

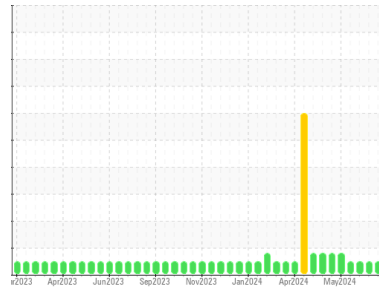


OIL ANALYSIS REPORT



Machine Id
JENBACHER GM03 (S/N 1144731)
 Component
Biogas Engine
 Fluid
MAHLER Q8 Mahler G8 SAE 40 (--- GAL)

Sample Rating Trend



NORMAL



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 | | WC0914298 | WC0721817 | WC0852950 |
| Sample Date | Client Info | | 03 Jun 2024 | 29 May 2024 | 20 May 2024 |
| Machine Age | hrs | Client Info | 51962 | 51850 | 51695 |
| Oil Age | hrs | Client Info | 363 | 251 | 96 |
| Oil Changed | Client Info | | N/A | N/A | N/A |
| Sample Status | | | NORMAL | NORMAL | NORMAL |

CONTAMINATION

| | method | limit/base | current | history1 | history2 |
|--------|-----------|------------|----------------|----------|----------|
| Fuel | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Water | WC Method | >.2 | NEG | NEG | NEG |
| Glycol | WC Method | | NEG | NEG | NEG |

WEAR METALS

| | method | limit/base | current | history1 | history2 |
|----------|--------|-----------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m >20 | 6 | 5 | 15 |
| Chromium | ppm | ASTM D5185m >5 | 0 | 0 | <1 |
| Nickel | ppm | ASTM D5185m >2 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Silver | ppm | ASTM D5185m >5 | 0 | 0 | <1 |
| Aluminum | ppm | ASTM D5185m >15 | 2 | 2 | <1 |
| Lead | ppm | ASTM D5185m >20 | 0 | 0 | <1 |
| Copper | ppm | ASTM D5185m >15 | <1 | <1 | 0 |
| Tin | ppm | ASTM D5185m >5 | <1 | 1 | 0 |
| Vanadium | ppm | ASTM D5185m | <1 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | 0 | 0 | 0 |

ADDITIVES

| | method | limit/base | current | history1 | history2 |
|------------|--------|-------------|--------------|----------|----------|
| Boron | ppm | ASTM D5185m | 0 | 0 | 1 |
| Barium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 0 | 0 | 3 |
| Manganese | ppm | ASTM D5185m | <1 | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 0 | 6 | 45 |
| Calcium | ppm | ASTM D5185m | 2449 | 2289 | 2484 |
| Phosphorus | ppm | ASTM D5185m | 415 | 425 | 926 |
| Zinc | ppm | ASTM D5185m | 451 | 457 | 998 |
| Sulfur | ppm | ASTM D5185m | 2742 | 2813 | 4014 |

CONTAMINANTS

| | method | limit/base | current | history1 | history2 |
|-----------|--------|------------------|-----------|----------|----------|
| Silicon | ppm | ASTM D5185m >200 | 13 | 10 | 4 |
| Sodium | ppm | ASTM D5185m >20 | 2 | <1 | 1 |
| Potassium | ppm | ASTM D5185m >20 | 0 | 0 | 0 |

INFRA-RED

| | method | limit/base | current | history1 | history2 |
|-----------|----------|-----------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 >2 | 0 | 0 | 0 |
| Nitration | Abs/cm | *ASTM D7624 >20 | 6.7 | 6.2 | 5.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 >30 | 15.4 | 15.2 | 14.9 |

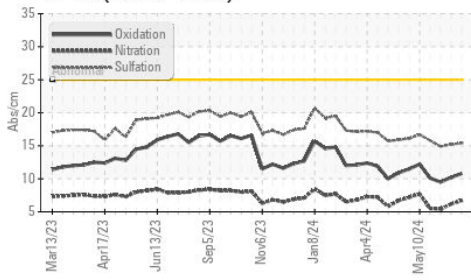
FLUID DEGRADATION

| | method | limit/base | current | history1 | history2 |
|------------------|----------|-----------------|--------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 >25 | 10.8 | 10.2 | 9.5 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 1.509 | 0.94 | 1.066 |
| Base Number (BN) | mg KOH/g | ASTM D2896 8.0 | 6.78 | 7.77 | 8.56 |

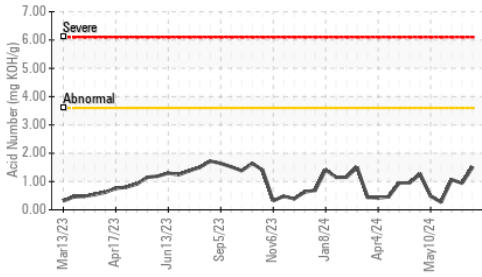


OIL ANALYSIS REPORT

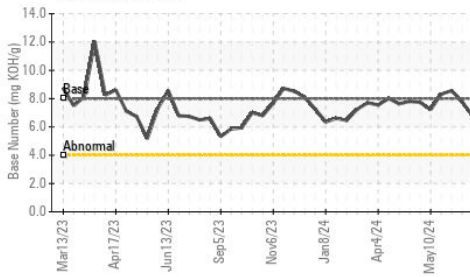
FT-IR (Direct Trend)



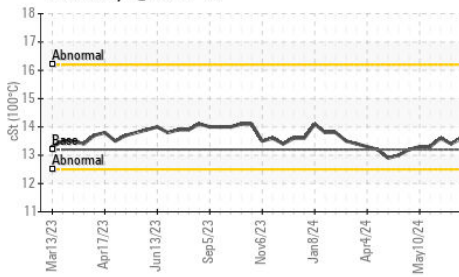
Acid Number



Base Number



Viscosity @ 100°C

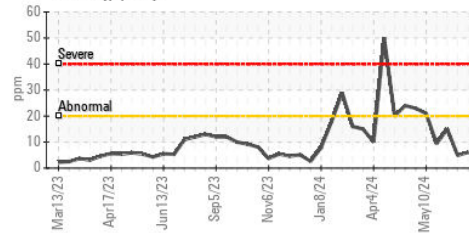


| VISUAL | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | NONE | NONE |
| Sand/Dirt | scalar | *Visual | NONE | NONE | NONE |
| Appearance | scalar | *Visual | NORML | NORML | NORML |
| Odor | scalar | *Visual | NORML | NORML | NORML |
| Emulsified Water | scalar | *Visual | >.2 | NEG | NEG |
| Free Water | scalar | *Visual | | NEG | NEG |

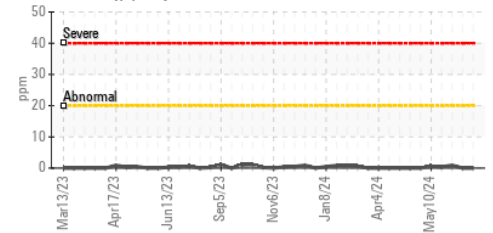
| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 13.2 | 13.6 | 13.4 |

GRAPHS

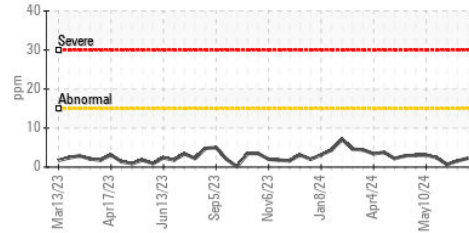
Iron (ppm)



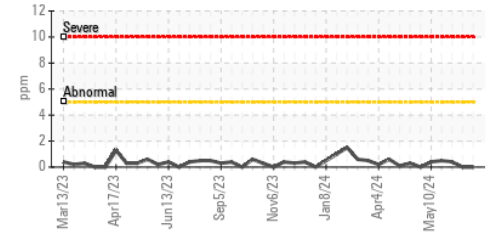
Lead (ppm)



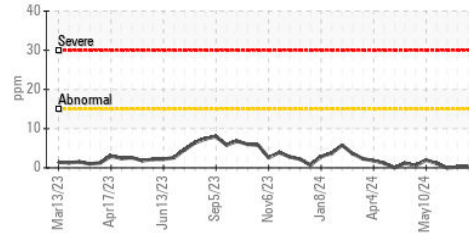
Aluminum (ppm)



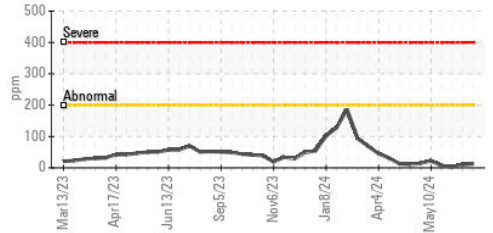
Chromium (ppm)



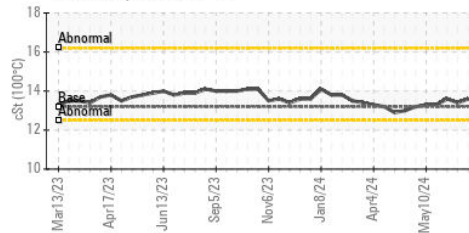
Copper (ppm)



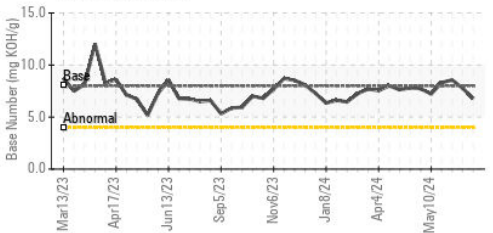
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

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

Sample No. : WC0914298

Lab Number : 06199438

Unique Number : 11061561

Test Package : MOB 2

Received : 04 Jun 2024

Tested : 05 Jun 2024

Diagnosed : 06 Jun 2024 - Sean Felton

PINE RIDGE

105 BAILEY JESTER RD

GRIFFIN, GA

US 30224

Contact: STEPHEN SAVAGE

stephen.savage@cubedistrictenergy.com

T:

F:

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)