

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

Machine Id 10036

Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (48 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

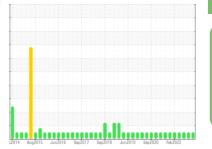
All component wear rates are normal.

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.



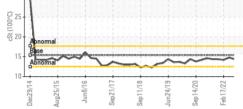


| SAMPLE INFOR | MATION | method | limit/base | current | history1 | history2 |
|---|---|---|---|--|---|--|
| Sample Number | | Client Info | | GFL0092692 | GFL0048862 | GFL0048826 |
| Sample Date | | Client Info | | 13 Sep 2023 | 23 Jan 2023 | 11 Jul 2022 |
| Machine Age | mls | Client Info | | 452630 | 13683 | 0 |
| Oil Age | mls | Client Info | | 186869 | 0 | 41 |
| Oil Changed | | Client Info | | Changed | N/A | Not Changd |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |
| CONTAMINAT | ION | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >3.0 | <1.0 | <1.0 | <1.0 |
| Glycol | | WC Method | , 010 | NEG | NEG | NEG |
| | 0 | _ | line it //s e e e | | | |
| WEAR METAL | | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >90 | 38 | 22 | 8 |
| Chromium | ppm | ASTM D5185m | >20 | 4 | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | 3 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | | 5 | 8 | 2 |
| Lead | ppm | ASTM D5185m | >40 | 1 | 2 | <1 |
| Copper | ppm | ASTM D5185m | >330 | 1 | 2 | <1 |
| Tin | ppm | ASTM D5185m | >15 | 2 | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| ADDITIVES | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | limit/base | current 3 | history1 12 | history2 13 |
| | ppm ppm | | 0 | | | |
| Boron | | ASTM D5185m | 0 | 3 | 12 | 13 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | 0 0 60 | 3 44 | 12 0 | 13 0 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 | 3 44 56 | 12 0 59 | 13 0 59 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 | 3 44 56 1 | 12 0 59 <1 | 13 0 59 <1 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 | 3 44 56 1 870 | 12 0 59 <1 880 | 13 0 59 <1 938 |
| 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 1150 | 3 44 56 1 870 1001 | 12 0 59 <1 880 1068 | 13 0 59 <1 938 1145 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 1010 1070 1150 1270 | 3 44 56 1 870 1001 929 | 12 0 59 <1 880 1068 971 | 13 0 59 <1 938 1145 991 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 1010 1070 1150 1270 | 3 44 56 1 870 1001 929 1149 | 12 0 59 <1 880 1068 971 1155 | 13 0 59 <1 938 1145 991 1200 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | 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 limit/base | 3 44 56 1 870 1001 929 1149 3226 | 12 0 59 <1 880 1068 971 1155 3501 | 13 0 59 <1 938 1145 991 1200 3728 |
| 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 ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 limit/base | 3 44 56 1 870 1001 929 1149 3226 current | 12 0 59 <1 880 1068 971 1155 3501 history1 | 13 0 59 <1 938 1145 991 1200 3728 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 | 3 44 56 1 870 1001 929 1149 3226 current 7 | 12 0 59 <1 880 1068 971 1155 3501 history1 25 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium | 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 method ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 | 3 44 56 1 870 1001 929 1149 3226 current 7 4 | 12 0 59 <1 880 1068 971 1155 3501 history1 25 15 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 3 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINAN Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base | 3 44 56 1 870 1001 929 1149 3226 current 7 4 4 | 12 0 59 <1 880 1068 971 1155 3501 history1 25 15 3 3 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 3 0 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base | 3 44 56 1 870 1001 929 1149 3226 current 7 4 4 4 | 12 0 59 <1 880 1068 971 1155 3501 history1 25 15 3 3 history1 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 3 0 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ypm ypm | ASTM D5185m ASTM D5185m | 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >6 >20 | 3 44 56 1 870 1001 929 1149 3226 <u>current</u> 7 4 4 4 <u>current</u> 1.3 | 12 0 59 <1 880 1068 971 1155 3501 history1 25 15 3 3 <u>history1</u> 0.6 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 3 0 history2 0.4 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration | <pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm</pre> | ASTM D5185m ASTM D5185m | 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >6 >20 | 3 44 56 1 870 1001 929 1149 3226 current 7 4 4 4 Current 1.3 7.3 | 12 0 59 <1 880 1068 971 1155 3501 history1 25 15 3 history1 0.6 7.6 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 3 0 history2 0.4 5.6 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | <pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm</pre> | ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >6 >20 >30 | 3 44 56 1 870 1001 929 1149 3226 <u>current</u> 7 4 4 4 <u>current</u> 1.3 7.3 19.6 | 12 0 59 <1 880 1068 971 1155 3501 history1 25 15 3 history1 0.6 7.6 19.5 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 3 0 history2 0.4 5.6 18.5 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAM | ppm ppm ppm ppm ppm ppm ppm ppm TTS ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D7844 *ASTM D7844 | 0 0 60 1010 1070 1150 1270 2060 limit/base >25 limit/base >6 >20 limit/base >6 >20 limit/base | 3 44 56 1 870 1001 929 1149 3226 current 7 4 4 4 current 1.3 7.3 19.6 current | 12 0 59 <1 880 1068 971 1155 3501 history1 25 15 3 15 3 history1 0.6 7.6 19.5 history1 | 13 0 59 <1 938 1145 991 1200 3728 history2 4 3 0 history2 0.4 5.6 18.5 history2 |



OIL ANALYSIS REPORT

Base Number 12.0 Base Number (mg KOH/g) 0.0 4.0 2.0 Base 0.0 Sep11/18 Jun24/19 Sep14/20 Dec29/14 Sep21/1 ua25/1 Viscosity @ 100°C 35 30



| | VISUAL | | method | limit/base | current | history1 | history2 | | | | | |
|--------------------------|---|----------------------|------------------------|------------------------------|---------------------------------|-------------------------------------|------------------------------|--|--|--|--|--|
| | White Metal | scalar | *Visual | NONE | NONE | NONE | NONE | | | | | |
| M- | 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 | | | | | |
| Sep14/20 Feb17/22 | Appearance | scalar | *Visual | NORML | NORML | NORML | NORML | | | | | |
| Feb | 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 | RTIES | method | limit/base | current | history1 | history2 | | | | | |
| | Visc @ 100°C | cSt | ASTM D445 | 15.4 | 14.5 | 13.9 | 14.4 | | | | | |
| | GRAPHS | | | | | | | | | | | |
| ~~~~ | Ferrous Alloys | | | | | | | | | | | |
| 20 | iron | | | | | | | | | | | |
| Sep 14/20 Feb 17/22 | 250 - nickel | | | | | | | | | | | |
| | 200 - | | | | | | | | | | | |
| 8 | 150 | | | | | | | | | | | |
| | 100- | | | | | | | | | | | |
| | 10 | | ٨ | | | | | | | | | |
| | 50 / M | | M | ./ | | | | | | | | |
| | | | | ~ | | | | | | | | |
| | Dec29/14 Aug25/15 Jun8/16 Sep21/17 | Sep 11/18 - | Jun24/19 Sep14/20 | 7// 10 | | | | | | | | |
| | | | Sep | E. | | | | | | | | |
| | Non-ferrous Metal | S | | | | | | | | | | |
| | copper | | District and | | | | | | | | | |
| | 100 - management lead | | | | | | | | | | | |
| | 80- | | ····· // ··· | | | | | | | | | |
| 80 | 60- | | | | | | | | | | | |
| c. | | 1111111 | 1 | | | | | | | | | |
| | 40- | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | 1 m | - | | | | | | | | |
| | Dec29/14 Aug25/15 Jun8/16 Sep21/17 | Sep11/18 | Jun24/19 Sep14/20 | 77/11 | | | | | | | | |
| | | | Jur Sep | 10 | | | | | | | | |
| | Viscosity @ 100°C | | | | Base Number | | | | | | | |
| | 30 | | | 12 | .0 _T | 1111111111 | | | | | | |
| | 30 | | | 10 | .0 - Base | | | | | | | |
| | | | | Base Number (mg KOH/g) 9. | 0 | / | Mr - | | | | | |
| | 25 | | | y Bm | | Mal | v | | | | | |
| | ž 20 - | | | mper 6 | | N | | | | | | |
| | Abnormal | | | IN 4 | | J | | | | | | |
| | 15 - Base | | ~~~ | ~ 2 | | | | | | | | |
| | Abnormal | ~~~ | | | lion lenichen | | | | | | | |
| | | /18 | /19 - | 0. 2 | | /17 /18 /19 | /20 - | | | | | |
| | Dec29/14 - Aug25/15 - Jun8/16 - Sep21/17 - | Sep11/18 | Jun 24/19 Sep 14/20 | | Dec29/14 Aug25/15 Jun8/16 | Sep 21/17 Sep 11/18 Jun 24/19 | Sep14/20 Feb17/22 | | | | | |
| | | | | | A | | | | | | | |
| aboratory | : WearCheck USA - 5 | | | | 3 GFL Enviro | | ilson/Tri-East(CNG) | | | | | |
| Sample No. Lab Number | | Received Diagnose | | Sep 2023 Sep 2023 | | 2810 Cont | entnea Road S Wilson, NC | | | | | |
| Jnique Number | | Diagnose | | Sep 2023 an Felton | | I | VVIISON, NC IS 27893-8501 | | | | | |
| Test Package | : FLEET | Linghost | | | | | NCER LIGGON | | | | | |
| | contact Customer Servi | ice at 1-8 | 00-237-136 | 9. | | | on@gflenv.com | | | | | |
| | re outside of the ISO 1 | | | | | | (800)207-6618 | | | | | |

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)

Certificate L2367

Submitted By: WALTER SKOKOWSKI

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