

OIL ANALYSIS REPORT

Sample Rating Trend





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.

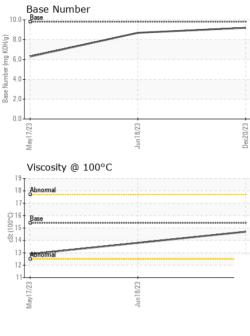
Fluid Condition

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 | history1 | history2 |
|--|--|--|---|---|---|--|
| Sample Number | | Client Info | | GFL0105849 | GFL0069809 | GFL0072943 |
| Sample Date | | Client Info | | 20 Dec 2023 | 18 Jun 2023 | 17 May 2023 |
| Machine Age | hrs | Client Info | | 15280 | 15233 | 15172 |
| Oil Age | hrs | Client Info | | 15280 | 600 | 520 |
| Oil Changed | | Client Info | | Not Changd | Changed | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |
| CONTAMINAT | ION | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >3.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METAL | S | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >120 | 0 | 2 | 31 |
| Chromium | ppm | ASTM D5185m | >20 | 0 | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | <1 | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | 0 | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | <1 | 6 | 15 |
| Lead | ppm | ASTM D5185m | >40 | 0 | 0 | <1 |
| Copper | ppm | ASTM D5185m | >330 | <1 | 3 | 36 |
| Tin | ppm | ASTM D5185m | >15 | 0 | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| O I I | | | | | | |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| ADDITIVES | ppm | ASTM D5185m method | limit/base | 0 current | 0 history1 | <1 history2 |
| | ppm ppm | method | limit/base | | - | |
| ADDITIVES | | method | | current | history1 | history2 |
| ADDITIVES Boron | ppm | method ASTM D5185m | 0 | current 4 | history1 6 | history2 4 |
| ADDITIVES Boron Barium | ppm ppm | method ASTM D5185m ASTM D5185m | 0 0 60 | current 4 0 | history1 6 0 | history2 4 0 |
| ADDITIVES Boron Barium Molybdenum | ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 | current 4 0 60 | history1 6 0 54 | history2 4 0 58 |
| ADDITIVES Boron Barium Molybdenum Manganese | ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 | current 4 0 60 <1 | history1 6 0 54 <1 | history2 4 0 58 1 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 | Current 4 0 60 <1 949 | history1 6 0 54 <1 946 | history2 4 0 58 1 944 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 | Current 4 0 60 <1 949 1037 | history1 6 0 54 <1 946 1041 | history2 4 0 58 1 944 1129 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 | Current 4 0 60 <1 949 1037 1130 | history1 6 0 54 <1 946 1041 1086 | history2 4 0 58 1 944 1129 1011 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 | Current 4 0 60 <1 949 1037 1130 1291 | history1 6 0 54 <1 946 1041 1086 1278 | history2 4 0 58 1 944 1129 1011 1252 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m 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 | Current 4 0 60 <1 949 1037 1130 1291 3247 | history1 6 0 54 <1 946 1041 1086 1278 3199 | history2 4 0 58 1 944 1129 1011 1252 3416 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN | ppm ppm ppm ppm ppm ppm ppm ppm ppm | method 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 | Current 4 0 60 <1 949 1037 1130 1291 3247 Current | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method 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 | Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5 | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 limit/base >25 | Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5 2 0 0 | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 ×1 ×1 ×1 ×1 ×1 ×1 ×1 history1 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm TS | method ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20 | Current 4 0 60 <1 949 1037 1130 1291 3247 current 5 2 0 current 0 | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 0.1 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20 | Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5 2 0 0 | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 ×1 ×1 ×1 ×1 ×1 ×1 ×1 history1 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20 | Current 4 0 60 <1 949 1037 1130 1291 3247 current 5 2 0 current 0 | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 0.1 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2 |
| ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sidium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20 | Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5 2 0 current 0 44.2 | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 -1 0.1 5.0 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2 8.5 |
| ADDITIVES 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 | method ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 25 20 220 20 20 20 20 20 20 20 20 20 20 20 | Current 4 0 60 <1 949 1037 1130 1291 3247 current 5 2 0 current 0 4.2 17.1 | history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 0.1 5.0 17.1 | history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2 8.5 19.9 |



OIL ANALYSIS REPORT



| | VISUAL | | method | | | 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 |
| | | | | | NONE | NONE | |
| 23 | Sand/Dirt | scalar | *Visual | NONE NORML | NORML | NORML | NONE |
| Dec20/23 | Appearance | scalar | *Visual *Visual | | | | |
| | Odor | scalar | | NORML | NORML | NORML | NORML |
| | Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |
| | Free Water | scalar | *Visual | 1 | NEG | NEG | NEG |
| | FLUID PROP Visc @ 100°C | cSt | method ASTM D445 | limit/base | current | history1 13.8 | history2 12.9 |
| | GRAPHS | CSI | ASTM D445 | 15.4 | 14.7 | 13.0 | 12.9 |
| | Ferrous Alloys | | | | | | |
| | 35 | | | | | | |
| | 30 - chromium | | | | | | |
| | 25 | | | | | | |
| | E 20 15 | | | | | | |
| | 15 | | | | | | |
| | 10 | | | | | | |
| | 5- | \mathbf{i} | | | | | |
| | 0 | | | | | | |
| | May17/23 | Jun18/23 | | Dec20/23 | | | |
| | May | Jun | | Dec | | | |
| | Non-ferrous Met | als | | | | | |
| | 40 copper | | | | | | |
| | | | | | | | |
| | 35 - sessesses lead | | | | | | |
| | 30 - second lead | | | | | | |
| | 30 25 | | | | | | |
| | 30 25 <u><u><u></u></u> 20</u> | | | | | | |
| | 30 30 25 20 15 | | | | | | |
| | 30 | | | | | | |
| | 30 30 25 20 15 | | | | | | |
| | sis and the second seco | ¹²³ | | /23 | | | |
| | 30 | un 18/23 | | Jec20/23 | | | |
| | 33 30 25 15 10 5 0 6 7 7 10 5 0 6 7 10 15 | | | Dec20/23 | | | |
| | sis and the second seco | | | | Base Number | - | |
| | Solution (19) (100) | | | | Base Number | | |
| | 15 0 Viscosity @ 100 | | | 10.1 | Base | | |
| | Solution (19) (10) (19) (10) (10) (10) (10) (10) (10) (10) (10 | | | 10.1 | Base | - | |
| | Solution (19) (10) (19) (10) (10) (10) (10) (10) (10) (10) (10 | | | 10.1 | Base | | |
| | Solution (19) (10) (19) (10) (10) (10) (10) (10) (10) (10) (10 | | | 10.1 | Base | | |
| | Viscosity @ 100 ¹⁹ Abnormal Abnormal Base | | | 10.1 | Base | - | |
| | Viscosity @ 100' | | | 10.1 (0, HOX) (0, MOH (0, MOH (0, MOH (0, MOH (0, MOH)) (0, MOH) (0, MOH) (| Base | | |
| | Abnormal | | | 10.1 8.1 9.0 0 KOH(0) 9.8 Winnipe 8.8 Winnipe 8.2.1 | Base | _ | |
| | Viscosity @ 100' | °C | | 10.1 (b)HOX 60.1 (b)HOX 60.1 (b)HOX 60.1 (b)HOX 60.1 (c) Base 8 2.0 (c) (c) (c) (c) (c) (c) (c) (c) (c) (c) | Base | | |
| | Abnormal | | | 10.1 8.1 9.0 0 KOH(0) 9.8 Winnipe 8.8 Winnipe 8.2.1 | Base | Junt 8/23 | |
| | Viscosity @ 100' | ۲ חווו 19/23 | | 10.1 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1 | Base EZULIARE W | Jun18/23 | |
| | Viscosity @ 100 Viscosity @ 100 Base Units Control Con | °C | | 10.1 (PHOX Bull section 4.1 (PHOX Bell section 4.1) (PHOX Bell sect | Base EZULIARE W | | |
| | Viscosity @ 100 ¹⁹ Abnormal CELLING Viscosity @ 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Example 100 ¹⁹ | • C | d : 22 | 10.1 (PHOX Put 4.1 Put 3 agunn 4.1 2.1 0.1 ECC07290 Unry, NC 27511 Dec 2023 | Base EZULIARE W | vironmental - 415 | 6200 Elmrid |
| | Viscosity @ 100 Viscosity @ 100 Base Units Control Con | - 501 Madia Recieved Diagnos | d : 22 ed : 26 | 10.1 (PHOX Bull section 4.1 (PHOX Bell section 4.1) (PHOX Bell sect | Base EZULIARE W | vironmental - 415 | 5 - Michigan E 6200 Elmrid ling Heights, US 483 |
| r | Viscosity @ 100 Viscosity @ 100 Viscosity @ 100 | • C | d : 22 ed : 26 | 10.1 (PHOX Put 4.1 (PHOX Put 4.1) (PHOX Put 4.1 (PHOX Put 4.1) (PHOX PUT 4.1) (| Base EZULIARE W | vironmental - 415 Ster | 6200 Elmrid ling Heights, |
| r ver ge | Viscosity @ 100 Viscosity @ 100 Viscosity @ 100 | - 501 Madia Recieved Diagnos Diagnos | d : 22 ed : 26 tician : We | 10.1 (Phyloy Bull 30 10.1 1 | Base EZULIARE W | vironmental - 415 Ster Conta fwol | 6200 Elmric ling Heights, US 483 |



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