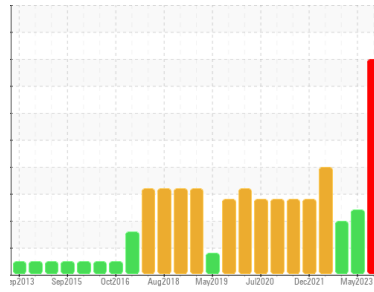




OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id
8974
 Component
Diesel Engine
 Fluid
PETRO CANADA DURON SHP 15W40 (20 LTR)

DIAGNOSIS

Recommendation

Check for low coolant level. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition. No other corrective action is recommended at this time.

Wear

Iron ppm levels are severe. Cylinder, crank, or cam shaft wear is indicated.

Contamination

Light fuel dilution occurring. Water treatment chemicals present, indicating slow coolant leak. Test for glycol is negative. No other contaminants were detected in the oil.

Fluid Condition

The oil is no longer serviceable as a result of the abnormal and/or severe wear. The condition of the oil is acceptable for the time in service (see recommendation).

SAMPLE INFORMATION

| method | limit/base | current | history1 | history2 |
|---------------|-------------|--------------------|-------------|-------------|
| Sample Number | Client Info | GFL0120079 | GFL0082361 | GFL0064623 |
| Sample Date | Client Info | 15 May 2024 | 10 May 2023 | 18 Nov 2022 |
| Machine Age | hrs | 346438 | 169204 | 161968 |
| Oil Age | hrs | 0 | 0 | 0 |
| Oil Changed | Client Info | Changed | Changed | Changed |
| Sample Status | | SEVERE | SEVERE | ATTENTION |

CONTAMINATION

| method | limit/base | current | history1 | history2 |
|--------|----------------|------------|----------|----------|
| Water | WC Method >0.2 | NEG | NEG | NEG |

WEAR METALS

| method | limit/base | current | history1 | history2 |
|-----------|------------------------|--------------|----------|----------|
| PQ | ASTM D8184* | 10 | --- | --- |
| Iron | ppm ASTM D5185(m) >90 | ▲ 269 | 7 | 21 |
| Chromium | ppm ASTM D5185(m) >20 | 6 | <1 | <1 |
| Nickel | ppm ASTM D5185(m) >2 | 2 | 0 | 0 |
| Titanium | ppm ASTM D5185(m) >2 | <1 | 0 | 0 |
| Silver | ppm ASTM D5185(m) >2 | 0 | 0 | 0 |
| Aluminum | ppm ASTM D5185(m) >20 | 16 | <1 | 1 |
| Lead | ppm ASTM D5185(m) >40 | 1 | <1 | 1 |
| Copper | ppm ASTM D5185(m) >330 | 2 | <1 | <1 |
| Tin | ppm ASTM D5185(m) >15 | 0 | 0 | <1 |
| Antimony | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Vanadium | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Beryllium | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Cadmium | ppm ASTM D5185(m) | 0 | 0 | 0 |

ADDITIVES

| method | limit/base | current | history1 | history2 |
|------------|------------------------|--------------|----------|----------|
| Boron | ppm ASTM D5185(m) 0 | 3 | 2 | 5 |
| Barium | ppm ASTM D5185(m) 0 | 0 | 0 | 0 |
| Molybdenum | ppm ASTM D5185(m) 60 | 60 | 48 | 61 |
| Manganese | ppm ASTM D5185(m) 0 | 1 | <1 | <1 |
| Magnesium | ppm ASTM D5185(m) 1010 | 927 | 764 | 956 |
| Calcium | ppm ASTM D5185(m) 1070 | 1004 | 858 | 1079 |
| Phosphorus | ppm ASTM D5185(m) 1150 | 944 | 882 | 1082 |
| Zinc | ppm ASTM D5185(m) 1270 | 1146 | 942 | 1178 |
| Sulfur | ppm ASTM D5185(m) 2060 | 2322 | 2158 | 2582 |
| Lithium | ppm ASTM D5185(m) | <1 | <1 | <1 |

