

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 913099

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

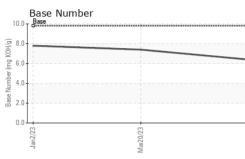
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

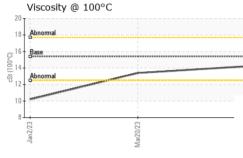
| SAMPLE INFORI | MATION | method | limit/base | current | history 1 | history 2 |
|---|--|---|--|---|--|---|
| Sample Number | | Client Info | | GFL0084562 | GFL0071468 | GFL0071452 |
| Sample Date | | Client Info | | 14 Jun 2023 | 20 Mar 2023 | 02 Jan 2023 |
| Machine Age | hrs | Client Info | | 1746 | 1154 | 611 |
| Oil Age | hrs | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | NORMAL | NORMAL | ATTENTION |
| CONTAMINAT | ION | method | limit/base | current | history 1 | history 2 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | 0.5 |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METAL | S | method | limit/base | current | history 1 | history 2 |
| Iron | ppm | ASTM D5185m | >100 | 17 | 16 | 35 |
| Chromium | ppm | ASTM D5185m | >20 | 1 | <1 | 1 |
| Nickel | ppm | ASTM D5185m | >4 | 2 | 4 | 11 |
| Titanium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Silver | ppm | ASTM D5185m | >3 | <1 | 1 | 2 |
| Aluminum | ppm | ASTM D5185m | >20 | 6 | 1 | 4 |
| Lead | ppm | ASTM D5185m | >40 | 3 | 0 | 2 |
| Copper | ppm | ASTM D5185m | >330 | 19 | 26 | 122 |
| Tin | ppm | | >15 | 3 | 1 | 4 |
| Vanadium | ppm | ASTM D5185m | 210 | <1 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| | ppm | | | ·· | - | |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history 1 | history 2 |
| Boron | ppm | ASTM D5185m | 0 | 4 | 12 | 239 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | 0 | 4 0 | 12 0 | 239 0 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 | 4 0 68 | 12 0 68 | 239 0 116 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 | 4 0 68 2 | 12 0 68 1 | 239 0 116 4 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 | 4 0 68 2 1084 | 12 0 68 1 956 | 239 0 116 4 732 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 | 4 0 68 2 1084 1200 | 12 0 68 1 956 1158 | 239 0 116 4 732 1482 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 | 4 0 68 2 1084 1200 1092 | 12 0 68 1 956 1158 1004 | 239 0 116 4 732 1482 682 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 | 4 0 68 2 1084 1200 1092 1378 | 12 0 68 1 956 1158 1004 1270 | 239 0 116 4 732 1482 682 890 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 | 4 0 68 2 1084 1200 1092 | 12 0 68 1 956 1158 1004 | 239 0 116 4 732 1482 682 890 2612 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 | 4 0 68 2 1084 1200 1092 1378 | 12 0 68 1 956 1158 1004 1270 | 239 0 116 4 732 1482 682 890 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 | 4 0 68 2 1084 1200 1092 1378 3486 | 12 0 68 1 956 1158 1004 1270 3367 | 239 0 116 4 732 1482 682 890 2612 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 | 4 0 68 2 1084 1200 1092 1378 3486 current | 12 0 68 1 956 1158 1004 1270 3367 history 1 | 239 0 116 4 732 1482 682 890 2612 history 2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 imit/base >25 | 4 0 68 2 1084 1200 1092 1378 3486 current 5 | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 | 239 0 116 4 732 1482 682 890 2612 history 2 71 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 imit/base >25 | 4 0 68 2 1084 1200 1092 1378 3486 <u>current</u> 5 4 | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 2 | 239 0 116 4 732 1482 682 890 2612 bistory 2 71 3 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 imit/base >25 | 4 0 68 2 1084 1200 1092 1378 3486 <u>current</u> 5 4 2 | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 2 1 | 239 0 116 4 732 1482 682 890 2612 history 2 71 3 5 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Imit/base >20 | 4 0 68 2 1084 1200 1092 1378 3486 <u>current</u> 5 4 2 2 | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 2 1 history 1 | 239 0 116 4 732 1482 682 890 2612 history 2 71 3 5 5 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Imit/base >20 | 4 0 68 2 1084 1200 1092 1378 3486 <u>current</u> 5 4 2 2 <u>current</u> | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 2 1 9 2 1 history 1 0.3 | 239 0 116 4 732 1482 682 890 2612 history 2 71 3 5 5 history 2 0.3 |
| Boron Barium Molybdenum 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 | 0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20 | 4 0 68 2 1084 1200 1092 1378 3486 <u>current</u> 5 4 2 2 <u>current</u> 0.5 9.9 | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 2 1 9 2 1 history 1 0.3 8.8 | 239 0 116 4 732 1482 682 890 2612 history 2 71 3 5 5 history 2 0.3 10.0 |
| Boron Barium Molybdenum 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 | 0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20 | 4 0 68 2 1084 1200 1092 1378 3486 <u>current</u> 5 4 2 2 <u>current</u> 0.5 9.9 22.7 | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 2 1 1 0.3 8.8 20.7 | 239 0 116 4 732 1482 682 890 2612 history 2 71 3 5 history 2 0.3 10.0 24.2 |
| Boron Barium Molybdenum 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 D7844 *ASTM D7844 *ASTM D7844 | 0 0 0 1010 1070 1150 1270 2060 imit/base >25 20 imit/base >3 >20 30 imit/base | 4 0 68 2 1084 1200 1092 1378 3486 <i>current</i> 5 4 2 <i>current</i> 0.5 9.9 22.7 | 12 0 68 1 956 1158 1004 1270 3367 history 1 9 2 1 9 2 1 1 0.3 8.8 20.7 history 1 | 239 0 116 4 732 1482 682 890 2612 history 2 71 3 5 history 2 0.3 10.0 24.2 history 2 |



OIL ANALYSIS REPORT

VISUAL





| White Metal | | | | | | |
|------------------|--|--|--|---|--|---|
| white wetai | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | NONE |
| | | | | | NONE | NONE |
| Debris | scalar | | NONE | NONE | NONE | NONE |
| | | | | | | NONE |
| | | | | | NORML | NORML |
| Odor | | | | | | NORML |
| | | | | | | NEG |
| | | | 20.L | | | NEG |
| | | | limit/base | | | history 2 |
| | | | | | | ▲ 10.2 |
| | | | | | 1011 | |
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| ³⁵ T | | | | | | |
| 30 - chromium | | | | | | |
| 25 - nickel | | | | | | |
| _ 20 | | | | | | |
| ā 15 | - | | | | | |
| 10 | | | | | | |
| C | | | | | | |
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| /3 | /23 | | /23 + | | | |
| Jan 2 | /lar20 | | Jun 14 | | | |
| Non-ferrous Meta | _ | | 7 | | | |
| ¹⁴⁰ T | | | | | | |
| 120 - copper | | | | | | |
| 100- | | | | | | |
| 80 | | | | | | |
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| 0 2 | 23 | ************************ | 23 | | | |
| Jan 2/ | 1ar20/ | | un14/ | | | |
| | | | | | | |
| ¹⁹ T | - | | 10.0 | Base Number Base | | |
| 18 - Abnormal | | | 10.0 | 0 | | |
| 17 | | | ₅ 8.0- | | | |
| Dase | | | KOH/ | | | |
| 0014 | | | B 6.0 | 1 | | |
| to 13 Abnormal | | | .0- 5 4.0- | | | |
| 12 | | | ase N | | | |
| 11 | | | ⁶⁶ 2.0- | | | |
| 9 | | | 0.0 | | | |
| Jan2/23 | Mar20/23 - | | | Jan 2/23 . | Mar20/23 - | |
| 5 | /lar2 | | 2 | ar | Ir2 | |
| | Sand/Dirt Appearance Odor Emulsified Water Free Water Fluid PROPE Visc @ 100°C GRAPHS Ferrous Alloys | Debris scalar Sand/Dirt scalar Appearance scalar Odor scalar Emulsified Water scalar Free Water scalar Free Water scalar FLUID PROPERTIES Visc @ 100°C cSt GRAPHS Ferrous Alloys Copper Non-ferrous Metals Viscosity @ 100°C Viscosity @ 100°C | Debris scalar *Visual Sand/Dirt scalar *Visual Appearance scalar *Visual Codor scalar *Visual Emulsified Water scalar *Visual Free Water scalar *Visual FLUID PROPERTIES method Visc @ 100°C cSt ASTM D445 GRAPHS Ferrous Alloys CRAPHS Ferrous Metals Non-ferrous Metals Viscosity @ 100°C | Debris scalar *Visual NONE Sand/Dirt scalar *Visual NONE Appearance scalar *Visual NORML Odor scalar *Visual NORML Emulsified Water scalar *Visual >0.2 Free Water scalar *Visual >0.2 Non-ferrous Alloys Compared of the scalar *Visual *Vi | Debris scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NONE Appearance scalar *Visual NORML NORML Color scalar *Visual NORML NORML Emulsified Water scalar *Visual >0.2 NEG Free Water scalar *Visual >0.2 NEG More definition of the scalar *Visual >0.2 NEG Nor ferrous Alloys Compared the scalar *Visual *0.5 Nor ferrous Metals Compared the scalar *Visual *0.5 Nor ferrous Metals *0.5 Nor ferro | Debris scalar *Visual NONE NONE NONE NONE Sand/Dirt scalar *Visual NORML NORML NORML NORML Appearance scalar *Visual NORML NORML NORML NORML Emulsified Water scalar *Visual NORML NORML NORML NORML Emulsified Water scalar *Visual NORML NORML NORML NORML Visc @ 100°C cSt ASTM D445 15.4 14.2 13.4 GRAPHS Ferrous Alloys Viscosity @ 100°C Viscosity @ 100°C |

Contact/Location: David McCall - GFL918