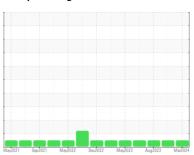


OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



729063

Component **Diesel Engine**

PETRO CANADA DURON GEO LD 15W40 (--- LTR)

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

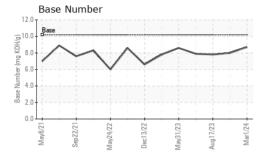
Fluid Condition

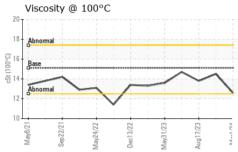
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| Sample Number Client Info GFL0106994 GFL0094245 GFL00982 Sample Date Client Info 01 Mar 2024 25 Nov 2023 17 Aug 2 26 Nov 2023 17 Aug 2 26 Nov 2023 17 Aug 2 26 Nov 2023 19406 01 Aug 2049 Normal 2049 Norm | Мау2021 Sap2021 Мау2022 Dac2022 Мау2023 Aug2023 Мау2024 | | | | | | | |
|--|---|----------|-------------|------------|-------------|-------------|-------------|--|
| Sample Date | SAMPLE INFORM | MATION | method | limit/base | current | history1 | history2 | |
| Machine Age hrs Client Info 20699 20173 19406 Oil Age hrs Client Info 0 0 19406 Oil Changed Changed Changed Changed Changed Changed Sample Status Image: Changed NoRMAL NORMAL NORMAL NORMAL CONTAMINATION method Imit base current bistory1 bistory1 Fuel WC Method >5 <1.0 | Sample Number | | Client Info | | GFL0106994 | GFL0094245 | GFL0085369 | |
| Oil Age hrs Client Info 0 0 19406 Oil Changed Change Changes Changes Changes Changes | Sample Date | | Client Info | | 01 Mar 2024 | 25 Nov 2023 | 17 Aug 2023 | |
| Oil Changed Sample Status Client Info Changed NORMAL NORMAL NORMAL Changed NORMAL NORMAL NORMAL NORMAL Changed NORMAL NORMAL NORMAL NORMAL NORMAL NORMAL Changed NORMAL | Machine Age | hrs | Client Info | | 20699 | 20173 | 19406 | |
| NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 | Oil Age | hrs | Client Info | | 0 | 0 | 19406 | |
| CONTAMINATION method limit/base current history1 history1 Fuel WC Method >5 <1.0 | Oil Changed | | Client Info | | Changed | Changed | Changed | |
| Fuel | Sample Status | | | | NORMAL | NORMAL | NORMAL | |
| Water Glycol WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >100 18 2 8 Chromium ppm ASTM D5185m >20 0 0 <1 | CONTAMINAT | ON | method | limit/base | current | history1 | history2 | |
| WEAR METALS | Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 | |
| WEAR METALS | Water | | WC Method | >0.2 | NEG | NEG | NEG | |
| Iron | Glycol | | WC Method | | NEG | NEG | NEG | |
| Chromium ppm ASTM D5185m >20 0 0 <1 Nickel ppm ASTM D5185m >4 0 0 0 Titanium ppm ASTM D5185m 3 0 0 0 Silver ppm ASTM D5185m >20 <1 | WEAR METAL | S | method | limit/base | current | history1 | history2 | |
| Nickel | Iron | ppm | ASTM D5185m | >100 | 18 | 2 | 8 | |
| Titanium | Chromium | ppm | ASTM D5185m | >20 | 0 | 0 | <1 | |
| Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 <1 1 <1 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 0 <1 <1 Tin ppm ASTM D5185m >15 0 <1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 50 2 23 12 Boron ppm ASTM D5185m 50 57 46 77 Molybdenum ppm ASTM D5185m 50 57 46 77 Mangaesium ppm ASTM D5185m 50 57 46 | Nickel | ppm | ASTM D5185m | >4 | | 0 | 0 | |
| Aluminum ppm ASTM D5185m >20 <1 1 <1 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 0 <1 | Titanium | ppm | ASTM D5185m | | 0 | 0 | <1 | |
| Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 0 <1 <1 Tin ppm ASTM D5185m >15 0 <1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 50 2 23 12 Boron ppm ASTM D5185m 50 2 23 12 Barium ppm ASTM D5185m 50 57 46 77 Manganese ppm ASTM D5185m 50 57 46 77 Manganesium ppm ASTM D5185m 560 880 550 991 Calcium ppm ASTM D5185m 1510 1016 141 | Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 | |
| Copper ppm ASTM D5185m >330 0 <1 <1 Tin ppm ASTM D5185m >15 0 <1 | Aluminum | ppm | ASTM D5185m | >20 | <1 | 1 | <1 | |
| Tin | Lead | ppm | ASTM D5185m | >40 | 0 | 0 | 0 | |
| Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 50 2 23 12 Barium ppm ASTM D5185m 50 57 46 77 Molybdenum ppm ASTM D5185m 50 57 46 77 Manganese ppm ASTM D5185m 50 57 46 77 Magnesium ppm ASTM D5185m 560 880 550 991 Calcium ppm ASTM D5185m 560 880 550 991 Calcium ppm ASTM D5185m 780 998 752 1234 Zinc ppm ASTM D5185m 20 1194 913 1491 Sulfur ppm ASTM D5185m 2040 2671 2324 | Copper | ppm | ASTM D5185m | >330 | 0 | <1 | <1 | |
| Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 50 2 23 12 Barium ppm ASTM D5185m 5 1 0 0 Molybdenum ppm ASTM D5185m 50 57 46 77 Manganese ppm ASTM D5185m 0 0 <1 | Tin | ppm | ASTM D5185m | >15 | 0 | <1 | 0 | |
| ADDITIVES | Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 | |
| Boron | Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 | |
| Barium ppm ASTM D5185m 5 1 0 0 Molybdenum ppm ASTM D5185m 50 57 46 77 Manganese ppm ASTM D5185m 0 0 <1 | ADDITIVES | | method | limit/base | current | history1 | history2 | |
