lead ppm ASTM D5185m >4-0 <1 | | | | | | | | |
| Copper ppm ASTM D5185m >330 1 <1 1 Tin ppm ASTM D5185m >15 <1 | | | | | | | | |
| Tin ppm ASTM D5185m >15 <1 | | | | | | | | |
| Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m <1 | | | | | | | | |
| Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 2 2 Barium ppm ASTM D5185m 0 9 0 0 Molybdenum ppm ASTM D5185m 0 63 59 54 Magnesee ppm ASTM D5185m 0 <1 | | | | | >10 | | | |
| ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 2 2 Barium ppm ASTM D5185m 0 9 0 0 Molybdenum ppm ASTM D5185m 60 63 59 54 Manganese ppm ASTM D5185m 0 <1 | | | | | | | | |
| Boron ppm ASTM D5185m 0 0 2 2 Barium ppm ASTM D5185m 0 9 0 0 Molybdenum ppm ASTM D5185m 60 63 59 54 Manganese ppm ASTM D5185m 0 -1 <1 | | | ppm | | | | | |
| Barium ppm ASTM D5185m 0 9 0 0 Molybdenum ppm ASTM D5185m 60 63 59 54 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 913 981 818 Calcium ppm ASTM D5185m 1070 1092 1045 983 Phosphorus ppm ASTM D5185m 1070 1092 1045 983 Phosphorus ppm ASTM D5185m 1270 1201 1262 1122 Sulfur ppm ASTM D5185m 2060 2600 3258 2431 CONTAMINANTS method imit/base current history1 history2 Sulfur ppm ASTM D5185m 206 3 3 4 Potassium ppm ASTM D5185m >20 3 <1 3 INFRA-RED method imit/base | | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 60 63 59 54 Manganese ppm ASTM D5185m 0 <1 | | Boron | ppm | ASTM D5185m | 0 | 0 | 2 | 2 |
| Manganesse ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 913 981 818 Calcium ppm ASTM D5185m 1070 1092 1045 983 Phosphorus ppm ASTM D5185m 1070 1092 1045 983 Phosphorus ppm ASTM D5185m 1270 1201 1262 1122 Sulfur ppm ASTM D5185m 2060 26600 3258 2431 CONTAMINANT method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 <1 | | Barium | ppm | ASTM D5185m | 0 | 9 | 0 | 0 |
| Magnesium ppm ASTM D5185m 1010 913 981 818 Calcium ppm ASTM D5185m 1070 1092 1045 983 Phosphorus ppm ASTM D5185m 1150 980 978 885 Zinc ppm ASTM D5185m 1270 1201 1262 1122 Sulfur ppm ASTM D5185m 2060 2600 3258 2431 CONTAMINANTS method imit/base current history1 history2 Silicon ppm ASTM D5185m >20 6 6 7 Sodium ppm ASTM D5185m >20 3 3 4 Potassium ppm ASTM D5185m >20 3 <1 | | Molybdenum | ppm | ASTM D5185m | 60 | 63 | 59 | 54 |
| Calcium ppm ASTM D5185m 1070 1092 1045 983 Phosphorus ppm ASTM D5185m 1150 980 978 885 Zinc ppm ASTM D5185m 1270 1201 1262 1122 Sulfur ppm ASTM D5185m 2060 2600 3258 2431 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 6 7 Sodium ppm ASTM D5185m >20 3 3 4 Potassium ppm ASTM D5185m >20 3 <1 | | Manganese | ppm | ASTM D5185m | 0 | <1 | <1 | <1 |
| Phosphorus ppm ASTM D5185m 1150 980 978 885 Zinc ppm ASTM D5185m 1270 1201 1262 1122 Sulfur ppm ASTM D5185m 2060 2600 3258 2431 CONTAMINANTS method imit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 6 7 Sodium ppm ASTM D5185m >25 6 6 7 Sodium ppm ASTM D5185m >20 3 4 Potassium ppm ASTM D5185m >20 3 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1.3 1.6 2 Nitration Abs/cm *ASTM D7624 >20 8.8 8.9 10.5 Sulfation Abs/cm *ASTM D7414 >25 15.8 15.7 16.4 | | Magnesium | ppm | ASTM D5185m | 1010 | 913 | 981 | 818 |
| Zinc ppm ASTM D5185m 1270 1201 1262 1122 Sulfur ppm ASTM D5185m 2060 2600 3258 2431 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 6 7 Sodium ppm ASTM D5185m >25 6 6 7 Sodium ppm ASTM D5185m >20 3 3 4 Potassium ppm ASTM D5185m >20 3 <1 | | Calcium | ppm | ASTM D5185m | 1070 | 1092 | 1045 | 983 |
| SulfurppmASTM D5185m2060260032582431CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25667SodiumppmASTM D5185m>20334PotassiumppmASTM D5185m>203<1 | | Phosphorus | ppm | ASTM D5185m | 1150 | 980 | 978 | 885 |
| CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m<>25667SodiumppmASTM D5185m20334PotassiumppmASTM D5185m>203<1 | | Zinc | ppm | ASTM D5185m | 1270 | 1201 | 1262 | 1122 |
| SiliconppmASTM D5185m>25667SodiumppmASTM D5185m334PotassiumppmASTM D5185m>203<1 | | Sulfur | ppm | ASTM D5185m | 2060 | 2600 | 3258 | 2431 |
