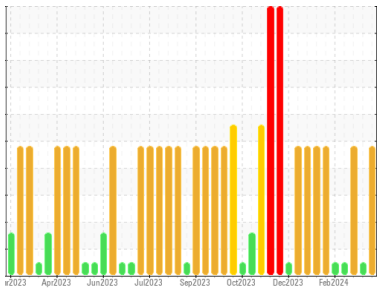
# OIL ANALYSIS REPORT

Sample Rating Trend



DIRT

Machine Id
## DECM01BE (S/N ZBA01290)
Component
**Biogas Engine**
Fluid
**CHEVRON HDAX 9500 GAS ENGINE OIL 40 (100 GAL)**

## DIAGNOSIS

**▲ Recommendation**
We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition. ( Customer Sample Comment: Top Up Amount: 10 GAL )

**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.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0732897** | WC0732895 | WC0732891 |
| Sample Date | | Client Info | | **10 Apr 2024** | 03 Apr 2024 | 12 Mar 2024 |
| Machine Age | hrs | Client Info | | **58504** | 58345 | 58147 |
| Oil Age | hrs | Client Info | | **58345** | 56062 | 56062 |
| Oil Changed | | Client Info | | **Oil Added** | Changed | Oil Added |
| Sample Status | | | | **SEVERE** | NORMAL | SEVERE |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >4.0 | **<1.0** | <1.0 | <1.0 |
| Water | | WC Method | >.11 | **NEG** | NEG | NEG |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >15 | **3** | 3 | 2 |
| Chromium | ppm | ASTM D5185m | >4 | **<1** | 0 | <1 |
| Nickel | ppm | ASTM D5185m | | **1** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Silver | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >6 | **2** | 1 | 4 |
| Lead | ppm | ASTM D5185m | >9 | **2** | <1 | 1 |
| Copper | ppm | ASTM D5185m | >6 | **2** | 1 | 2 |
| Tin | ppm | ASTM D5185m | >4 | **2** | <1 | 3 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **<1** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **6** | 7 | 6 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **12** | 11 | 8 |
| Manganese | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | | **36** | 29 | 38 |
| Calcium | ppm | ASTM D5185m | | **1938** | 1899 | 2193 |
| Phosphorus | ppm | ASTM D5185m | | **332** | 290 | 376 |
| Zinc | ppm | ASTM D5185m | | **398** | 361 | 490 |
| Sulfur | ppm | ASTM D5185m | | **2889** | 2589 | 3594 |

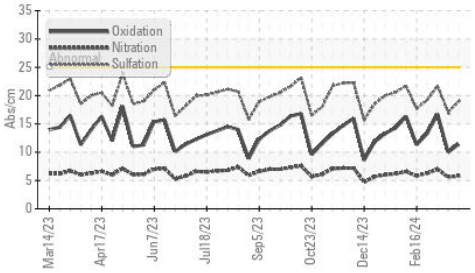
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >181 | ▲ **202** | 152 | ▲ 349 |
| Sodium | ppm | ASTM D5185m | >21 | **1** | <1 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | **4** | <1 | 4 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | | **0** | 0 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | | **5.8** | 5.6 | 7.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | | **18.9** | 17.1 | 21.7 |

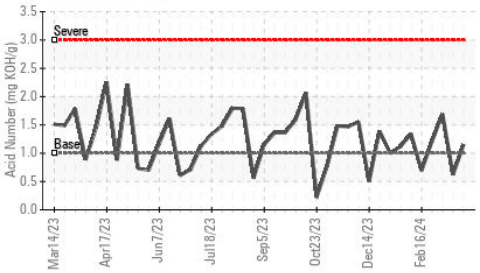
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | | **11.4** | 10.0 | 16.7 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 1.0 | **1.15** | 0.62 | 1.69 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 5.4 | **4.34** | 4.60 | 3.93 |

# OIL ANALYSIS REPORT

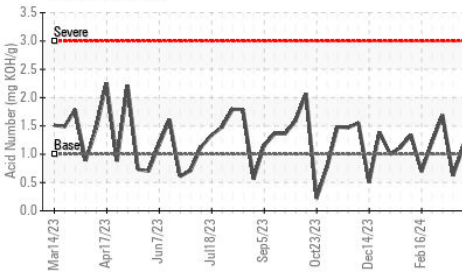
FT-IR (Direct Trend)



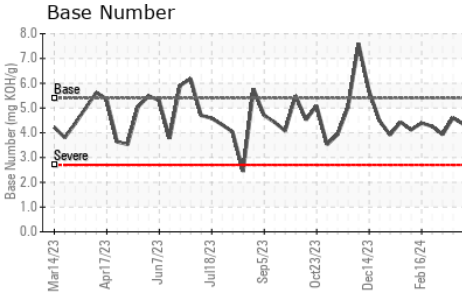

Acid Number



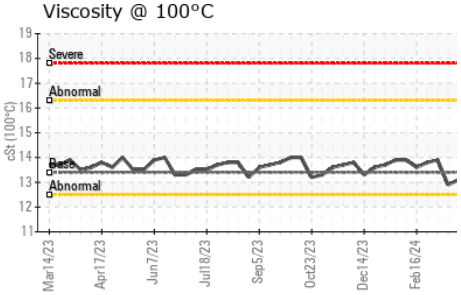

Acid Number




Base Number




Viscosity @ 100°C

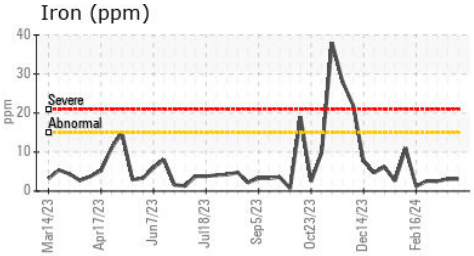



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 | >.11 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

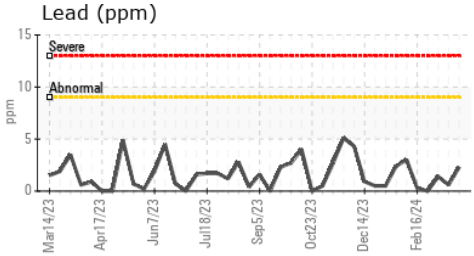
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 13.4 | **13.1** | 12.9 | 13.9 |

## GRAPHS

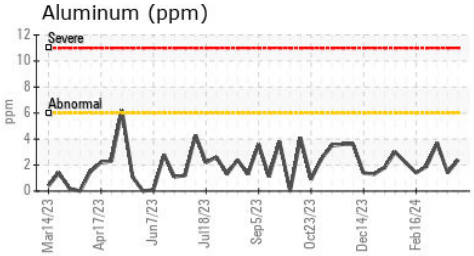
Iron (ppm)



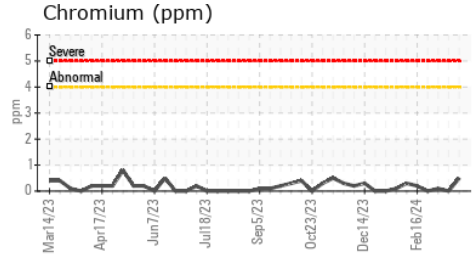

Lead (ppm)



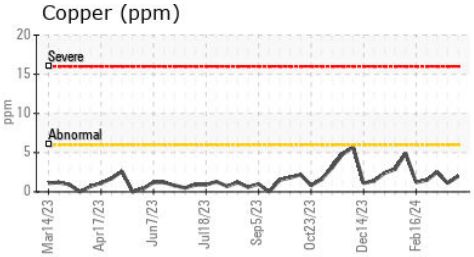

Aluminum (ppm)



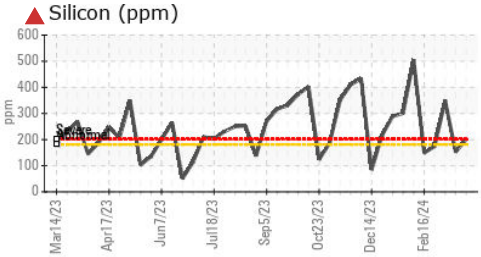

Chromium (ppm)



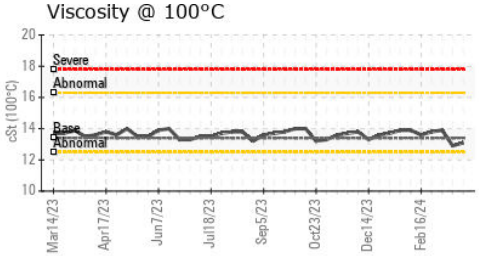

Copper (ppm)



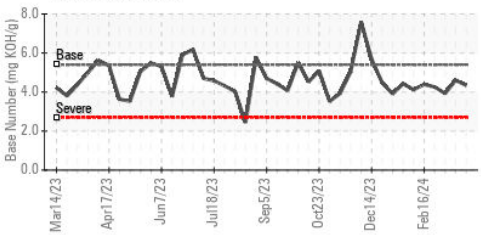

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0732897
**Lab Number** : 06147543
**Unique Number** : 10977621
**Test Package** : MOB 2

**Received** : 12 Apr 2024
**Tested** : 15 Apr 2024
**Diagnosed** : 16 Apr 2024 - Sean Felton

*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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