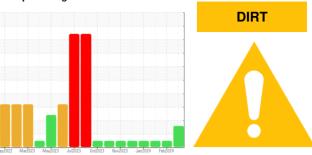


OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

721018-361460

Component

Diesel Engine

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

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor. Note that there appears to be a discrepancy in the total time on this component, when compared to the historical data.

Wear

All component wear rates are normal.

Contamination

Elemental level of silicon (Si) above normal.

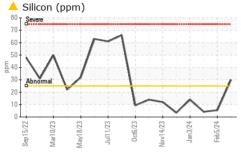
Fluid Condition

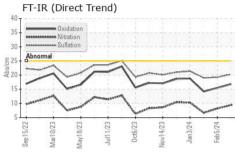
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

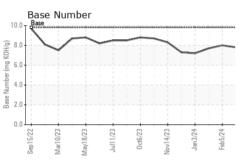
| Sample Number Client Info GFL0104797 GFL0104938 GFL010490 Sample Date Client Info 04 Apr 2024 05 Feb 2024 05 Feb 2024 25 Jan 2024 15 Jan 2024 | AL) | | Sep 2022 Mar. | 2023 May2023 Jul2023 | Oct2023 Nov2023 Jan2024 | Feb 2024 | |
|--|------------------|---|---------------|----------------------|-------------------------|-------------|-------------|
| Sample Date | SAMPLE INFORM | MATION | method | limit/base | current | history1 | history2 |
| Machine Age hrs Client Info 15172 1308 1211 Oil Age hrs Client Info 15172 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status Model NEG NEG NEG NEG Fuel WC Method 5 <1.0 | Sample Number | | Client Info | | GFL0104797 | GFL0104938 | GFL0104907 |
| Oil Age hrs Client Info 15172 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status ABNORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <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 | Sample Date | | Client Info | | 04 Apr 2024 | 05 Feb 2024 | 25 Jan 2024 |
| Dil Changed Client Info N/A ABNORMAL NORMAL NORMAL | Machine Age | hrs | Client Info | | 15172 | 1308 | 1211 |
| CONTAMINATION method fimit/base current history1 history2 | Oil Age | hrs | Client Info | | 15172 | 0 | 0 |
| CONTAMINATION | Oil Changed | | Client Info | | N/A | N/A | N/A |
| Fuel | Sample Status | | | | ABNORMAL | NORMAL | NORMAL |
| Water Glycol WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 69 16 9 Chromium ppm ASTM D5185m >20 13 2 1 Nickel ppm ASTM D5185m >4 4 1 0 <1 | CONTAMINATI | ION | method | limit/base | current | history1 | history2 |
| Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 69 16 9 Chromium ppm ASTM D5185m >20 13 2 1 Nickel ppm ASTM D5185m >4 <1 0 <1 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >30 3 2 1 Clead ppm ASTM D5185m >40 4 2 2 2 Copper ppm ASTM D5185m >33 3 2 1 Cadadium ppm ASTM D5185m <1 0 0 0 ADDITIVES method limit/base current history1 history2 | Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 13 2 1 Chromium ppm ASTM D5185m >20 13 2 1 Nickel ppm ASTM D5185m >20 13 2 1 Titanium ppm ASTM D5185m >3 0 0 0 Alluminum ppm ASTM D5185m >3 0 0 0 Alluminum ppm ASTM D5185m >20 5 2 2 Lead ppm ASTM D5185m >20 4 2 2 2 Copper ppm ASTM D5185m >40 4 2 2 2 Lead ppm ASTM D5185m >33.0 3 2 1 1 Copper ppm ASTM D5185m >1 1 0 0 0 1 1 1 1 | Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Iron | Glycol | | WC Method | | NEG | NEG | NEG |
| Chromium ppm ASTM D5185m >20 13 2 1 Nickel ppm ASTM D5185m >4 <1 | WEAR METALS | S | method | limit/base | current | history1 | history2 |
| Nickel | Iron | ppm | ASTM D5185m | >100 | 69 | 16 | 9 |
| Titanium | Chromium | ppm | ASTM D5185m | >20 | 13 | 2 | 1 |
| Silver | Nickel | ppm | ASTM D5185m | >4 | <1 | | <1 |
| Aluminum ppm ASTM D5185m >20 5 2 2 Lead ppm ASTM D5185m >40 4 2 2 Copper ppm ASTM D5185m >330 3 2 1 Tin ppm ASTM D5185m >15 3 2 1 Vanadium ppm ASTM D5185m <1 | | ppm | | | <1 | 0 | |
| Lead ppm ASTM D5185m >40 4 2 2 Copper ppm ASTM D5185m >330 3 2 1 Tin ppm ASTM D5185m >15 3 2 1 Vanadium ppm ASTM D5185m <1 | | ppm | | | | | |
| Copper ppm ASTM D5185m >330 3 2 1 Tin ppm ASTM D5185m >15 3 2 1 Vanadium ppm ASTM D5185m <1 | Aluminum | ppm | ASTM D5185m | | - | | |
| Tin ppm ASTM D5185m >15 3 2 1 Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 1 1 <1 Barium ppm ASTM D5185m 0 0 1 0 0 Molybdenum ppm ASTM D5185m 60 65 57 56 Manganese ppm ASTM D5185m 0 2 1 1 Magnesium ppm ASTM D5185m 1010 1009 971 854 Calcium ppm ASTM D5185m 1070 1193 1002 957 Phosphorus ppm ASTM D5185m 1150 1082 1012 963 Zinc ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 30 6 4 Sodium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % "ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/.tmm "ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm "ASTM D7414 >25 16.8 15.5 14.2 | Lead | ppm | | | | | |
| Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 1 <1 Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 0 <1 0 0 Manganese ppm ASTM D5185m 0 2 <1 1 Magnesium ppm ASTM D5185m 1010 1009 971 854 Calcium ppm ASTM D5185m 1070 1193 1002 957 Phosphorus ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 | • • | ppm | | >330 | - | | |
| Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 1 <1 | | • | | >15 | | | |
| ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 1 <1 | | ppm | | | | | |
| Boron | | ppm | ASTM D5185m | | <1 | 0 | 0 |
| Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 60 65 57 56 Manganese ppm ASTM D5185m 0 2 <1 | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 60 65 57 56 Manganese ppm ASTM D5185m 0 2 <1 1 Magnesium ppm ASTM D5185m 1010 1009 971 854 Calcium ppm ASTM D5185m 1070 1193 1002 957 Phosphorus ppm ASTM D5185m 1150 1082 1012 963 Zinc ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 30 6 4 Sodium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 | Boron | ppm | ASTM D5185m | 0 | 0 | | |
| Manganese ppm ASTM D5185m 0 2 <1 1 Magnesium ppm ASTM D5185m 1010 1009 971 854 Calcium ppm ASTM D5185m 1070 1193 1002 957 Phosphorus ppm ASTM D5185m 1150 1082 1012 963 Zinc ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 30 6 4 Sodium ppm ASTM D5185m >20 4 1 3 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 <th< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td></td><td>0</td><td>0</td></th<> | Barium | ppm | ASTM D5185m | 0 | | 0 | 0 |
| Magnesium ppm ASTM D5185m 1010 1009 971 854 Calcium ppm ASTM D5185m 1070 1193 1002 957 Phosphorus ppm ASTM D5185m 1150 1082 1012 963 Zinc ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 30 6 4 Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/:nm *ASTM D7415 | Molybdenum | | | | | 57 | |
| Calcium ppm ASTM D5185m 1070 1193 1002 957 Phosphorus ppm ASTM D5185m 1150 1082 1012 963 Zinc ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 30 6 4 Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base | • | ppm | ASTM D5185m | | 2 | <1 | |
| Phosphorus ppm ASTM D5185m 1150 1082 1012 963 Zinc ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 30 6 4 Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td></td> <td>971</td> <td></td> | Magnesium | ppm | ASTM D5185m | | | 971 | |
| Zinc ppm ASTM D5185m 1270 1309 1239 1150 Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 30 6 4 Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 | | ppm | ASTM D5185m | 1070 | | 1002 | |
| Sulfur ppm ASTM D5185m 2060 3334 3066 2828 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 30 6 4 Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | | ppm | | | | | |
| CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 30 6 4 Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | - | ppm | ASTM D5185m | | | | |
| Silicon ppm ASTM D5185m >25 ▲ 30 6 4 Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | | | ASTM D5185m | 2060 | 3334 | 3066 | 2828 |
| Sodium ppm ASTM D5185m 32 19 15 Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | CONTAMINAN | TS | | limit/base | current | history1 | history2 |
| Potassium ppm ASTM D5185m >20 4 1 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | Silicon | ppm | ASTM D5185m | >25 | △ 30 | 6 | 4 |
| INFRA-RED | Sodium | ppm | ASTM D5185m | | 32 | 19 | 15 |
| Soot % % *ASTM D7844 >3 0.7 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | Potassium | ppm | ASTM D5185m | >20 | 4 | 1 | 3 |
| Nitration Abs/cm *ASTM D7624 >20 9.4 8.2 6.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | INFRA-RED | | method | limit/base | current | history1 | history2 |
| Sulfation Abs/.1mm *ASTM D7415 >30 20.3 19.2 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | Soot % | % | *ASTM D7844 | >3 | 0.7 | 0.5 | 0.4 |
| FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | Nitration | Abs/cm | *ASTM D7624 | >20 | 9.4 | 8.2 | 6.7 |
| Oxidation Abs/.1mm *ASTM D7414 >25 16.8 15.5 14.2 | Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 20.3 | 19.2 | 19.0 |
| | FLUID DEGRAD | OATION | method | limit/base | current | history1 | history2 |
| Base Number (BN) mg KOH/g ASTM D2896 9.8 7.8 8.0 7.7 | Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 16.8 | 15.5 | 14.2 |
| | Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | 7.8 | 8.0 | 7.7 |

