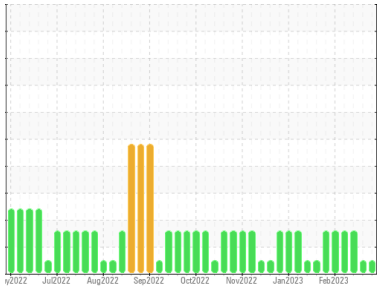
# OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Machine Id
## GZJ00403
Component
**Biogas Engine**
Fluid
**PETRO CANADA SENTRON CG 40 (--- 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 AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0699019** | WC0699025 | WC0699081 |
| Sample Date | | Client Info | | **13 Mar 2023** | 07 Mar 2023 | 27 Feb 2023 |
| Machine Age | hrs | Client Info | | **112879** | 112735 | 112546 |
| Oil Age | hrs | Client Info | | **261** | 117 | 904 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **NORMAL** | NORMAL | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Water | | WC Method | >0.1 | **NEG** | NEG | NEG |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >45 | **3** | 2 | 11 |
| Chromium | ppm | ASTM D5185m | >2 | **<1** | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >5 | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | >10 | **2** | <1 | 3 |
| Lead | ppm | ASTM D5185m | >5 | **<1** | 0 | 3 |
| Copper | ppm | ASTM D5185m | >14 | **<1** | <1 | 3 |
| Tin | ppm | ASTM D5185m | >13 | **2** | <1 | 6 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **1** | <1 | 0 |
| Barium | ppm | ASTM D5185m | 1 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 2 | **1** | <1 | 2 |
| Manganese | ppm | ASTM D5185m | 1 | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 9 | **14** | 14 | 13 |
| Calcium | ppm | ASTM D5185m | 2712 | **2734** | 2571 | 2886 |
| Phosphorus | ppm | ASTM D5185m | 292 | **263** | 251 | 274 |
| Zinc | ppm | ASTM D5185m | 342 | **322** | 305 | 353 |
| Sulfur | ppm | ASTM D5185m | 2575 | **3772** | 3153 | 3876 |

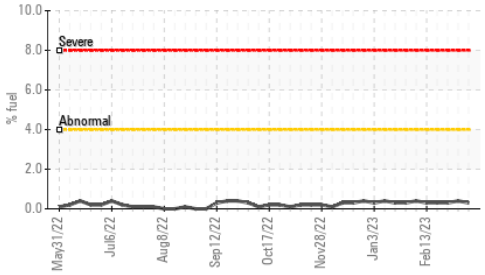
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >200 | **148** | 83 | ▲ 401 |
| Sodium | ppm | ASTM D5185m | | **0** | 0 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | **<1** | 0 | 0 |
| Fuel | % | ASTM D3524 | >4.0 | **0.3** | 0.4 | 0.3 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | | **0.1** | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **4.6** | 5.8 | 5.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **16.8** | 19.1 | 20.8 |

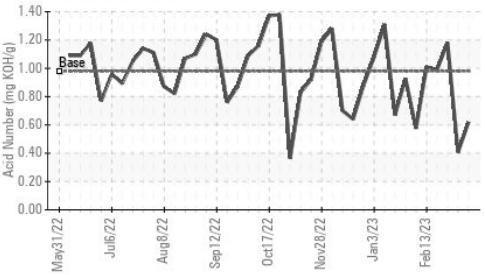
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **8.9** | 12.2 | 11.6 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.98 | **0.62** | 0.406 | 1.18 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.1 | **7.87** | 8.07 | 7.08 |

# OIL ANALYSIS REPORT

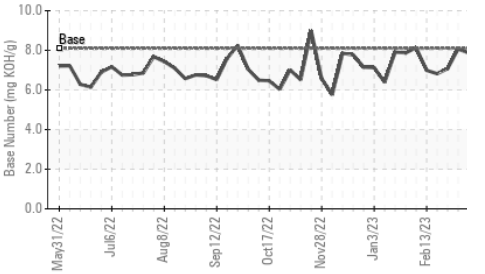
Fuel Dilution



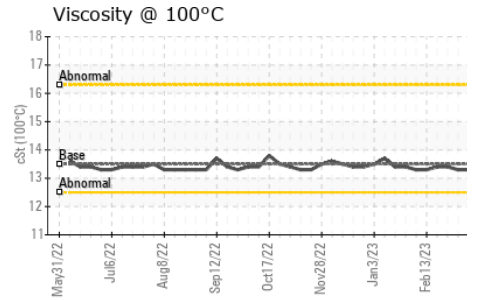

Acid Number




Base Number




Viscosity @ 100°C

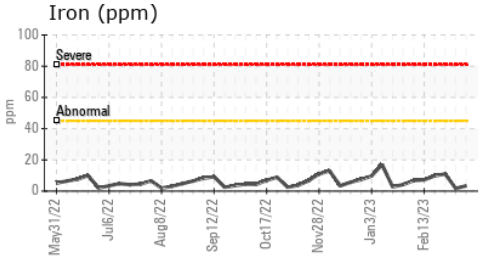



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Debris | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 | >0.1 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

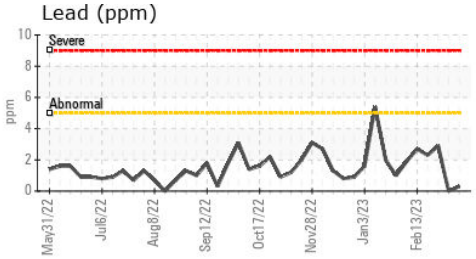
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 13.5 | **13.3** | 13.3 | 13.4 |

## GRAPHS

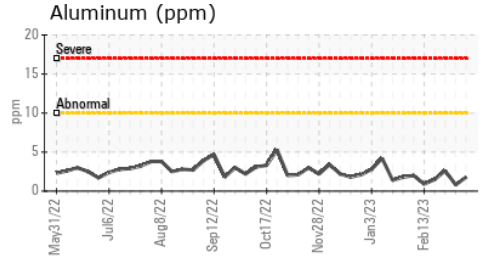
Iron (ppm)



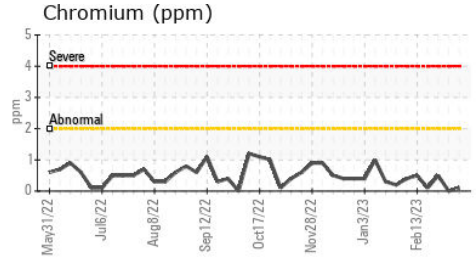

Lead (ppm)



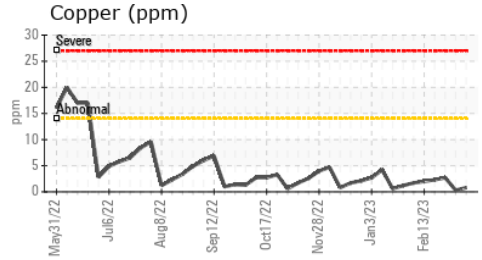

Aluminum (ppm)



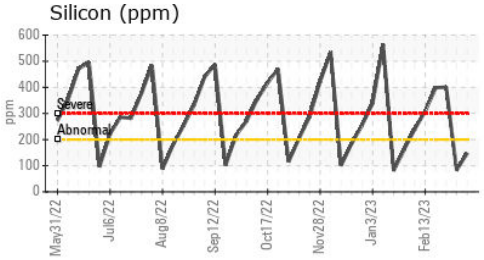

Chromium (ppm)



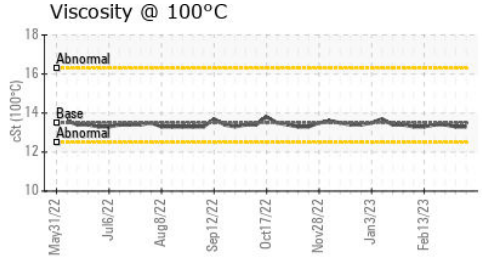

Copper (ppm)



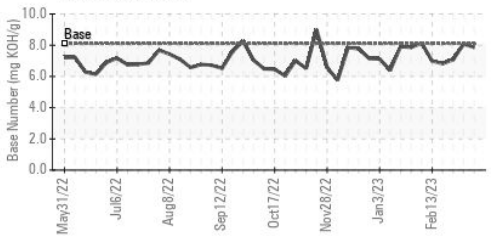

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0699019 **Received** : 15 Mar 2023
**Lab Number** : 05792983 **Tested** : 17 Mar 2023
**Unique Number** : 10377654 **Diagnosed** : 17 Mar 2023 - Sean Felton
**Test Package** : MOB 2 ( Additional Tests: FuelDilution, PercentFuel )

*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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Submitted By: Blain Middleton