

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 4669M Component Diesel Engine Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

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.

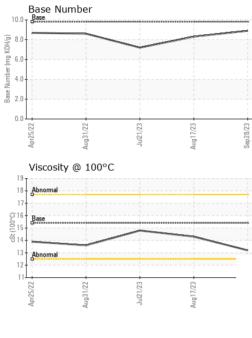
Fluid Condition

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 | history1 | history2 |
|---|--|--|---|--|--|--|
| Sample Number | | Client Info | | GFL0084984 | GFL0084867 | GFL0085029 |
| Sample Date | | Client Info | | 28 Sep 2023 | 17 Aug 2023 | 21 Jul 2023 |
| Machine Age | mls | Client Info | | 109287 | 106654 | 105173 |
| Oil Age | mls | Client Info | | 107806 | 1481 | 0 |
| Oil Changed | | Client Info | | N/A | N/A | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |
| CONTAMINAT | ION | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METALS | | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >80 | 3 | 5 | 16 |
| Chromium | ppm | ASTM D5185m | | 0 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | ۲ ۲ | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >3 | ۰ <1 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | | 2 | 0 | <1 |
| Lead | ppm | ASTM D5185m | >30 | 1 | 0 | 0 |
| Copper | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Tin | | ASTM D5185m | >5 | <1 | 0 | 0 |
| Vanadium | ppm ppm | ASTM D5185m | >0 | 0 | <1 | 0 |
| Cadmium | | ASTM D5185m | | 0 | 0 | 0 |
| | ppm | ASTIM D3103III | | 0 | 0 | 0 |
| | | | | | | biotory () |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | 0 | 4 | 2 | 4 |
| Boron Barium | ppm ppm | | 0 | 4 0 | 2 0 | 4 |
| Boron Barium Molybdenum | | ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 | 4 0 56 | 2 0 60 | 4 0 62 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | 0 0 60 | 4 0 | 2 0 60 <1 | 4 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 | 4 0 56 | 2 0 60 | 4 0 62 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 | 4 0 56 <1 | 2 0 60 <1 | 4 0 62 <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 | 4 0 56 <1 910 1029 1040 | 2 0 60 <1 979 | 4 0 62 <1 1011 |
| 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 56 <1 910 1029 | 2 0 60 <1 979 1126 | 4 0 62 <1 1011 1112 |
| 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 | 0 0 60 0 1010 1070 1150 | 4 0 56 <1 910 1029 1040 | 2 0 60 <1 979 1126 1031 | 4 0 62 <1 1011 1112 1065 |
| 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 56 <1 910 1029 1040 1234 | 2 0 60 <1 979 1126 1031 1252 | 4 0 62 <1 1011 1112 1065 1316 |
| 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 0 1010 1070 1150 1270 2060 | 4 0 56 <1 910 1029 1040 1234 3081 | 2 0 60 <1 979 1126 1031 1252 3628 | 4 0 62 <1 1011 1112 1065 1316 3488 |
| 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 56 <1 910 1029 1040 1234 3081 current | 2 0 60 <1 979 1126 1031 1252 3628 history1 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 |
| 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 method | 0 0 60 1010 1070 1150 1270 2060 kimit/base >20 | 4 0 56 <1 910 1029 1040 1234 3081 current 5 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 |
| 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 ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 kimit/base >20 | 4 0 56 <1 910 1029 1040 1234 3081 <u>current</u> 5 2 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 5 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 6 |
| 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 60 0 1010 1070 1150 1270 2060 Jimit/base >20 | 4 0 56 <1 910 1029 1040 1234 3081 current 5 2 2 2 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 5 <1 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 6 0 |
| 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 Imit/base >20 S 20 | 4 0 56 <1 910 1029 1040 1234 3081 <u>current</u> 5 2 2 2 2 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 5 <1 } | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 6 0 0 |
| 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 2060 220 20 20 20 20 | 4 0 56 <1 910 1029 1040 1234 3081 <u>current</u> 5 2 2 2 2 <u>current</u> 0.2 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 5 <1 3 5 <1 0.1 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 6 0 0 history2 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> >20 <i>limit/base</i> >3 >20 | 4 0 56 <1 910 1029 1040 1234 3081 current 5 2 2 2 2 current 0.2 5.7 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 5 <1 5 <1 history1 0.1 7.9 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 6 0 0 history2 0.3 13.2 |
| 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 D7624 | 0 0 0 1010 1070 1150 2060 2060 200 200 200 200 200 200 20 20 20 20 20 | 4 0 56 <1 910 1029 1040 1234 3081 <i>current</i> 5 2 2 2 <i>current</i> 0.2 5.7 17.6 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 5 <1 5 <1 0.1 7.9 19.2 history1 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 6 0 history2 0.3 13.2 23.4 history2 |
| 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 D7624 *ASTM D7415 | 0 0 0 1010 1070 1150 1270 2060 imit/base >20 imit/base >3 >20 >3 | 4 0 56 <1 910 1029 1040 1234 3081 <u>current</u> 5 2 2 2 2 <u>current</u> 0.2 5.7 17.6 | 2 0 60 <1 979 1126 1031 1252 3628 history1 3 5 <1 3 5 <1 0.1 7.9 19.2 | 4 0 62 <1 1011 1112 1065 1316 3488 history2 5 6 0 0 history2 0.3 13.2 23.4 |



OIL ANALYSIS REPORT



| | | VISUAL | | method | | | | 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 | |
| Jul21/23 | 7/23 - | Appearance | scalar | *Visual | NORML | NORML | NORML | NORML | |
| Jul2 | Aug 17/23 Sep 28/23 | 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 | limit/base | current | history1 | history2 | |
| | | Visc @ 100°C | cSt | ASTM D445 | 15.4 | 13.2 | 14.3 | 14.8 | |
| | | GRAPHS | | | | | | | |
| | | Ferrous Alloys | | | | | | | |
| 2 | 23 | 16 14 iron | \wedge | | | | | | |
| Jul21/23 | Aug17/23 | 12 | | 1 | | | | | |
| 7 | Aı | 10 | \ \ | | | | | | |
| | | Ed 8 | | \mathbf{i} | | | | | |
| | | 6- | | | | | | | |
| | | 4 | | | | | | | |
| | | 2 | | | | | | | |
| | | 0 | | Contract of Contract | annani Missensop | | | | |
| | | Apr25/22 Aug31/22 | Jul21/23 | Aug17/23 | Sep 28/23 | | | | |
| | | Apr | Jul | Aug | Sep | | | | |
| | | Non-ferrous Meta | als | | | | | | |
| | | 10 copper | | 1 | | | | | |
| | | 8 - Internet in the second sec | | | | | | | |
| | | | | | | | | | |
| | | E dd | | 1 | | | | | |
| | | 4 | | | | | | | |
| | | | | | | | | | |
| | | 2- | | | | | | | |
| | | | | AND DESCRIPTION OF THE OWNER. | ARRENTS- | | | | |
| | | Apr25/22 Aug31/22 | Jul21/23 | Aug17/23 | Sep 28/23 | | | | |
| | | 4 | | Aug | Sep | | | | |
| | | Viscosity @ 100° | С | | | Base Number | | | |
| | | 18 - Abnormal | | | 10.0 | Base | | | |
| | | 17 | | 1 | - 80 | | | | |
| | | | | | B/HO | | | | |
| | | Do 16 Base 15 15 15 | | | (0,H0) Base Mumher Base 2.0 | | | | |
| | | C IS | - | | mber 10 | | | | |
| | | 12 | | | se Nu | | | | |
| | | 13 Abnormal | 1 | 1 | 2.0 | | | | |
| | | 11 | | | | | | | |
| | | 5/22 | 1/23 | 7/23 - | | 5/22 | 1/23 - | 7/23 . | |
| | | Apr25/22 Aug31/22 | Jul21/23 | Aug17/23 . | Sep28/23 | Apr25/22 Aug31/22 | Jul21/23 | Aug17/23 | |
| | | | | | | | | | |
| | | | 501 Madie | on Ave Ca | rv NC 27513 | | | | |
| 4 | Laboratory | : WearCheck USA - | | | | | 000 | | |
| | Sample No. | : GFL0084984 | Received | d : 10 (| Oct 2023 | | 390 | 00 Van Born F | |
| | Sample No. Lab Number | : GFL0084984 : <mark>05974677</mark> | Received Diagnos | d :100 | Oct 2023 Oct 2023 | | 390 | 00 Van Born F Wayne, I | |
| TABLE L2367 | Sample No. | : GFL0084984 : 05974677 · : 10686627 | Received | d :100 | Oct 2023 | | | 00 Van Born F Wayne, I US 4818 t: Belal Dgheis | |