

OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id GZJ00314 Component Biogas Engine Fluid PETRO CANADA

PETRO CANADA SENTRON CG 40 (145 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Total oil added 32 gal)

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

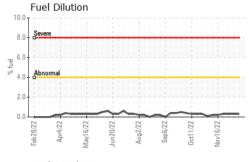
Fluid Condition

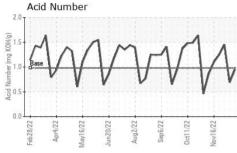
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

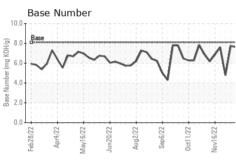
| Sample Number Client Info WC0699013 WC0698992 WC0698990 Sample Date Client Info 19 Dec 2022 12 Dec 2022 05 Dec 2022 Machine Age hrs Client Info 262 101 928 119189 Oil Age hrs Client Info 262 101 928 Oil Changed Client Info N/A | RON CG 40 (145 | GAL) | 32022 Apr20 | 22 May2022 Jun2022 | Aug2022 Sep2022 Oct2022 | Wov2022 | |
|--|------------------|----------|-------------|--------------------|-------------------------|-------------|-------------|
| Sample Date Client Info 19 Dec 2022 12 Dec 2022 05 Dec 2022 Machine Age hrs Client Info 119523 119362 119189 | SAMPLE INFORM | MATION | method | limit/base | current | history1 | history2 |
| Machine Age | Sample Number | | Client Info | | WC0699013 | WC0698992 | WC0698990 |
| Dil Age | Sample Date | | Client Info | | 19 Dec 2022 | 12 Dec 2022 | 05 Dec 2022 |
| Dil Changed Client Info N/A N/A N/A N/A NORMAL ABNORMAL ABN | Machine Age | hrs | Client Info | | 119523 | 119362 | 119189 |
| NORMAL NORMAL NORMAL ABNORMAL | Oil Age | hrs | Client Info | | 262 | 101 | 928 |
| 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 history1 Iron ppm ASTM D5185m >45 4 3 10 Chromium ppm ASTM D5185m >22 <1 | Oil Changed | | Client Info | | N/A | N/A | N/A |
| Water WC Method >0.1 NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 fron ppm ASTM D5185m >45 4 3 10 Chromium ppm ASTM D5185m >22 <1 <1 <1 Nickel ppm ASTM D5185m >22 0 <1 <1 <0 Silver ppm ASTM D5185m >5 0 0 0 0 Silver ppm ASTM D5185m >10 2 3 4 4 Silver ppm ASTM D5185m >10 2 3 4 4 Copper ppm ASTM D5185m >10 2 3 4 2 1 4 Circin ppm ASTM D5185m >13 3 2 2 8 Circin ppm | Sample Status | | | | NORMAL | NORMAL | ABNORMAL |
| WEAR METALS | CONTAMINATION | N | method | limit/base | current | history1 | history2 |
| WEAR METALS | Water | | WC Method | >0.1 | NEG | NEG | NEG |
| ASTM D5185m S45 A | Glycol | | WC Method | | NEG | NEG | NEG |
| Chromium ppm ASTM D5185m >2 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 <1 | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Nickel ppm ASTM D5185m >2 | ron | ppm | ASTM D5185m | >45 | 4 | 3 | 10 |
| Silver | Chromium | ppm | ASTM D5185m | >2 | <1 | <1 | <1 |
| Silver | Nickel | ppm | ASTM D5185m | >2 | 0 | <1 | 0 |
| Silver | Titanium | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Lead ppm ASTM D5185m >5 <1 2 1 Copper ppm ASTM D5185m >14 2 1 4 Tin ppm ASTM D5185m >13 3 2 8 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 1 1 1 Barium ppm ASTM D5185m 0 1 1 1 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 1 0 0 0 Magnesium ppm ASTM D5185m 2 <1 1 1 Calcium ppm ASTM D5185m 9 13 17 14 Calcium ppm ASTM D5185m 292 269 293 309 Zinc ppm ASTM D5185m 292 269 293 309 | Silver | ppm | ASTM D5185m | >5 | 0 | 0 | 0 |
| Copper ppm ASTM D5185m >14 2 1 4 Fin ppm ASTM D5185m >13 3 2 8 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 1 1 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 <1 | Aluminum | ppm | ASTM D5185m | >10 | 2 | 3 | 4 |
| Tin | Lead | ppm | ASTM D5185m | >5 | <1 | 2 | 1 |
| AFIN Part | Copper | ppm | ASTM D5185m | >14 | 2 | 1 | 4 |
| Vanadium 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 1 1 1 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 1 <1 1 1 Manganese ppm ASTM D5185m 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 < | Γin | ppm | ASTM D5185m | >13 | 3 | 2 | 8 |
| Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 1 1 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 <1 | Vanadium | | ASTM D5185m | | 0 | 0 | 0 |
| Boron | Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Barium ppm ASTM D5185m 1 0 0 0 0 Molybdenum ppm ASTM D5185m 2 < -1 1 1 1 Manganese ppm ASTM D5185m 1 <-1 <-1 <-1 <-1 Magnesium ppm ASTM D5185m 9 13 17 14 Calcium ppm ASTM D5185m 2712 2851 2826 3337 Phosphorus ppm ASTM D5185m 292 269 293 309 Zinc ppm ASTM D5185m 342 344 337 406 Sulfur ppm ASTM D5185m 2575 4152 3494 4199 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 181 100 ▲ 446 Sodium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D5185m >20 1 0 0 1 Fuel % ASTM D5185m >20 1 0 0 1 Fuel % ASTM D5185m >20 1 0 0 1 Fuel % ASTM D5185m >20 1 0 0 1 Fuel % ASTM D5185m >20 1 0 0 1 Fuel % ASTM D5185m >20 1 0 0 1 Fuel % ASTM D5185m >20 1 0 0 1 Fuel % ASTM D7844 0.1 0.1 0.1 0.1 Fuel % ASTM D7844 0.1 0.1 0.1 0.1 0.1 Fuel % ASTM D7844 0.1 0.1 0.1 0.1 0.1 Fuel % ASTM D7844 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 2 <1 1 1 Manganese ppm ASTM D5185m 1 <1 | Boron | ppm | ASTM D5185m | 0 | 1 | 1 | 1 |
| Manganese ppm ASTM D5185m 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1</td> <th>0</th> <td>0</td> <td>0</td> | Barium | ppm | ASTM D5185m | 1 | 0 | 0 | 0 |
| Magnesium ppm ASTM D5185m 9 13 17 14 Calcium ppm ASTM D5185m 2712 2851 2826 3337 Phosphorus ppm ASTM D5185m 292 269 293 309 Zinc ppm ASTM D5185m 342 344 337 406 Sulfur ppm ASTM D5185m 2575 4152 3494 4199 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 181 100 446 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D3524 >4.0 0.3 0.3 0.3 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624 >20 5.7< | Molybdenum | ppm | ASTM D5185m | 2 | <1 | 1 | 1 |
| Calcium ppm ASTM D5185m 2712 2851 2826 3337 Phosphorus ppm ASTM D5185m 292 269 293 309 Zinc ppm ASTM D5185m 342 344 337 406 Sulfur ppm ASTM D5185m 2575 4152 3494 4199 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 181 100 ▲ 446 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D3524 >4.0 0.3 0.3 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/:nm *ASTM D78 | Manganese | ppm | ASTM D5185m | 1 | <1 | <1 | <1 |
| Phosphorus ppm ASTM D5185m 292 269 293 309 Zinc ppm ASTM D5185m 342 344 337 406 Sulfur ppm ASTM D5185m 2575 4152 3494 4199 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 181 100 ▲ 446 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D3524 >4.0 0.3 0.3 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/.mm *ASTM D7415 >30 19.9 17.5 24.6 FLUID DEGRADATION method limit/base | Magnesium | ppm | ASTM D5185m | 9 | 13 | 17 | 14 |
| Zinc ppm ASTM D5185m 342 344 337 406 Sulfur ppm ASTM D5185m 2575 4152 3494 4199 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 181 100 446 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D5185m >20 1 0 1 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Soot % % *ASTM D7624 >20 5.7 5.0 <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>2712</td> <th>2851</th> <td>2826</td> <td>3337</td> | Calcium | ppm | ASTM D5185m | 2712 | 2851 | 2826 | 3337 |
| Sulfur ppm ASTM D5185m 2575 4152 3494 4199 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 181 100 ▲ 446 Sodium ppm ASTM D5185m 0 <1 <1 Potassium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D5185m >20 1 0 1 Soot % % ASTM D5185m >20 1 0 1 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Soot % % *ASTM D7624 >20 5.7 5.0 6.9 | Phosphorus | ppm | ASTM D5185m | 292 | 269 | 293 | 309 |
| CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 181 100 ▲ 446 Sodium ppm ASTM D5185m 0 <1 | Zinc | ppm | ASTM D5185m | 342 | 344 | 337 | 406 |
| Silicon ppm ASTM D5185m >200 181 100 ▲ 446 Sodium ppm ASTM D5185m 0 <1 <1 Potassium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D3524 >4.0 0.3 0.3 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 5.0 6.9 Sulfation Abs/.1mm *ASTM D7415 >30 19.9 17.5 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | Sulfur | ppm | ASTM D5185m | 2575 | 4152 | 3494 | 4199 |
| Sodium | CONTAMINANTS | | method | limit/base | current | history1 | history2 |
| Potassium ppm ASTM D5185m >20 1 0 1 Fuel % ASTM D3524 >4.0 0.3 0.3 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 5.0 6.9 Sulfation Abs/.1mm *ASTM D7415 >30 19.9 17.5 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | Silicon | ppm | ASTM D5185m | >200 | 181 | 100 | 446 |
| Fuel % ASTM D3524 >4.0 0.3 0.3 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 5.7 5.0 6.9 Sulfation Abs/.1mm *ASTM D7415 >30 19.9 17.5 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | Sodium | ppm | ASTM D5185m | | 0 | <1 | <1 |
| INFRA-RED | Potassium | ppm | ASTM D5185m | >20 | 1 | 0 | 1 |
| Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 5.0 6.9 Sulfation Abs/.1mm *ASTM D7415 >30 19.9 17.5 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | Fuel | % | ASTM D3524 | >4.0 | 0.3 | 0.3 | 0.3 |
| Nitration Abs/cm *ASTM D7624 >20 5.7 5.0 6.9 Sulfation Abs/.1mm *ASTM D7615 >30 19.9 17.5 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | INFRA-RED | | method | limit/base | current | history1 | history2 |
| Sulfation Abs/.1mm *ASTM D7415 >30 19.9 17.5 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | Soot % | % | *ASTM D7844 | | 0.1 | 0.1 | 0.1 |
| FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | Nitration | Abs/cm | *ASTM D7624 | >20 | 5.7 | 5.0 | 6.9 |
| Oxidation Abs/.1mm *ASTM D7414 >25 11.5 9.7 16.3 Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 19.9 | 17.5 | 24.6 |
| Acid Number (AN) mg KOH/g ASTM D8045 0.98 0.95 0.69 1.45 | FLUID DEGRADA | TION | method | limit/base | current | history1 | history2 |
| | Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 11.5 | 9.7 | 16.3 |
| | Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.98 | 0.95 | 0.69 | 1.45 |
| | Base Number (BN) | | ASTM D2896 | 8.1 | | 7.73 | 4.78 |