| Molybdenum ppm ASTM D5185m 50 57 46 77 Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 560 880 550 991 Calcium ppm ASTM D5185m 560 880 550 991 Calcium ppm ASTM D5185m 1510 1016 1411 1587 Phosphorus ppm ASTM D5185m 780 998 752 1234 Zinc ppm ASTM D5185m 870 1194 913 1491 Sulfur ppm ASTM D5185m 2040 2671 2324 4128 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 2 2 Sodium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base | Boron | ppm | ASTM D5185m | 50 | 2 | 23 | 12 | |
| Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 560 880 550 991 Calcium ppm ASTM D5185m 1510 1016 1411 1587 Phosphorus ppm ASTM D5185m 780 998 752 1234 Zinc ppm ASTM D5185m 870 1194 913 1491 Sulfur ppm ASTM D5185m 2040 2671 2324 4128 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/.mm *ASTM D77415 <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>5</td> <th>1</th> <td>0</td> <td>0</td> | Barium | ppm | ASTM D5185m | 5 | 1 | 0 | 0 | |
| Magnesium ppm ASTM D5185m 560 880 550 991 Calcium ppm ASTM D5185m 1510 1016 1411 1587 Phosphorus ppm ASTM D5185m 780 998 752 1234 Zinc ppm ASTM D5185m 870 1194 913 1491 Sulfur ppm ASTM D5185m 2040 2671 2324 4128 CONTAMINANTS method limit/base current history1 history1 history1 history2 Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7415 >30 20.9 18.8 19.4 <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>50</td> <th>57</th> <td>46</td> <td>77</td> | Molybdenum | ppm | ASTM D5185m | 50 | 57 | 46 | 77 | |
| Calcium ppm ASTM D5185m 1510 1016 1411 1587 Phosphorus ppm ASTM D5185m 780 998 752 1234 Zinc ppm ASTM D5185m 870 1194 913 1491 Sulfur ppm ASTM D5185m 2040 2671 2324 4128 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m >20 6 2 2 Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION | Manganese | ppm | ASTM D5185m | 0 | 0 | <1 | <1 | |
| Phosphorus ppm ASTM D5185m 780 998 752 1234 Zinc ppm ASTM D5185m 870 1194 913 1491 Sulfur ppm ASTM D5185m 2040 2671 2324 4128 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m >20 6 2 2 Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>560</td> <th>880</th> <td>550</td> <td>991</td> | Magnesium | ppm | ASTM D5185m | 560 | 880 | 550 | 991 | |
| Zinc ppm ASTM D5185m 870 1194 913 1491 Sulfur ppm ASTM D5185m 2040 2671 2324 4128 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m 17 5 8 Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 Coxidation Abs/.1mm <t< td=""><td>Calcium</td><td>ppm</td><td>ASTM D5185m</td><td>1510</td><th>1016</th><td>1411</td><td>1587</td></t<> | Calcium | ppm | ASTM D5185m | 1510 | 1016 | 1411 | 1587 | |
| Sulfur ppm ASTM D5185m 2040 2671 2324 4128 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m >20 6 2 2 Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Phosphorus | ppm | ASTM D5185m | 780 | 998 | 752 | 1234 | |
| CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m 17 5 8 Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Zinc | ppm | ASTM D5185m | 870 | 1194 | 913 | 1491 | |
| Silicon ppm ASTM D5185m >25 2 2 5 Sodium ppm ASTM D5185m 17 5 8 Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | | | ASTM D5185m | 2040 | 2671 | 2324 | 4128 | |
| Sodium ppm ASTM D5185m 17 5 8 Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 Soot % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | CONTAMINAN | TS | method | limit/base | current | history1 | history2 | |
| Potassium ppm ASTM D5185m >20 6 2 2 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Silicon | ppm | ASTM D5185m | >25 | 2 | | 5 | |
| INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Sodium | ppm | ASTM D5185m | | 17 | 5 | 8 | |
| Soot % % *ASTM D7844 >3 1.5 0 0.3 Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Potassium | ppm | ASTM D5185m | >20 | 6 | 2 | 2 | |
| Nitration Abs/cm *ASTM D7624 >20 10.1 8.4 8.6 Sulfation Abs/.1mm *ASTM D7615 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | INFRA-RED | | method | limit/base | current | history1 | history2 | |
| Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.8 19.4 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Soot % | % | *ASTM D7844 | >3 | 1.5 | 0 | 0.3 | |
| FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Nitration | Abs/cm | *ASTM D7624 | >20 | 10.1 | 8.4 | 8.6 | |
| Oxidation Abs/.1mm *ASTM D7414 >25 16.5 16.2 16.1 | Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 20.9 | 18.8 | 19.4 | |
| | FLUID DEGRAD | ATION | method | limit/base | current | history1 | history2 | |
| Base Number (BN) mg KOH/g ASTM D2896 10.2 8.7 8.0 7.8 | Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 16.5 | 16.2 | 16.1 | |
| | Base Number (BN) | mg KOH/g | ASTM D2896 | 10.2 | 8.7 | 8.0 | 7.8 | |



OIL ANALYSIS REPORT

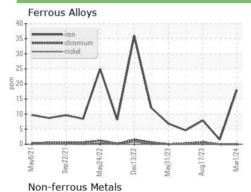


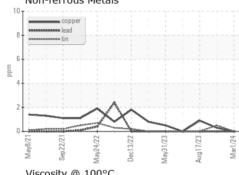


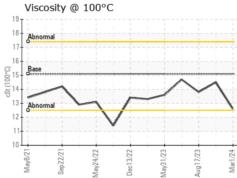
| VISUAL | | method | limit/base | current | history1 | history2 |
|-------------------------|--------|---------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | 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 |

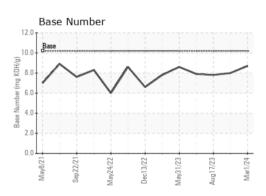
| FLUID PROPE | ERTIES | method | | | | history2 |
|--------------|--------|-----------|------|------|------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 15.1 | 12.6 | 14.5 | 13.8 |

GRAPHS













Laboratory Sample No.

: GFL0106994 Lab Number : 06109131 Unique Number: 10912628 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 05 Mar 2024 **Tested** : 06 Mar 2024

Diagnosed : 07 Mar 2024 - Sean Felton

GFL Environmental - 882 - Gainesville

5002 SW 41st Blvd Gainesville, FL US 32608

Contact: ROBERT CLARK robert.clark@gflenv.com

Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

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

T:

F: