

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 727022

Component Diesel Engine

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

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

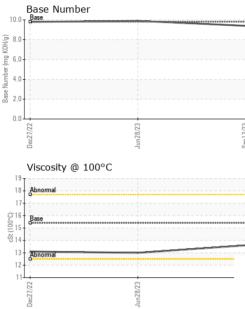
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| SAMPLE INFORM | MATION | method | limit/base | current | history1 | history2 |
|--|--|---|---|--|---|---|
| Sample Number | | Client Info | | GFL0092934 | GFL0015784 | GFL0067634 |
| Sample Date | | Client Info | | 12 Sep 2023 | 28 Jun 2023 | 27 Dec 2022 |
| Machine Age | hrs | Client Info | | 13172 | 12880 | 12192 |
| Oil Age | hrs | Client Info | | 12880 | 12192 | 0 |
| Oil Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | NORMAL | ABNORMAL | ABNORMAL |
| CONTAMINATI | ON | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METALS | S | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >100 | 12 | 41 | 37 |
| Chromium | ppm | ASTM D5185m | >20 | 1 | 3 | <1 |
| Nickel | ppm | ASTM D5185m | | <1 | 1 | 0 |
| Titanium | ppm | ASTM D5185m | | <1 | 2 | 0 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 2 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 1 | 6 | 4 |
| Lead | ppm | ASTM D5185m | >40 | <1 | 4 | 0 |
| Copper | ppm | | >330 | <1 | 3 | 2 |
| Tin | ppm | | >15 | 1 | 2 | _ <1 |
| Vanadium | ppm | ASTM D5185m | - | 0 | 1 | 0 |
| Cadmium | ppm | ASTM D5185m | | <1 | 2 | 0 |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | 0 | 4 | 14 | 91 |
| Barium | ppm | ASTM D5185m | 0 | 44 | 0 | 0 |
| | | | | 57 | | |
| Molybdenum | ppm | ASTM D5185m | 60 | 57 | 69 | 71 |
| Molybdenum Manganese | ppm ppm | ASTM D5185m ASTM D5185m | | 1 | 69 2 | 71 <1 |
| - | | | | - | | |
| Manganese | ppm | ASTM D5185m | 0 | 1 | 2 | <1 |
| Manganese Magnesium | ppm ppm | ASTM D5185m ASTM D5185m | 0 1010 | 1 857 | 2 926 | <1 826 |
| Manganese Magnesium Calcium | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 | 1 857 938 | 2 926 1080 | <1 826 1104 |
| Manganese Magnesium Calcium Phosphorus | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 | 1 857 938 908 | 2 926 1080 965 | <1 826 1104 948 |
| Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 | 1 857 938 908 1118 3193 | 2 926 1080 965 1222 | <1 826 1104 948 1128 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 2060 limit/base | 1 857 938 908 1118 3193 | 2 926 1080 965 1222 3518 | <1 826 1104 948 1128 3489 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 2060 limit/base | 1 857 938 908 1118 3193 current | 2 926 1080 965 1222 3518 history1 | <1 826 1104 948 1128 3489 history2 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN ^T Silicon | ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | 0 1010 1070 1150 1270 2060 limit/base | 1 857 938 908 1118 3193 current 4 | 2 926 1080 965 1222 3518 history1 12 | <1 826 1104 948 1128 3489 history2 5 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium | ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 2060 limit/base >25 | 1 857 938 908 1118 3193 current 4 28 5 | 2 926 1080 965 1222 3518 history1 12 ▲ 418 | <1 826 1104 948 1128 3489 history2 5 5 ▲ 128 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 2060 limit/base >25 >20 | 1 857 938 908 1118 3193 current 4 28 5 | 2 926 1080 965 1222 3518 history1 12 12 ▲ 418 17 | <1 826 1104 948 1128 3489 history2 5 5 128 9 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 | 1 857 938 908 1118 3193 current 4 28 5 5 current | 2 926 1080 965 1222 3518 history1 12 ▲ 418 17 history1 | <1 826 1104 948 1128 3489 bistory2 5 ▲ 128 9 bistory2 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % | ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 | 1 857 938 908 1118 3193 current 4 28 5 5 current 0.4 | 2 926 1080 965 1222 3518 history1 12 ↓ 418 17 history1 1 | <1 826 1104 948 1128 3489 bistory2 5 ▲ 128 9 bistory2 0.9 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 1010 1070 1150 1270 2060 limit/base >20 limit/base >3 >20 | 1 857 938 908 1118 3193 current 4 28 5 current 0.4 6.0 | 2 926 1080 965 1222 3518 history1 12 ▲ 418 17 history1 1 1 10.8 | <1 826 1104 948 1128 3489 history2 5 ▲ 128 9 history2 0.9 9.4 |
| Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7845 | 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20 >30 | 1 857 938 908 1118 3193 <u>current</u> 4 28 5 <u>current</u> 0.4 6.0 17.3 | 2 926 1080 965 1222 3518 history1 12 ▲ 418 17 history1 1 10.8 20.7 | <1 826 1104 948 1128 3489 bistory2 5 128 9 bistory2 0.9 9.4 19.7 |