CONTAMINANTS

| method | limit/base | current | history1 | history2 |
|-----------|-----------------------|--------------|----------|----------|
| Silicon | ppm ASTM D5185(m) >25 | 10 | 2 | 4 |
| Sodium | ppm ASTM D5185(m) | ● 326 | 9 | ● 249 |
| Potassium | ppm ASTM D5185(m) >20 | 13 | 0 | 6 |
| Fuel | % ASTM D7593* >3.0 | ▲ 2.5 | ▲ 17.2 | ▲ 1 |
| Glycol | % ASTM D7922* | 0.0 | NEG | 0.0 |

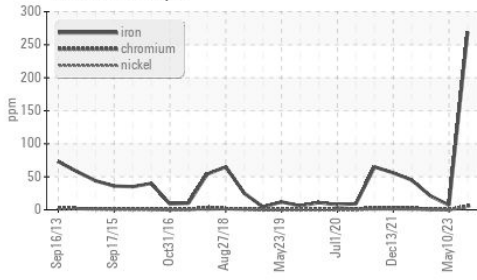
INFRA-RED

| method | limit/base | current | history1 | history2 |
|-----------|--------------------------|-------------|----------|----------|
| Soot % | % ASTM D7844* >6 | 0.5 | 0 | 2.4 |
| Nitration | Abs/cm ASTM D7624* >20 | 12.9 | 7.9 | 12.3 |
| Sulfation | Abs.:1mm ASTM D7415* >30 | 24.7 | 19.4 | 27.4 |

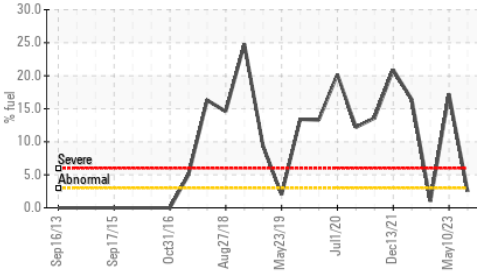


OIL ANALYSIS REPORT

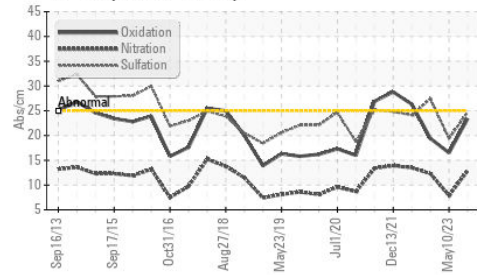
▲ Ferrous Alloys



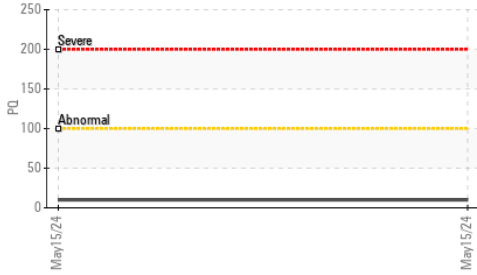
▲ Fuel Dilution



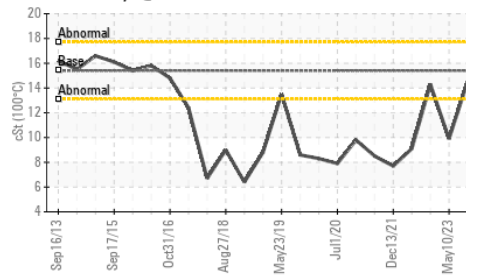
FT-IR (Direct Trend)



PQ



Viscosity @ 100°C



FLUID DEGRADATION

| method | limit/base | current | history1 | history2 | |
|-----------|----------------------|---------|----------|----------|------|
| Oxidation | Abs./1mm ASTM D7414* | >25 | 23.4 | 16.5 | 19.4 |

VISUAL

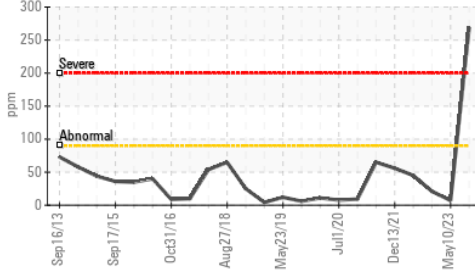
| method | limit/base | current | history1 | history2 | |
|------------------|----------------|---------|----------|----------|-----|
| Emulsified Water | scalar Visual* | >0.2 | NEG | NEG | NEG |
| Free Water | scalar Visual* | | NEG | NEG | NEG |

FLUID PROPERTIES

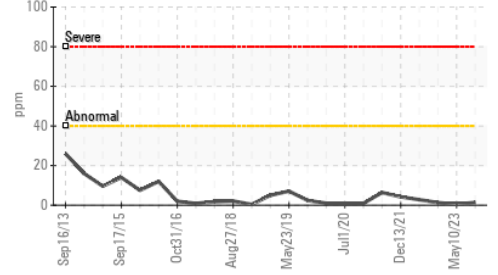
| method | limit/base | current | history1 | history2 | |
|--------------|-------------------|---------|----------|----------|------|
| Visc @ 100°C | cSt ASTM D7279(m) | 15.4 | 14.5 | ▲ 9.9 | 14.3 |

GRAPHS

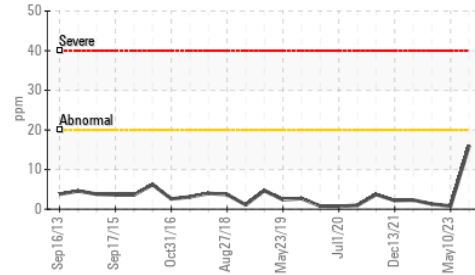
▲ Iron (ppm)



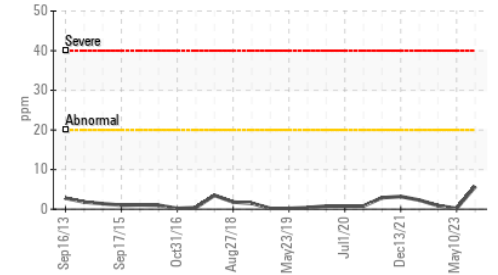
Lead (ppm)



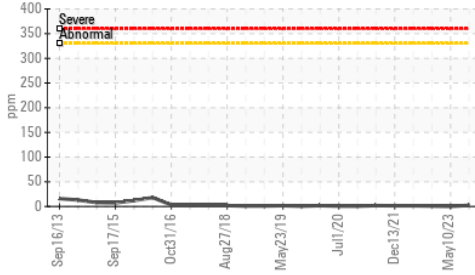
Aluminum (ppm)



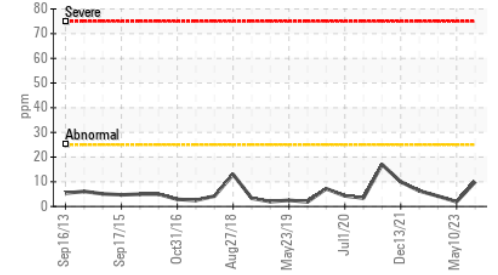
Chromium (ppm)



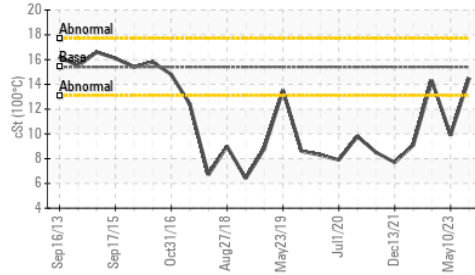
Copper (ppm)



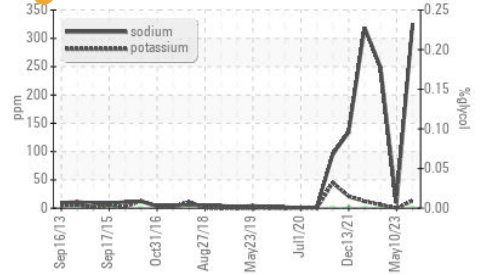
Silicon (ppm)



Viscosity @ 100°C



● Glycol Contamination



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : GFL0120079
Lab Number : 02636265
Unique Number : 5785427
Test Package : MOB 1 (Additional Tests: Glycol, PercentFuel, P Q)

GFL Environmental - 225 - COT(D2)
 20 Brydon Drive
 Etobicoke, ON
 CA M9W 5R6
 Contact: Rick Philip
 rphilip@gflenv.com
 T: (416)745-8080
 F:

To discuss this sample report, contact Customer Service at 1-800-268-2131.
 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
 Validity of results and interpretation are based on the sample and information as supplied.