| SodiumppmASTM D5185m334PotassiumppmASTM D5185m>203<1 | | CONTAMINAN | ITS | method | limit/base | current | history1 | history2 |
| PotassiumppmASTM D5185m>203<13INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>41.31.62NitrationAbs/cm*ASTM D7624>208.88.910.5SulfationAbs/1mm*ASTM D7415>3021.222.423.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/1mm*ASTM D7414>2515.815.716.4 | | Silicon | ppm | ASTM D5185m | >25 | 6 | 6 | 7 |
| INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>41.31.62NitrationAbs/cm*ASTM D7624>208.88.910.5SulfationAbs/1mm*ASTM D7415>3021.222.423.7FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.815.716.4 | | Sodium | ppm | ASTM D5185m | | 3 | 3 | 4 |
| Soot % % *ASTM D7844 >4 1.3 1.6 2 Nitration Abs/cm *ASTM D7624 >20 8.8 8.9 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 21.2 22.4 23.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 15.7 16.4 | | Potassium | ppm | ASTM D5185m | >20 | 3 | <1 | 3 |
| Nitration Abs/cm *ASTM D7624 >20 8.8 8.9 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 21.2 22.4 23.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 15.7 16.4 | | INFRA-RED | | method | limit/base | current | history1 | history2 |
| SulfationAbs/.1mm*ASTM D7415>3021.222.423.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.815.716.4 | | Soot % | % | *ASTM D7844 | >4 | 1.3 | 1.6 | 2 |
| SulfationAbs/.1mm*ASTM D7415>3021.222.423.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.815.716.4 | | Nitration | Abs/cm | *ASTM D7624 | >20 | 8.8 | 8.9 | 10.5 |
| Oxidation Abs/.1mm *ASTM D7414 >25 15.8 15.7 16.4 | | Sulfation | Abs/.1mm | *ASTM D7415 | >30 | | 22.4 | 23.7 |
| | | FLUID DEGRA | DATION | method | limit/base | current | history1 | history2 |
| | | Oxidation | Abs/1mm | *ASTM D7414 | >25 | 15.8 | 15.7 | 16.4 |
| | | | | | | 7.7 | 7.4 | 6.1 |



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 |
| 0/23 - | | scalar | *Visual | NORML | NORML | NORML | NORML |
| May30/23 Nov17/23 | Odor | scalar | *Visual | NORML | NORML | NORML | NORML |
| | Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |
| | Free Water | scalar | *Visual | | NEG | NEG | NEG |
| | FLUID PROPI | ERTIES | method | limit/base | current | history1 | history2 |
| | Visc @ 100°C | cSt | ASTM D445 | 15.4 | 14.2 | 14.2 | 13.8 |
| | GRAPHS | | | | | | |
| | Ferrous Alloys | | | | | | |
| 23 | 30 iron | | | | | | |
| May30/23 | 25- nickel | <hr/> | | | | | |
| 2 | 20- | | | | | | |
| | 튭 15 - | | | | | | |
| | 10- | | | | | | |
| | 5 | | | | | | |
| | | | | | | | |
| | 3/23 | 0/23 - | | 1/23 | | | |
| | Mar6/23 | May30/23 | | Nov17/23 | | | |
| | Non-ferrous Meta | | | | | | |
| | ¹⁰ T | | | | | | |
| | copper | | | | | | |
| | and the second s | | | | | | |
| | 6. | | | | | | |
| | mdd | | | | | | |
| | T | | | | | | |
| | 2- | | | | | | |
| | | | and the other designs in the state of the later | all of the local data in the l | | | |
| | Mar6/23 | ay30/23 | | 1/23 | | | |
| | Mar6 | May30 | | Nov17 | | | |
| | Viscosity @ 100° | С | | | Base Number | | |
| | 18 - Abnormal | | | 10.0 | Base | | |
| | 17- | | | | + | | |
| | C ¹⁶ Base | | | HO 10 6.0 | | | |
| | 00000000000000000000000000000000000000 | | | 10.0 | | | |
| | ⁴ 3 ₁₄ | | | 4.0 | | | |
| | 13 - Abnormal | | | (B/HOX Burner) 100 (B/HOX Burner | | | |
| | 12 | | | 2.0 | | | |
| | 11 | 23 | | 0.0 | | 23 | |
| | Mar6/23 | May30/23 | | Nov17/23 | Mar6/23 | May30/23 | |
| Laboratory Sample No. Lab Number Unique Number | : WearCheck USA - : GFL0101545 : 06013607 r : 10752751 | | d :21 ed :21 | ry, NC 27513 Nov 2023 Nov 2023 s Davis | GFL Envi | ronmental - 415 | - Michigan Ea 6200 Elmridg ling Heights, N US 4831 |
| ificate L2367 Test Package | : FLEET | - | | | | Contact: C | Cos 4631 Cullen Monnet |
| discuss this sample report, | | | | | | | - |
| Denotes test methods that a ements of conformity to spec | | | | | JCGM 106:2012) | | T F |
| | | | | | | | |

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