

OIL ANALYSIS REPORT

Sample Rating Trend



Area BARTO **Tokanine Id 7084 [BARTO]** Component **Diesel Engine** Fluid

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

Recommendation

Resample at the next service interval to monitor.

Wear

Metal levels are typical for a new component breaking in.

Contamination

There is no indication of any contamination in the oil.

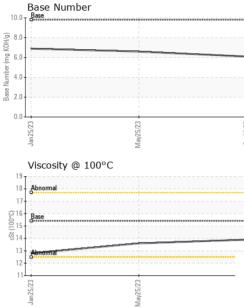
Fluid Condition

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

| | | | 11 1.0 | | | |
|---|---|---|---|--|---|--|
| SAMPLE INFORM | IATION | method | limit/base | current | history1 | history2 |
| Sample Number | | Client Info | | SBP0005623 | SBP0004383 | SBP0002188 |
| Sample Date | | Client Info | | 10 Oct 2023 | 25 May 2023 | 25 Jan 2023 |
| Machine Age | mls | Client Info | | 158136 | 117329 | 71745 |
| Oil Age | mls | Client Info | | 40807 | 41025 | 71745 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |
| CONTAMINATION | J | 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 | 25 | 37 | 44 |
| Chromium | ppm | ASTM D5185m | >5 | 2 | 3 | 3 |
| Nickel | ppm | ASTM D5185m | >2 | <1 | 1 | <1 |
| Titanium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Silver | ppm | ASTM D5185m | >3 | <1 | <1 | <1 |
| Aluminum | ppm | ASTM D5185m | | 9 | 13 | 18 |
| Lead | ppm | ASTM D5185m | >30 | 0 | 1 | <1 |
| Copper | ppm | ASTM D5185m | | 10 | 25 | 33 |
| Tin | ppm | ASTM D5185m | >5 | <1 | <1 | 1 |
| Vanadium | ppm | ASTM D5185m | 20 | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| | ppin | | | | | - |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | 0 | 2 | 4 | 12 |
| Barium | ppm | ASTM D5185m | 0 | 0 | 0 | 1 |
| Molybdenum | ppm | ASTM D5185m | 60 | 61 | 59 | 45 |
| Manganese | ppm | ASTM D5185m | 0 | 1 | 1 | 2 |
| Magnesium | ppm | ASTM D5185m | 1010 | 953 | 899 | 515 |
| Calcium | ppm | ACTM DE10Em | | | | |
| | ppm | ASTM D5185m | 1070 | 1106 | 1401 | 2041 |
| Phosphorus | ppm | ASTM D5185m ASTM D5185m | 1070 1150 | 1106 1021 | 1401 1011 | |
| Phosphorus Zinc | | | | | | 2041 |
| | ppm | ASTM D5185m | 1150 | 1021 | 1011 | 2041 911 |
| Zinc | ppm ppm | ASTM D5185m ASTM D5185m | 1150 1270 | 1021 1307 | 1011 1321 | 2041 911 1154 |
| Zinc Sulfur | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 1150 1270 2060 limit/base | 1021 1307 2354 | 1011 1321 2965 | 2041 911 1154 2928 |
| Zinc Sulfur CONTAMINANTS | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m method | 1150 1270 2060 limit/base | 1021 1307 2354 current | 1011 1321 2965 history1 | 2041 911 1154 2928 history2 |
| Zinc Sulfur CONTAMINANTS Silicon | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | 1150 1270 2060 limit/base >20 | 1021 1307 2354 current 7 | 1011 1321 2965 history1 7 | 2041 911 1154 2928 history2 9 |
| Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m | 1150 1270 2060 limit/base >20 | 1021 1307 2354 current 7 3 | 1011 1321 2965 history1 7 5 | 2041 911 1154 2928 history2 9 7 |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m | 1150 1270 2060 <i>limit/base</i> >20 >20 | 1021 1307 2354 current 7 3 17 | 1011 1321 2965 history1 7 5 25 | 2041 911 1154 2928 history2 9 7 36 |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 1150 1270 2060 imit/base >20 >20 imit/base | 1021 1307 2354 current 7 3 17 current | 1011 1321 2965 history1 7 5 25 history1 | 2041 911 1154 2928 history2 9 7 36 history2 |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 | 1150 1270 2060 imit/base >20 >20 imit/base >3 >20 | 1021 1307 2354 current 7 3 17 current 0.8 | 1011 1321 2965 history1 7 5 25 history1 0.8 | 2041 911 1154 2928 history2 9 7 36 history2 0.6 |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm kbs/cm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 *ASTM D7624 | 1150 1270 2060 imit/base >20 >20 imit/base >3 >20 | 1021 1307 2354 current 7 3 17 current 0.8 9.9 | 1011 1321 2965 history1 7 5 25 history1 0.8 10.4 | 2041 911 1154 2928 history2 9 7 36 history2 0.6 10.2 |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm kbs/cm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7844 | 1150 1270 2060 imit/base >20 >20 imit/base >30 >20 >30 | 1021 1307 2354 current 7 3 17 current 0.8 9.9 22.5 | 1011 1321 2965 history1 7 5 25 history1 0.8 10.4 23.2 | 2041 911 1154 2928 history2 9 7 36 history2 0.6 10.2 23.1 |



OIL ANALYSIS REPORT



| | VISUAL | | method | limit/base | current | history1 | 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 |
| | Appearance | scalar | *Visual | NORML | NORML | NORML | NORML |
| | Ödor | scalar | *Visual | NORML | NORML | NORML | NORML |
| | Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |
| | Free Water | scalar | *Visual | | NEG | NEG | NEG |
| | FLUID PROPER | RTIES | method | limit/base | current | history1 | history2 |
| | Visc @ 100°C | cSt | ASTM D445 | 15.4 | 13.9 | 13.6 | 12.8 |
| | GRAPHS | | | | | | |
| | Ferrous Alloys | | | | | | |
| | 40 - iron | | | | | | |
| | 35 - nickel | | | | | | |
| | 30 - | | | | | | |
| | e 25 20 | | | | | | |
| | 15 | | | | | | |
| | 10 | | | | | | |
| | 5 - | | | | | | |
| | 0 S | 23 | | 33 | | | |
| | lan 25/23 | May25/23 | | 0ct10/23 | | | |
| | , | | | 0 | | | |
| | Non-ferrous Met | .ais | | | | | |
| | 30 - copper | | | | | | |
| | 25 - tin | - | | | | | |
| | | | | | | | |
| | 20 15 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | 10 | | | \ | | | |
| | 10 | | | \ | | | |
| | 10 - 5 - 0 | 23 | | 23 | | | |
| | 10-5- | lay25/23 - | | Jeti 0/23 | | | |
| | | \geq | | 0ct10/23 | | | |
| | ¹⁰ ⁵ ⁶ ⁶ ⁶ ⁶ ⁶ ⁶ ⁶ ⁶ | \geq | | | Base Number | | |
| | 10 5 0 Viscosity @ 100 19 18 Abnormal | \geq | | 10.0 - | | | |
| | Viscosity @ 100 | N | | 10.0 - | | | |
| | Viscosity @ 100 | N | | 10.0 - | | | |
| | Viscosity @ 100 | N | | 10.0 - | | | |
| | Viscosity @ 100 | N | | 10.0 - | | | |
| | Viscosity @ 100 | N | | 0.0 - 10.0 4.0 - 10.0 بقر 10.0 - 10.0 سوتا | | | |
| | Viscosity @ 100' | °C | | 10.0 - (0,0) HOX (0,0) HOX (0,0) - (0,0) - | <u>Base</u> | | |
| | Viscosity @ 100' | °C | | 10.0 - (0,0) HOX (0,0) HOX (0,0) - (0,0) - | <u>Base</u> | | |
| | Viscosity @ 100' | N | | 10.0 - (0,0) HOX (0,0) HOX (0,0) - (0,0) - | | May25/23 | |
| Laboratory | Viscosity @ 100 | May25/23 | son Ave., Ca | -0.0 -0.8 -0.9 -0.9 -0.9 -0.9 -0.9 -0.9 -0.0 -0.0 | | | ATION - BAR |
| Laboratory Sample No. | Viscosity @ 100 Viscosity @ 100 | °C ECUSTINEM | d :13 | 10.0 (9)HOX But aquinn 4.0 (10)HOX But aquinn | | EZISZ/NEW DT TRANSPORTA | 08 E Bay Roa |
| Sample No. Lab Number | Viscosity @ 100 Viscosity @ 100 | ≥°C EZISZNEW - 501 Madia Received Diagnose | d :13 ed :16 | 10.0 (0)HOX 0 (0)HOX | | EZISZ/NEW DT TRANSPORTA | 08 E Bay Roa Plattsmouth, N |
| Sample No. | Viscosity @ 100 Viscosity @ 100 Viscosity @ 100 | °C ECUSTINEM | d :13 ed :16 | 10.0 (9)HOX But aquinn 4.0 (10)HOX But aquinn | | EZISZNEW DT TRANSPORTA 1 F | 08 E Bay Ro |