

OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id GZJ00314 Component Biogas Engine Fluid RETRO CANADA

PETRO CANADA SENTRON CG 40 (145 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Total oil added 64 gal)

Wear

All component wear rates are normal.

Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

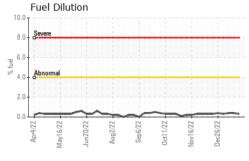
Fluid Condition

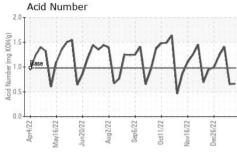
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

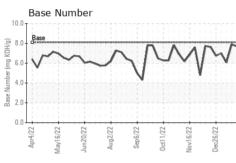
| RON CG 40 (145 | GAL) | r2022 May20 | 22 Jun2022 Aug2022 | Sep2022 Oct2022 Nov2022 | Dec2022 | |
|---|--|--|---|---|--|--|
| SAMPLE INFORM | IATION | method | limit/base | current | history1 | history2 |
| Sample Number | | Client Info | | WC0699000 | WC0699003 | WC0698998 |
| Sample Date | | Client Info | | 30 Jan 2023 | 24 Jan 2023 | 17 Jan 2023 |
| Machine Age | hrs | Client Info | | 120488 | 120344 | 120184 |
| Oil Age | hrs | Client Info | | 225 | 81 | 923 |
| Oil Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | NORMAL | NORMAL | ABNORMAL |
| CONTAMINATION | ١ | 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 |
| ron | ppm | ASTM D5185m | >45 | 2 | 2 | 12 |
| Chromium | ppm | ASTM D5185m | >2 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | <1 | <1 | <1 |
| Titanium | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >5 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >10 | 2 | 1 | 4 |
| _ead | ppm | ASTM D5185m | >5 | <1 | 1 | 2 |
| Copper | ppm | ASTM D5185m | >14 | 1 | <1 | 4 |
| Γin | ppm | ASTM D5185m | >13 | 2 | 2 | 8 |
| /anadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | 0 | 0 | 0 | <1 |
| | | | | | | |
| Barium | ppm | ASTM D5185m | 1 | 0 | 0 | 0 |
| | ppm ppm | ASTM D5185m ASTM D5185m | 2 | 0 <1 | 0 <1 | 0 2 |
| Molybdenum | | ASTM D5185m | | - | | |
| Molybdenum Manganese | ppm | ASTM D5185m | 2 | <1 | <1 | 2 |
| Molybdenum Manganese Magnesium | ppm | ASTM D5185m ASTM D5185m | 2 | <1 <1 | <1 <1 | 2 <1 |
| Molybdenum Manganese Magnesium Calcium | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 2 1 9 | <1 <1 12 | <1 <1 14 | 2 <1 18 |
| Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 2 1 9 2712 | <1 <1 12 2816 | <1 <1 14 3034 | 2 <1 18 3514 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 2 1 9 2712 292 | <1 <1 12 2816 273 | <1 <1 14 3034 310 | 2 <1 18 3514 362 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 2 1 9 2712 292 342 | <1 <1 12 2816 273 342 | <1 <1 14 3034 310 371 | 2 <1 18 3514 362 432 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 2 1 9 2712 292 342 2575 | <1 <1 12 2816 273 342 3313 | <1 <1 14 3034 310 371 3953 | 2 <1 18 3514 362 432 4782 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 2 1 9 2712 292 342 2575 limit/base | <1 <1 12 2816 273 342 3313 | <1 <1 14 3034 310 371 3953 history1 | 2 <1 18 3514 362 432 4782 history2 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm | ASTM D5185m | 2 1 9 2712 292 342 2575 limit/base | <1 <1 12 2816 273 342 3313 current 169 | <1 <1 14 3034 310 371 3953 history1 | 2 <1 18 3514 362 432 4782 history2 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | 2 1 9 2712 292 342 2575 limit/base >200 | <1 <1 12 2816 273 342 3313 current 169 0 | <1 <1 14 3034 310 371 3953 history1 83 <1 | 2 <1 18 3514 362 432 4782 history2 450 4 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | 2 1 9 2712 292 342 2575 limit/base >200 | <1 <1 12 2816 273 342 3313 current 169 0 1 | <1 <1 14 3034 310 371 3953 history1 83 <1 <1 | 2 <1 18 3514 362 432 4782 history2 450 4 <1 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Gulfur CONTAMINANTS Silicon Sodium Potassium Fuel | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | 2 1 9 2712 292 342 2575 limit/base >200 >4.0 | <1 <1 12 2816 273 342 3313 current 169 0 1 0.3 | <1 <1 <1 14 3034 310 371 3953 history1 83 <1 <1 <1 0.4 | 2 <1 18 3514 362 432 4782 history2 450 4 <1 0.4 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D3524 | 2 1 9 2712 292 342 2575 limit/base >200 >4.0 | <1 <1 12 2816 273 342 3313 current 169 0 1 0.3 current | <1 <1 <1 14 3034 310 371 3953 history1 83 <1 <1 0.4 history1 | 2 <1 18 3514 362 432 4782 history2 450 4 <1 0.4 history2 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D3524 method *ASTM D7844 | 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base | <1 <1 12 2816 273 342 3313 current 169 0 1 0.3 current 0.1 | <1 <1 <1 14 3034 310 371 3953 history1 83 <1 <1 0.4 history1 0 | 2 <1 18 3514 362 432 4782 history2 450 4 <1 0.4 history2 0.1 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D7824 | 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base | <1 <1 <1 12 2816 273 342 3313 current 169 0 1 0.3 current 0.1 5.1 | <1 <1 <1 14 3034 310 371 3953 history1 83 <1 <1 <1 0.4 history1 0 4.4 | 2 <1 18 3514 362 432 4782 history2 450 4 <1 0.4 history2 0.1 6.5 |
| Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D76145 | 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30 | <1 <1 <1 12 2816 273 342 3313 current 169 0 1 0.3 current 0.1 5.1 17.3 | <1 <1 <1 14 3034 310 371 3953 history1 83 <1 <1 0.4 history1 0 4.4 15.3 | 2 <1 18 3514 362 432 4782 history2 ▲ 450 4 <1 0.4 history2 0.1 6.5 22.8 |
| Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D78124 *ASTM D7844 *ASTM D7624 *ASTM D7415 method | 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30 limit/base | <1 <1 <1 12 2816 273 342 3313 current 169 0 1 0.3 current 5.1 17.3 current | <1 <1 <1 14 3034 310 371 3953 history1 83 <1 <1 <1 0.4 history1 0 4.4 15.3 history1 | 2 <1 18 3514 362 432 4782 history2 450 4 <1 0.4 history2 0.1 6.5 22.8 history2 |

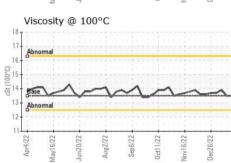


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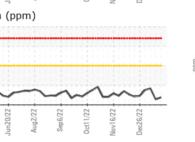


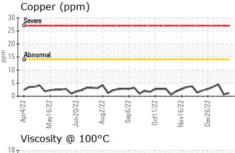


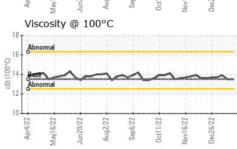
| VISUAL | | method | | | | history2 |
|-------------------------|--------|---------|-------|-------|-------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | NONE | NONE | NONE |
| Sand/Dirt | scalar | *Visual | NONE | NONE | NONE | NONE |
| 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 |

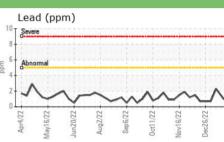
| FLUID PROPER | RTIES | method limit/bas | | | | history2 |
|--------------|-------|------------------|------|------|------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 13.5 | 13.5 | 13.5 | 13.9 |

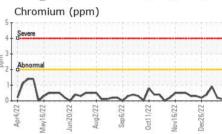
| 80 Sev | ere | | | | | | | |
|---------|---------|---------|---------|---------|---------|----------|----------|---|
| 60 | ormal | | | | | | | |
| 20 | | | | | | | | |
| 0 | 7 | 7 | ~ | 2 | 2 | | <u></u> | _ |
| Apr4/22 | May16/2 | Jun20/2 | Aug2/22 | Sep6/22 | Oct11/2 | Nov16/22 | Dec26/2; | |
| Δlı | ıminu | m (pr | m) | | | _ | | |

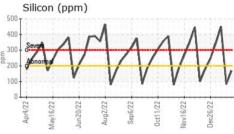


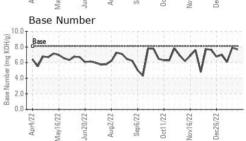
















Laboratory Sample No. Unique Number : 10324752

Lab Number : 05760145

: WC0699000

Received **Tested**

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 06 Feb 2023 : 08 Feb 2023

: 08 Feb 2023 - Jonathan Hester

Diagnosed Test Package : MOB 2 (Additional Tests: FuelDilution, PercentFuel)

US 97818 Contact: Blain Middleton bmiddleton@archaea.energy T: (541)481-3232

FINLEY BIOENERGY

Boardman, OR

74265 Bombing Range Road

Certificate L2367

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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