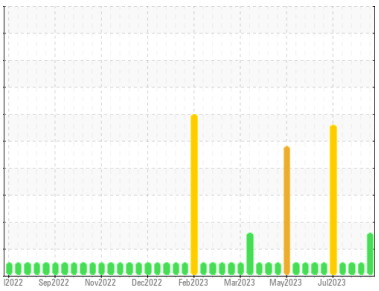
# OIL ANALYSIS REPORT

Sample Rating Trend



**DIRT**

Machine Id
## Coopersville CAT 1 CPVM01BE
Component
**Biogas Engine**
Fluid
**CHEVRON HDAX 6500 LFG GAS ENGINE OIL (--- GAL)**

## DIAGNOSIS

**▲ Recommendation**

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

**Wear**

All component wear rates are normal.

**▲ Contamination**

Elemental level of silicon (Si) above normal.

**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 | | **WC0819476** | WC0819449 | WC0819445 |
| Sample Date | | Client Info | | **23 Aug 2023** | 14 Aug 2023 | 04 Aug 2023 |
| Machine Age | hrs | Client Info | | **11813** | 11597 | 11357 |
| Oil Age | hrs | Client Info | | **668** | 452 | 212 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Not Changd |
| Sample Status | | | | **ABNORMAL** | NORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >4.0 | **<1.0** | <1.0 | <1.0 |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >15 | **8** | 3 | 0 |
| Chromium | ppm | ASTM D5185m | >4 | **<1** | <1 | 0 |
| Nickel | ppm | ASTM D5185m | >2 | **<1** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >5 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >6 | **2** | 4 | 2 |
| Lead | ppm | ASTM D5185m | >9 | **2** | 1 | 2 |
| Copper | ppm | ASTM D5185m | >14 | **3** | 2 | 3 |
| Tin | ppm | ASTM D5185m | >4 | **7** | 5 | 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 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **2** | <1 | 2 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **11** | 15 | 10 |
| Calcium | ppm | ASTM D5185m | | **1708** | 1786 | 1864 |
| Phosphorus | ppm | ASTM D5185m | | **262** | 272 | 266 |
| Zinc | ppm | ASTM D5185m | | **335** | 326 | 334 |
| Sulfur | ppm | ASTM D5185m | | **2067** | 2069 | 1979 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >181 | **▲ 200** | 145 | 100 |
| Sodium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 0 | 1 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | | **0** | 0 | 0 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **6.8** | 5.7 | 5.6 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **17.7** | 17.3 | 16.4 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **13.2** | 11.4 | 9.8 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 1.2 | **1.64** | 1.12 | 0.71 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 4.5 | **4.64** | 4.85 | 4.52 |

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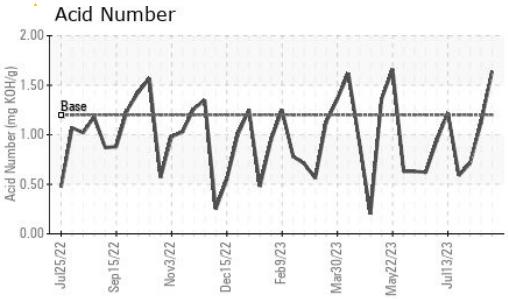
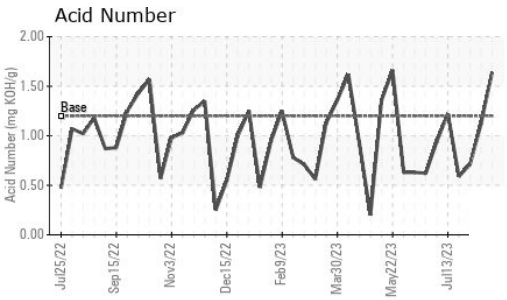
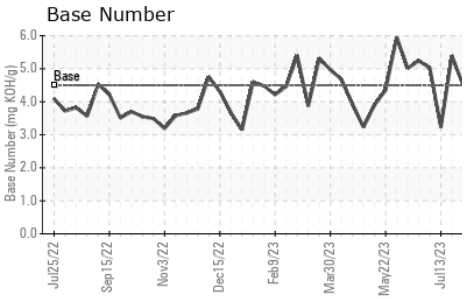
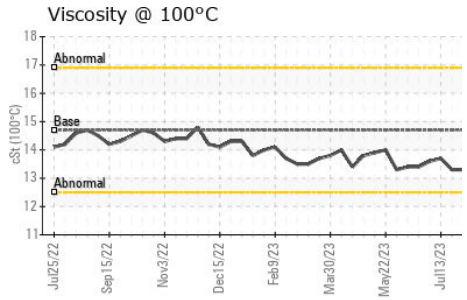


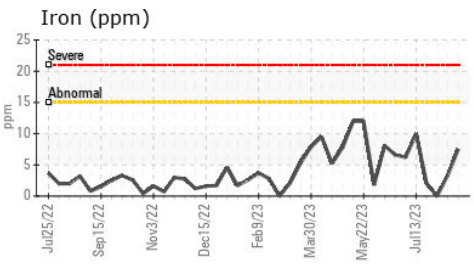



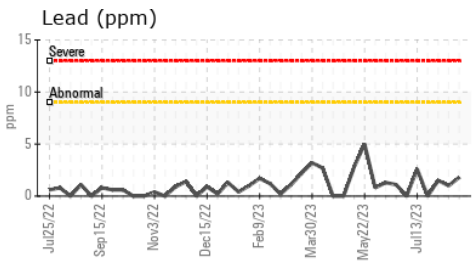



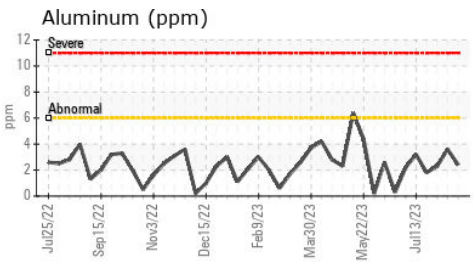

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

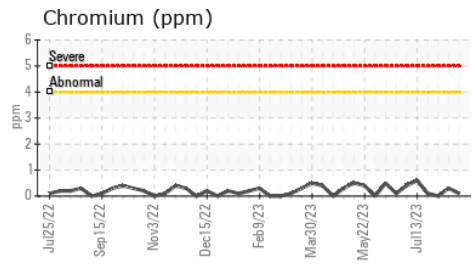
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 14.7 | **13.5** | 13.4 | 13.3 |

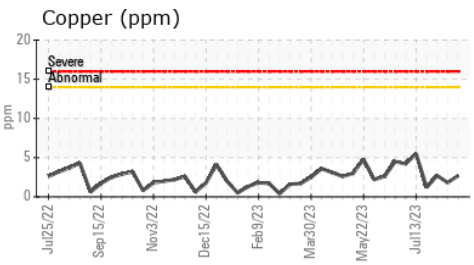
## GRAPHS

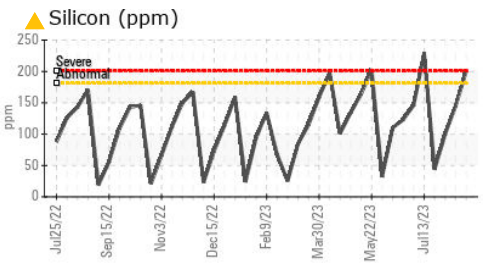


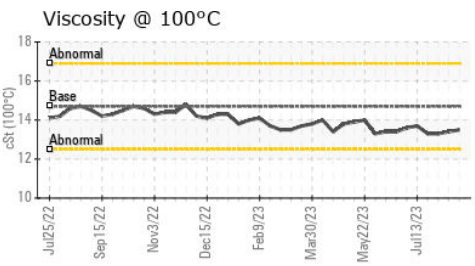



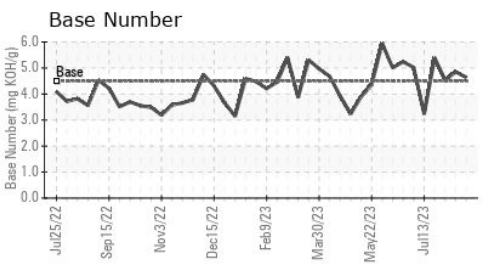




**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0819476
**Lab Number** : 05934958
**Unique Number** : 10620229
**Test Package** : MOB 2

**Received** : 25 Aug 2023
**Diagnosed** : 28 Aug 2023
**Diagnostician** : Don Baldridge

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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