

OIL ANALYSIS REPORT

MONTGOMERY **KENWORTH 426116**

Component **Diesel Engine**

Fluid PETRO CANADA DURON SHP 15W40 (--- LTR)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

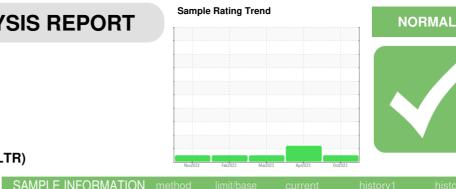
All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

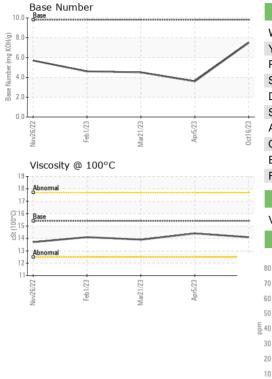
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



| SAMPLE INFORI | | method | limit/base | current | history1 | history2 |
|---|--|---|---|---|--|--|
| Sample Number | | Client Info | | GFL0092420 | GFL0078448 | GFL0075158 |
| Sample Date | | Client Info | | 16 Oct 2023 | 05 Apr 2023 | 21 Mar 2023 |
| Machine Age | hrs | Client Info | | 15993 | 15753 | 15610 |
| Oil Age | hrs | Client Info | | 240 | 273 | 130 |
| Oil Changed | | Client Info | | Changed | Changed | Not Changd |
| Sample Status | | | | NORMAL | ABNORMAL | NORMAL |
| CONTAMINAT | ION | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Glycol | | WC Method | >0 | NEG | NEG | NEG |
| | | WC Method | | NEG | NLG | NLG |
| WEAR METAL | S | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >100 | 24 | 74 | 73 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | 2 | 2 |
| Nickel | ppm | ASTM D5185m | >4 | <1 | <1 | <1 |
| Titanium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 3 | 5 | 8 |
| Lead | ppm | ASTM D5185m | >40 | 6 | 27 | 28 |
| Copper | ppm | ASTM D5185m | >330 | <1 | 3 | 3 |
| Tin | ppm | ASTM D5185m | >15 | <1 | 1 | 2 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| ADDITIVES | | method | limit/base | current | biotopul | history2 |
| ADDITIVES | | methou | | | | riistoryz |
| Boron | mqq | ASTM D5185m | 0 | 7 | 28 | 40 |
| | ppm ppm | ASTM D5185m | | 7 | | |
| Boron Barium | ppm | | 0 | | 28 | 40 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 0 | 7 0 72 | 28 0 | 40 0 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m | 0 0 60 | 7 0 72 0 | 28 0 102 | 40 0 110 |
| Boron Barium Molybdenum | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 | 7 0 72 | 28 0 102 1 | 40 0 110 1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 | 7 0 72 0 931 | 28 0 102 1 682 | 40 0 110 1 804 |
| Boron Barium Molybdenum Manganese Magnesium | 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 | 7 0 72 0 931 1188 | 28 0 102 1 682 1435 | 40 0 110 1 804 1649 937 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 1010 1070 | 7 0 72 0 931 1188 971 | 28 0 102 1 682 1435 848 | 40 0 110 1 804 1649 |
| 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 | 7 0 72 0 931 1188 971 1228 | 28 0 102 1 682 1435 848 1023 | 40 0 110 1 804 1649 937 1163 |
| 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 | 7 0 72 0 931 1188 971 1228 3210 current | 28 0 102 1 682 1435 848 1023 2362 history1 | 40 0 110 1 804 1649 937 1163 3387 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 ASTM D5185m | 0 0 60 1010 1070 1150 1270 2060 limit/base >25 | 7 0 72 0 931 1188 971 1228 3210 current 7 | 28 0 102 1 682 1435 848 1023 2362 history1 15 | 40 0 110 1 804 1649 937 1163 3387 history2 18 |
| 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 kimit/base >25 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 |
| 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 limit/base >25 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 14 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 limit/base >25 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 current | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 14 history1 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 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 TS ppm ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 20 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 current 0.4 | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 15 <1 14 history1 1 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 history2 1 |
| 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 TS 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 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 current 0.4 9.1 | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 15 <1 14 history1 1 1 13.6 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 history2 1 1 14.0 |
| 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 2060 225 >25 >20 20 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 current 0.4 | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 15 <1 14 history1 1 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 history2 1 |
| 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 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 current 0.4 9.1 | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 15 <1 14 history1 1 1 13.6 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 history2 1 1 14.0 |
| 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 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 6 current 0.4 9.1 20.1 | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 14 history1 1 13.6 29.1 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 history2 1 14.0 31.5 |
| 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 1270 2060 2060 225 20 220 220 20 3 20 20 3 3 20 20 3 3 20 20 20 20 20 20 20 20 20 20 20 20 20 | 7 0 72 0 931 1188 971 1228 3210 current 7 0 6 current 0.4 9.1 20.1 current | 28 0 102 1 682 1435 848 1023 2362 history1 15 <1 15 <1 14 14 history1 1 13.6 29.1 history1 | 40 0 110 1 804 1649 937 1163 3387 history2 18 2 13 history2 1 1 14.0 31.5 history2 |



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 |
| Mar21/23 | Apr5/23 | Appearance | scalar | *Visual | NORML | NORML | NORML | NORML |
| Mará | Ap | Ödor | scalar | *Visual | NORML | NORML | NORML | NORML |
| | | Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |
| | | Free Water | scalar | *Visual | | NEG | NEG | NEG |
| | | FLUID PROPI | ERTIES | method | limit/base | current | history1 | history2 |
| | | Visc @ 100°C | cSt | ASTM D445 | 15.4 | 14.1 | 14.4 | 13.9 |
| | | GRAPHS | | | | | | |
| | | Ferrous Alloys | | | | | | |
| 1/23 - | Арг5/23 - | 70 - iron | / | | | | | |
| Mar21/23 | Apré | 60 - nickel | | \sim | | | | |
| | | 50- | | \sim | | | | |
| | | <u>8</u> 40- | | | | | | |
| | | 30- | | | | | | |
| | | 20 | | | | | | |
| | | | | | | | | |
| | | | /23 - | /23 | 123 | | | |
| | | Vov26/22 Feb1/23 | Mar21/23 | Apr5/23 | 0ct16/23 | | | |
| | | ∠ Non-ferrous Meta | | | | | | |
| | | 30 ₁ | a15 | | | | | |
| | | 25 - copper | AND DECEMBER OF STREET, STREET | | | | | |
| | | management tin the second | | | | | | |
| | | 20- | | | | | | |
| | | 20 | | | | | | |
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| | | 톱 15- | | | | | | |
| | | | | | | | | |
| | | 톱 15- | | | | | | |
| | | EE 15- 10- 5- 0- | | | | | | |
| | | EE 15- 10- 5- 0- | 21/23 | | | | | |
| | | Nov26/22 0 5 10 151 | Mar21/23 | Apri5/23 | Octi6/23 | | | |
| | | EE 15- 10- 5- 0- | \geq | | 0ct16/23 | Base Number | | |
| | | Uiscosity @ 100° | \geq | | 0ct18/23 | 0 - Base | | |
| | | Uiscosity @ 100° | \geq | | 0ct18/23 | 0 - Base | | |
| | | Uiscosity @ 100° | \geq | | 0ct18/23 | 0 - Base | | |
| | | Uiscosity @ 100° | \geq | | 0ct18/23 | 0 - Base | | |
| | | Viscosity @ 100° 19 Abnomal 17 (| \geq | | 0ct18/23 | 0 - Base | | |
| | | Viscosity @ 100° 19 Abnomal 10 10 10 10 10 10 10 10 10 10 | \geq | | 0ct16/23 | 0 - Base | | |
| | | Viscosity @ 100° 19 Abnomal 17 (| \geq | | .01 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0) | 0 - Base | | |
| | | Viscosity @ 100° | ≥ C | Apr5/23 | 10. 8. 6. 8 . 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. | | | 73 |
| | | Viscosity @ 100° | ≥ C | | .01 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0) | | | Apri5/23 |
| | | Viscosity @ 100° | \geq | Apr5/23 | 10. 8. 6. 8 . 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. | 0 - Base 0 | Mar21/23 | |
| 4 | Laboratory | Viscosity @ 100° | C EZ/1728W 501 Madis | son Ave., Ca | сгорто сси сси сси сси сси сси сси сси сси сс | 0 - Base 0 | EZIJZEW vironmental - 95 | 55 - Montgome |
| NAB | Sample No. | Viscosity @ 100° Viscosity @ 100° Base Control 15 10 10 10 10 10 10 10 10 10 10 | C EZIIZEW 501 Madia Received | son Ave., Ca | сту, NC 2751 Сту, NC 2751 Ост 2023 | 0 - Base 0 | vironmental - 95 | 55 - Montgome 121 Wilbanks S |
| | Sample No. Lab Number | Viscosity @ 100° Viscosity @ 100° Viscosity @ 100° | C EZIIZEW 501 Madia Received Diagnose | son Ave., Ca d : 19 ed : 20 f | сту, NC 2751 Ост 2023 Ост 2023 | 0 - Base 0 | vironmental - 95 | 5 5 - Montgome 121 Wilbanks S Montgomery, A |
| | Sample No. Lab Number Unique Numbe | Viscosity @ 100° Viscosity @ 100° Viscosity @ 100° | C EZIIZEW 501 Madia Received | son Ave., Ca d : 19 ed : 20 f | сту, NC 2751 Сту, NC 2751 Ост 2023 | 0 - Base 0 | vironmental - 95 | 55 - Montgome 121 Wilbanks Montgomery, A US 3610 |
| tilicate L2367 discuss thi | Sample No. Lab Number Unique Number Test Packag | Viscosity @ 100° Viscosity @ 100° Viscosity @ 100° | C EZUIZZEW 501 Madia Received Diagnost | ECTYPHEN ECTYPHEN son Ave., Ca d : 19 ed : 20 tician : We | 10. (0)HOX 0u) Jaquing area (0)HOX 0u) Jaqui | 0 - Base 0 | vironmental - 95 | 5 5 - Montgome 121 Wilbanks S Montgomery, A |

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