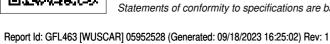


OIL ANALYSIS REPORT

VISUAL



| | White Metal | scalar | *Visual | NONE | NONE | NONE | NONE | | |
|---|---|--|-------------------------|------------------------------|----------------|---|---------------------------|--|--|
| | Yellow Metal | | *Visual | NONE | NONE | NONE | NONE | | |
| | Precipitate | | *Visual | NONE | NONE | NONE | NONE | | |
| | Silt | | *Visual | NONE | NONE | NONE | NONE | | |
| | Debris | | *Visual | NONE | NONE | NONE | NONE | | |
| | Sand/Dirt | | *Visual | NONE | NONE | NONE | NONE | | |
| 8/23 - | Appearance | | *Visual | NORML | NORML | NORML | NORML | | |
| Jun 28/23 Sep 1 2/23 | Odor | | *Visual | NORML | NORML | NORML | NORML | | |
| °C | Emulsified Water | | *Visual | >0.2 | NEG | NEG | NEG | | |
| | Free Water | | *Visual | | NEG | NEG | NEG | | |
| | FLUID PROPE | | method | limit/base | current | history1 | history2 | | |
| | Visc @ 100°C | | ASTM D445 | | 13.6 | 13.0 | 13.1 | | |
| | GRAPHS | COL | A31101 D443 | 15.4 | 15.0 | 15.0 | 15.1 | | |
| | Ferrous Alloys | | | | | | | | |
| | ⁴⁵ | | | | | | | | |
| 8/23 - | 40 - iron | 1 | | | | | | | |
| Jun 28/23 | 35 | | | | | | | | |
| | | | | | | | | | |
| | E ²⁵ 20 | | | | | | | | |
| | 15 | | | | | | | | |
| | 10- | | | | | | | | |
| | | 10000000000000000000000000000000000000 | August 6 | | | | | | |
| |)ec21/22 - | un28/23 - | | Sep12/23 - | | | | | |
| | Dec2 | Jun2 | | Sep 1 | | | | | |
| | Non-ferrous Metals | s | | | | | | | |
| | 10 copper | | | | | | | | |
| | 8 - management lead | | | | | | | | |
| | un | | | | | | | | |
| | 6 | | | | | | | | |
| | 4 | | | | | | | | |
| | and the second se | | No. of Concession, Name | | | | | | |
| | 2- | and the second sec | | | | | | | |
| | 0 | | | | | | | | |
| | 0ec27/22 | Jun28/23 | | Sep 12/23 | | | | | |
| | | , | | Sep | | | | | |
| | Viscosity @ 100°C Base Number | | | | | | | | |
| | 18 - Abnormal | | | 10.0 | Base | | | | |
| | 17+ | | | - 8.0 | | | | | |
| | | | | KOH/g | | | | | |
| | () 16 Base 115 15 14 | | | -0.0 6.0- 4.0- 4.0- | | | | | |
| ć | vi 14- | | | aq m 4.0- | | | | | |
| | 13 - Abnormal | | | gase | | | | | |
| | 12 | | | ° 2.0- | | | | | |
| | 11 | | | 0.0 | 2 | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | | | |
| | Dec27/22 | Jun28/23 | | Sep12/23 | Dec27/22 | Jun28/23 | Sep 12/23 | | |
| | De | ηr | | S. | Ď | ٦٢ | S | | |
| Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 463 - Cheboyg | | | | | | | | | |
| ANAR Sample No. | : GFL0092934 F | Received : 15 Sep 2023 | | | | 501 N. Western Ave | | | |
| Lab Number | | Diagnose | | Sep 2023 | | Cł | neboygan, MI | | |
| Certificate L2367 Unique Number | : 10648487 [: FLEET | Diagnosti | cian : wes | s Davis | | Conta | US 49721 ct: Chris Gee | | |
| To discuss this sample report, of | | ice at 1-80 | 00-237-1369 |). | | | @gflenv.com | | |
| * - Denotes test methods that a | re outside of the ISO 12 | 7025 scop | be of accred | itation. | | | 31)597-8553 | | |
| Statements of conformity to speci | ifications are based on th | he simple a | acceptance o | lecision rule (J | ICGM 106:2012) | | F: | | |



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Submitted By: GFL463 and GFL641 - DYLAN TOLAN