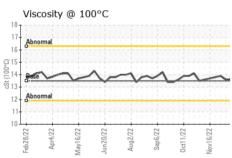


OIL ANALYSIS REPORT





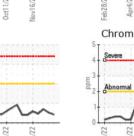


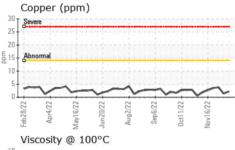


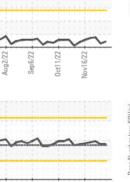
| VISUAL | | method | | | | history2 |
|-------------------------|--------|---------|-------|-------|-------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | 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 |

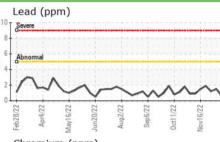
| FLUID FROFER | THES | memou | | | HISTOLAL | HISTOLA |
|--------------|------|-----------|------|------|----------|---------|
| Visc @ 100°C | cSt | ASTM D445 | 13.5 | 13.6 | 13.6 | 13.9 |

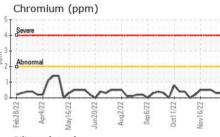
| Severe | | | | | | |
|---------------------|----------|---------------|---------------|---------|-------|----------|
| 80 | | | 11111 | 11:11 | 11:11 | 11:11 |
| Abnormal | | | | | | |
| 40 | | | | | | |
| 20 | | | | | | |
| 0 | <u> </u> | $\overline{}$ | $\overline{}$ | - | _ | |
| Feb28/22 Apr4/22 | 6/22 | 0/22 | Aug2/22 | Sep6/22 | 1/22 | Nov16/22 |
| b2 | May16/2 | Jun20/ | Bny | 등 | 0ct11 | 100 |

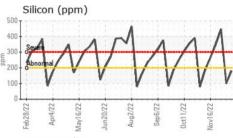


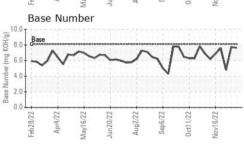
















Laboratory Sample No. Lab Number : 05723747 Unique Number: 10268328

()0014 ()0014

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0699013

Received

Tested Diagnosed

: 22 Dec 2022

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

: 21 Dec 2022

: 23 Dec 2022 - Don Baldridge To discuss this sample report, contact Customer Service at 1-800-237-1369.

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

FINLEY BIOENERGY

Boardman, OR

74265 Bombing Range Road

* - 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)

Report Id: FINLEX [WUSCAR] 05723747 (Generated: 03/06/2024 17:34:02) Rev: 1

Submitted By: Blain Middleton

F: