

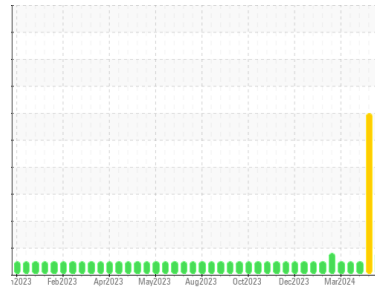


OIL ANALYSIS REPORT



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

Sample Rating Trend



DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

The iron level is abnormal. All other 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 | | WC0880435 | WC0880429 | WC0880426 |
| Sample Date | Client Info | | 19 Apr 2024 | 12 Apr 2024 | 04 Apr 2024 |
| Machine Age | hrs | Client Info | 51141 | 50992 | 50871 |
| Oil Age | hrs | Client Info | 26 | 465 | 344 |
| Oil Changed | Client Info | | N/A | N/A | N/A |
| Sample Status | | | ABNORMAL | SEVERE | 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 | ▲ 20 | ▲ 50 | 10 |
| Chromium | ppm | ASTM D5185m >5 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m >2 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Silver | ppm | ASTM D5185m >5 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m >15 | 2 | 4 | 3 |
| Lead | ppm | ASTM D5185m >20 | 0 | 0 | 0 |
| Copper | ppm | ASTM D5185m >15 | 0 | 1 | 2 |
| Tin | ppm | ASTM D5185m >5 | <1 | <1 | 1 |
| 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 | 0 | <1 |
| Barium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 0 | <1 | <1 |
| Manganese | ppm | ASTM D5185m | <1 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 8 | 4 | 9 |
| Calcium | ppm | ASTM D5185m | 2296 | 2255 | 2353 |
| Phosphorus | ppm | ASTM D5185m | 399 | 354 | 421 |
| Zinc | ppm | ASTM D5185m | 451 | 380 | 487 |
| Sulfur | ppm | ASTM D5185m | 2526 | 2235 | 2794 |

CONTAMINANTS

| | method | limit/base | current | history1 | history2 |
|-----------|--------|------------------|-----------|----------|----------|
| Silicon | ppm | ASTM D5185m >200 | 13 | 31 | 45 |
| Sodium | ppm | ASTM D5185m >20 | 1 | 2 | <1 |
| Potassium | ppm | ASTM D5185m >20 | 0 | 0 | 0 |

INFRA-RED

| | method | limit/base | current | history1 | history2 |
|-----------|----------|-----------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 >2 | 0 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 >20 | 5.8 | 7.2 | 7.3 |
| Sulfation | Abs/.1mm | *ASTM D7415 >30 | 15.7 | 17.0 | 17.2 |

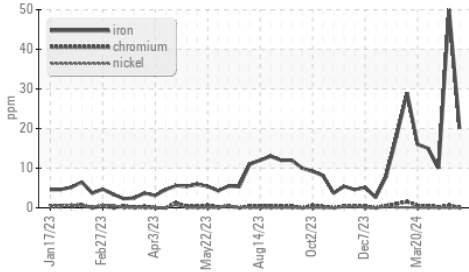
FLUID DEGRADATION

| | method | limit/base | current | history1 | history2 |
|------------------|----------|-----------------|--------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 >25 | 10.0 | 11.9 | 12.4 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.946 | 0.46 | 0.42 |
| Base Number (BN) | mg KOH/g | ASTM D2896 8.0 | 7.63 | 8.01 | 7.55 |

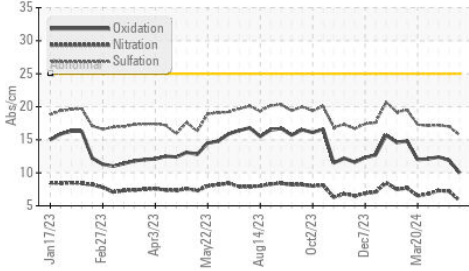


OIL ANALYSIS REPORT

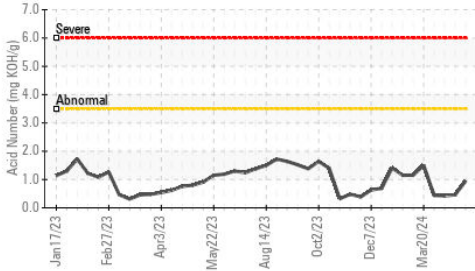
▲ Ferrous Alloys



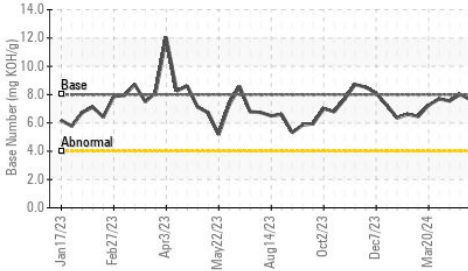
FT-IR (Direct Trend)



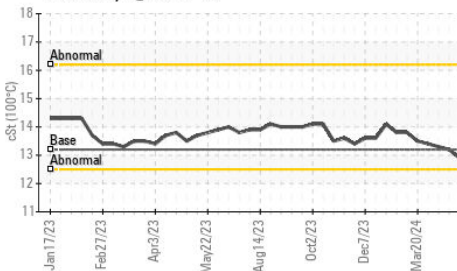
Acid Number



Base Number



Viscosity @ 100°C

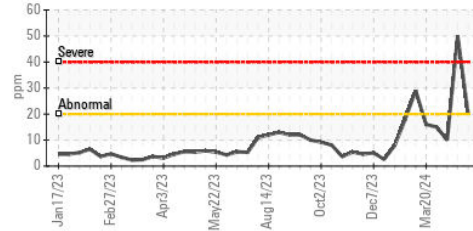


| PARAMETER | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | 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 |

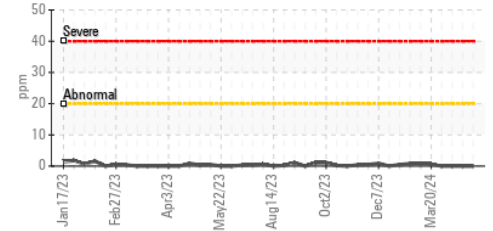
| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 13.2 | 12.9 | 13.2 |

GRAPHS

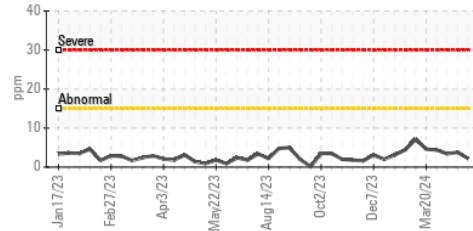
▲ Iron (ppm)



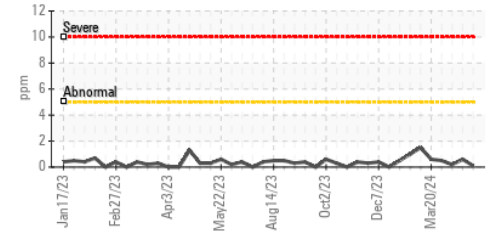
Lead (ppm)



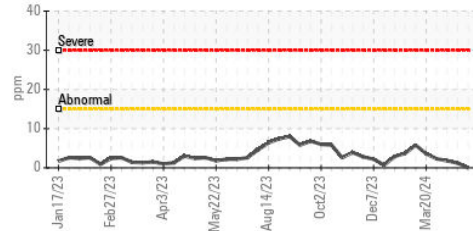
Aluminum (ppm)



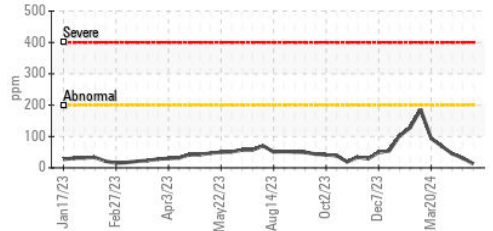
Chromium (ppm)



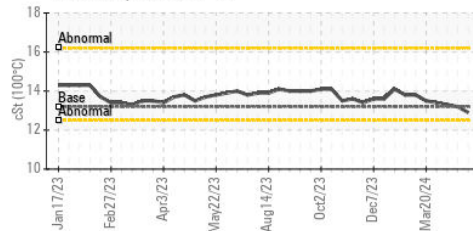
Copper (ppm)



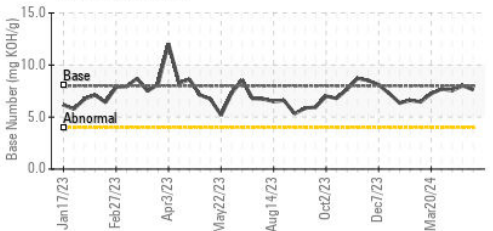
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0880435 **Received** : 22 Apr 2024
Lab Number : 06157088 **Tested** : 23 Apr 2024
Unique Number : 10992511 **Diagnosed** : 25 Apr 2024 - Jonathan Hester
Test Package : MOB 2

PINE RIDGE
 105 BAILEY JESTER RD
 GRIFFIN, GA
 US 30224

Contact: STEPHEN SAVAGE
 stephen.savage@cubedistrictenergy.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: