



Machine Id
929090-205313
Component
Diesel Engine
Fluid
PETRO CANADA DURON SHP 15W40 (--- GAL)

RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | GFL0121442 | GFL0115808 | GFL0121432 |
| Sample Date | | Client Info | | 02 Jul 2024 | 25 Jun 2024 | 03 Jun 2024 |
| Machine Age | hrs | Client Info | | 9803 | 9793 | 9646 |
| Oil Age | hrs | Client Info | | 0 | 0 | 0 |
| Filter Age | hrs | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | Changed | Not Changd | Not Changd |
| Filter Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | SEVERE | ABNORMAL | NORMAL |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >100 | 32 | 31 | 18 |
| Chromium | ppm | ASTM D5185m | >20 | 1 | 2 | 1 |
| Nickel | ppm | ASTM D5185m | >4 | <1 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >3 | <1 | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 10 | 9 | 4 |
| Lead | ppm | ASTM D5185m | >40 | 18 | 14 | 3 |
| Copper | ppm | ASTM D5185m | >330 | 5 | 3 | <1 |
| Tin | ppm | ASTM D5185m | >15 | 1 | 1 | <1 |
| Vanadium | ppm | ASTM D5185m | | <1 | <1 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

Sodium and/or potassium levels are high. Test for glycol is positive. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. There is a high concentration of glycol present in the oil.

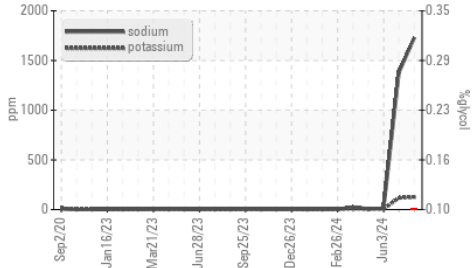
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >25 | 42 | 29 | 6 |
| Potassium | ppm | ASTM D5185m | >20 | 125 | 116 | 5 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | % | *ASTM D2982 | | 0.10 | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | 0.6 | 0.6 | 0.7 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 14.7 | 13.6 | 9.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 23.4 | 22.9 | 21.1 |
| 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 |

FLUID CONDITION

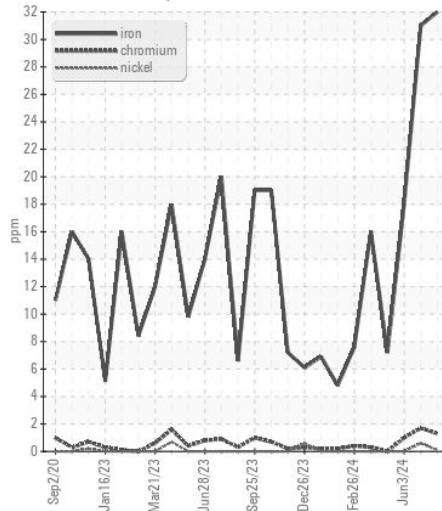
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

| | | | | | | |
|------------------|----------|-------------|------|--------------|------|------|
| Sodium | ppm | ASTM D5185m | | 1731 | 1380 | 14 |
| Boron | ppm | ASTM D5185m | 0 | 65 | 61 | 6 |
| Barium | ppm | ASTM D5185m | 0 | 0 | 2 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | 141 | 128 | 69 |
| Manganese | ppm | ASTM D5185m | 0 | <1 | 1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | 880 | 940 | 915 |
| Calcium | ppm | ASTM D5185m | 1070 | 1080 | 1116 | 1100 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 1164 | 1082 | 881 |
| Zinc | ppm | ASTM D5185m | 1270 | 1252 | 1287 | 1174 |
| Sulfur | ppm | ASTM D5185m | 2060 | 3009 | 3205 | 2784 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 16.1 | 16.1 | 16.1 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | 12.3 | 12.5 | 7.9 |
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | 13.9 | 14.0 | 13.5 |