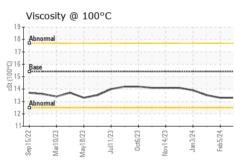


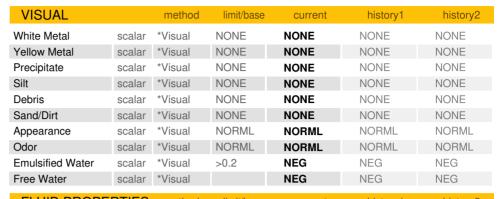
OIL ANALYSIS REPORT





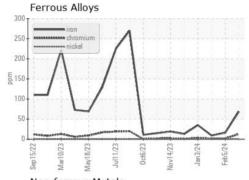


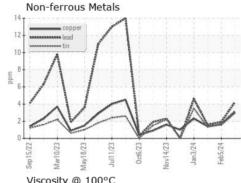


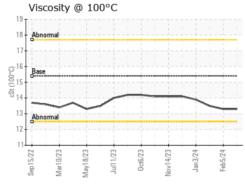


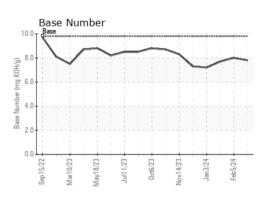
| FLUID PROPE | RHES | method | limit/base | current | history1 | history2 |
|--------------|------|-----------|------------|---------|----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | 13.3 | 13.3 | 13.5 |

GRAPHS













Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Lab Number : 06143650 Unique Number : 10968458

: GFL0104797 Test Package : FLEET

Received : 09 Apr 2024 Tested : 10 Apr 2024 Diagnosed

: 12 Apr 2024 - Don Baldridge

GFL Environmental - 820 - Joplin Hauling 3700 West 7th Street

Joplin, MO US 64801

Contact: James Jarrett jjarrett@gflenv.com T: (417)310-2802

Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369.

 st - 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)