

OIL ANALYSIS REPORT

Sample Rating Trend





428061-402360 Component Diesel Engine

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.

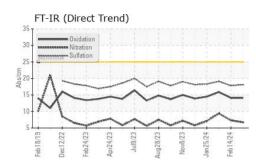
Fluid Condition

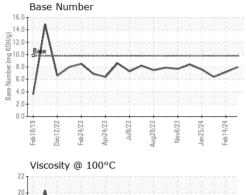
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

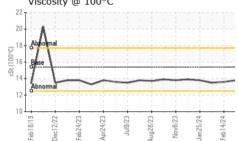
| SAMPLE INFORI | MATION | method | limit/base | current | history1 | history2 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Number | | Client Info | | GFL0104824 | GFL0104961 | GFL0104885 |
| Sample Date | | Client Info | | 10 Apr 2024 | 14 Feb 2024 | 05 Feb 2024 |
| Machine Age | mls | Client Info | | 353493 | 343999 | 346739 |
| Oil Age | mls | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | Not Changd | Not Changd | 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 | 2 | 5 | 6 |
| Chromium | ppm | ASTM D5185m | >20 | 0 | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | 0 | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | <1 | 3 | 5 |
| Lead | ppm | ASTM D5185m | >40 | 0 | 0 | <1 |
| Copper | ppm | ASTM D5185m | >330 | 0 | <1 | 1 |
| Tin | ppm | ASTM D5185m | >15 | 0 | <1 | 2 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| ADDITIVES Boron | ppm | | limit/base | current 0 | history1 0 | history2 0 |
| | ppm ppm | ASTM D5185m | | | | - |
| Boron | | ASTM D5185m | 0 | 0 | 0 | 0 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | 0 | 0 0 | 0 | 0 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 | 0 0 61 | 0 0 59 | 0 0 57 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 0 0 60 0 | 0 0 61 0 | 0 0 59 0 | 0 0 57 <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 | 0 0 61 0 1025 | 0 0 59 0 944 | 0 0 57 <1 962 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | 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 | 0 0 61 0 1025 1179 | 0 0 59 0 944 1000 1007 1199 | 0 0 57 <1 962 1061 950 1230 |
| 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 | 0 0 60 0 1010 1070 1150 | 0 0 61 0 1025 1179 1118 | 0 0 59 0 944 1000 1007 | 0 0 57 <1 962 1061 950 |
| 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 | 0 0 61 0 1025 1179 1118 1379 | 0 0 59 0 944 1000 1007 1199 | 0 0 57 <1 962 1061 950 1230 |
| 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 0 1010 1070 1150 1270 2060 | 0 0 61 0 1025 1179 1118 1379 3879 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium | 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 ASTM D5185m | 0 0 60 0 1010 1070 1150 1270 2060 limit/base | 0 0 61 00 1025 1179 1118 1379 3879 current 2 < | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 |
| 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 limit/base >25 >20 | 0 0 61 00 1025 1179 1118 1379 3879 current 2 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 |
| 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 2060 225 >20 20 | 0 0 61 0 1025 1179 1118 1379 3879 current 2 <1 0 0 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 history1 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 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 ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base | 0 0 61 0 1025 1179 1118 1379 3879 current 2 <1 0 current 0.3 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 history1 0.3 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 history2 0.4 |
| 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 2060 225 220 220 220 20 20 20 20 20 20 20 20 20 | 0 0 61 0 1025 1179 1118 1379 3879 current 2 <1 0 current 0.3 6.7 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 history1 0.3 7.3 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 history2 0.4 9.4 |
| 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 ppm | ASTM D5185m ASTM D5185m | 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base | 0 0 61 0 1025 1179 1118 1379 3879 current 2 <1 0 current 0.3 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 history1 0.3 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 history2 0.4 |
| 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 2060 225 220 220 220 20 20 20 20 20 20 20 20 20 | 0 0 61 0 1025 1179 1118 1379 3879 current 2 <1 0 current 0.3 6.7 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 history1 0.3 7.3 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 history2 0.4 9.4 |
| 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 20 225 20 imit/base >20 imit/base >20 | 0 0 61 0 1025 1179 1118 1379 3879 current 2 <1 0 current 0.3 6.7 18.1 | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 history1 0.3 7.3 17.8 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 history2 0.4 9.4 9.4 19.1 |
| 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 TS ppm ppm ppm ppm | ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844 | 0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 220 220 220 220 230 20 20 20 20 20 20 20 20 20 20 20 20 20 | 0 0 61 0 1025 1179 1118 1379 3879 current 2 <1 0 current 0.3 6.7 18.1 current | 0 0 59 0 944 1000 1007 1199 2826 history1 4 3 0 history1 0.3 7.3 17.8 history1 | 0 0 57 <1 962 1061 950 1230 3348 history2 4 3 1 history2 0.4 9.4 19.1 history2 |



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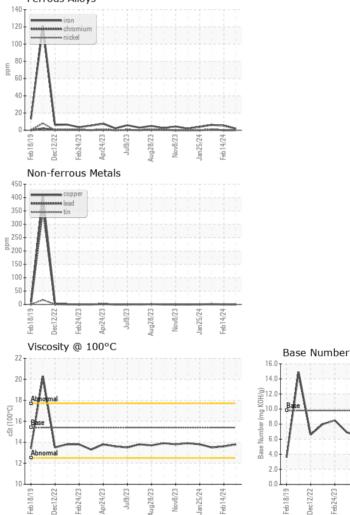


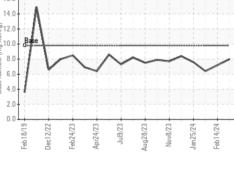


| VICONE | | mounou | | ounonit | motory | motory |
|------------------|--------|-----------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | 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 |
| 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 | 13.8 | 13.6 | 13.5 |
| GRAPHS | | | | | | |
| | | | | | | |

Ferrous Alloys

VISUAL





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 820 - Joplin Hauling Sample No. : GFL0104824 Received : 24 Apr 2024 3700 West 7th Street Lab Number : 06158730 Tested : 25 Apr 2024 Joplin, MO US 64801 Unique Number : 10994153 Diagnosed : 25 Apr 2024 - Wes Davis Test Package : FLEET Contact: James Jarrett Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. jjarrett@gflenv.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (417)310-2802 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Report Id: GFL820 [WUSCAR] 06158730 (Generated: 04/25/2024 11:40:48) Rev: 1

Contact/Location: James Jarrett - GFL820 Page 2 of 2