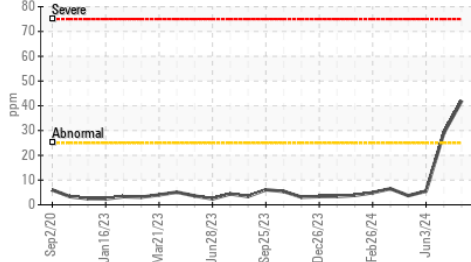
▲ Glycol Contamination



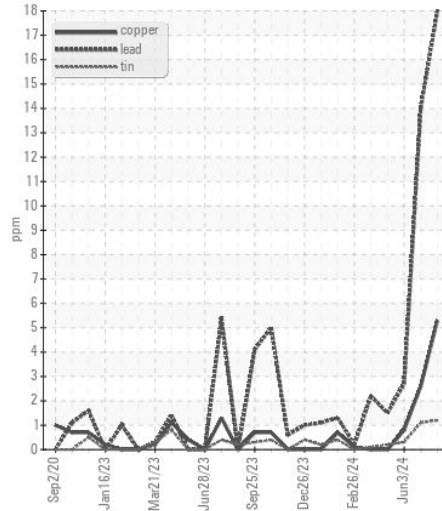
Ferrous Alloys



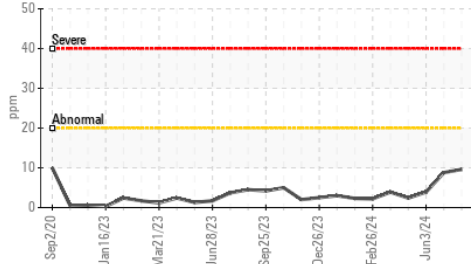
▲ Silicon (ppm)



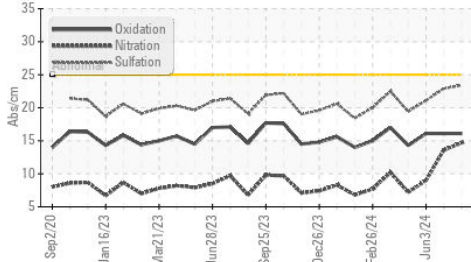
Non-ferrous Metals



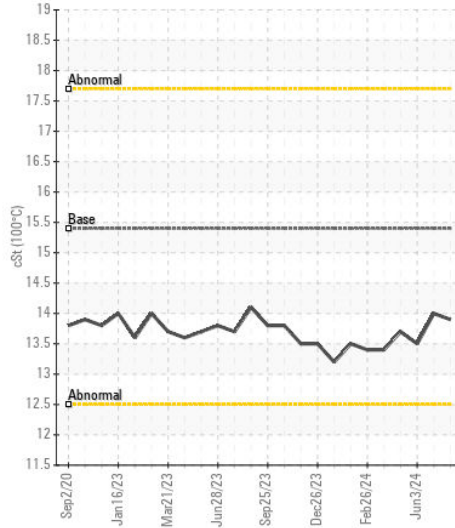
● Aluminum (ppm)



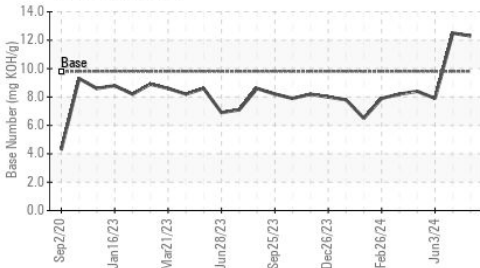
FT-IR (Direct Trend)



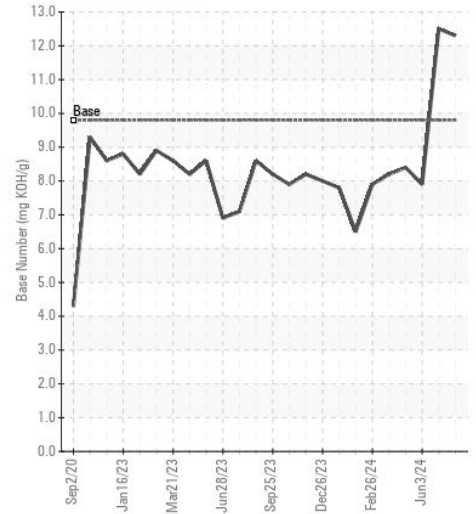
Viscosity @ 100°C



Base Number



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : GFL0121442 **Received** : 08 Jul 2024
Lab Number : 06229986 **Tested** : 09 Jul 2024
Unique Number : 11113479 **Diagnosed** : 09 Jul 2024 - Don Baldrige
Test Package : FLEET (Additional Tests: Glycol)

GFL Environmental - 868 - Childersburg Fines Hauling (Alpine)
 13737 Plant Rd
 Childersburg, AL
 US 35044
 Contact: JONATHAN WILLIAMS
 jonathan.williams@gflenv.com

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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F: