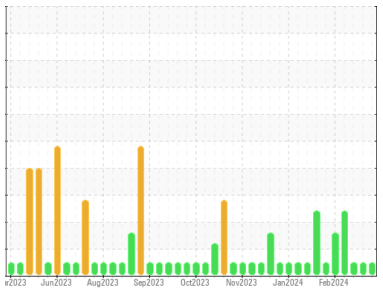
# OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Machine Id
## Byron Center CAT 2 BYCM02BE
Component
**Biogas Engine**
Fluid
**CHEVRON HDAX 9500 GAS ENGINE OIL 40 (--- GAL)**

## 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 | | **WC0640328** | WC0877091 | WC0877093 |
| Sample Date | | Client Info | | **25 Mar 2024** | 15 Mar 2024 | 07 Mar 2024 |
| Machine Age | hrs | Client Info | | **107839** | 107576 | 107395 |
| Oil Age | hrs | Client Info | | **420** | 181 | 2 |
| 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 | >0.11 | **NEG** | NEG | NEG |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >15 | **3** | 0 | 0 |
| Chromium | ppm | ASTM D5185m | >4 | **0** | 0 | 0 |
| Nickel | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >6 | **2** | 1 | 1 |
| Lead | ppm | ASTM D5185m | >9 | **2** | 2 | <1 |
| Copper | ppm | ASTM D5185m | >6 | **<1** | <1 | 0 |
| Tin | ppm | ASTM D5185m | >4 | **3** | 2 | <1 |
| 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 | | **2** | 2 | 2 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Manganese | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | | **16** | 13 | 18 |
| Calcium | ppm | ASTM D5185m | | **1777** | 1696 | 1589 |
| Phosphorus | ppm | ASTM D5185m | | **286** | 251 | 249 |
| Zinc | ppm | ASTM D5185m | | **343** | 288 | 294 |
| Sulfur | ppm | ASTM D5185m | | **3554** | 2951 | 1940 |

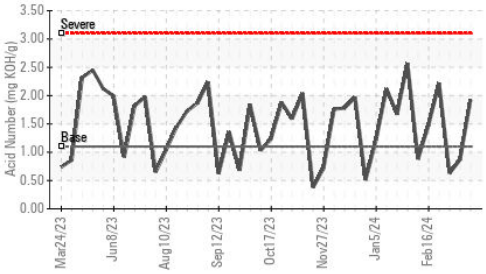
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >181 | **151** | 76 | 14 |
| Sodium | ppm | ASTM D5185m | >21 | **<1** | 1 | <1 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 0 | 0 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | | **0** | 0 | 0 |
| Nitration | Abs/cm | *ASTM D7624 | | **5.6** | 5.3 | 4.8 |
| Sulfation | Abs/.1mm | *ASTM D7415 | | **23.6** | 19.2 | 14.9 |

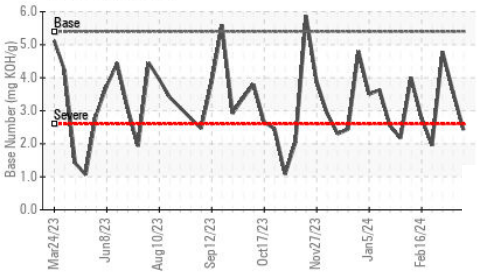
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | | **14.7** | 10.3 | 7.9 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 1.1 | **1.92** | 0.87 | 0.628 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 5.4 | **2.42** | 3.57 | 4.79 |

# OIL ANALYSIS REPORT

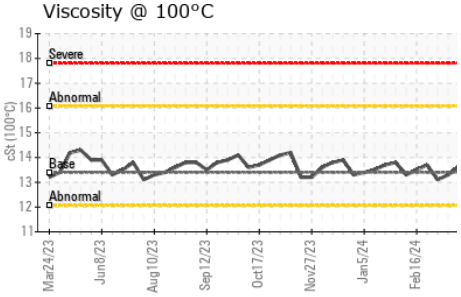
Acid Number




Base Number




Viscosity @ 100°C

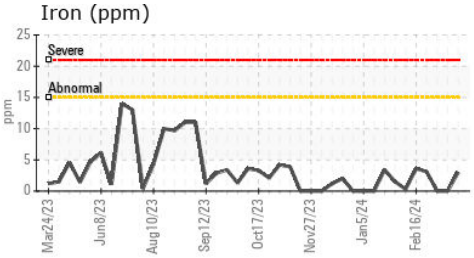



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 | >0.11 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

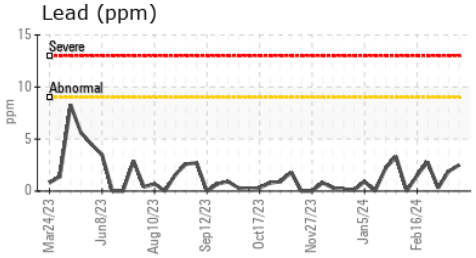
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 13.4 | **13.6** | 13.3 | 13.1 |

## GRAPHS

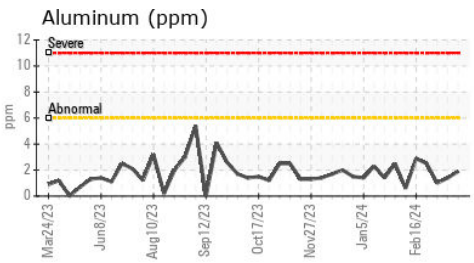
Iron (ppm)



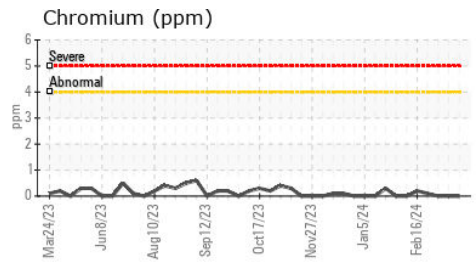

Lead (ppm)



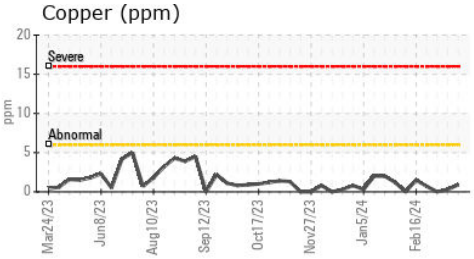

Aluminum (ppm)



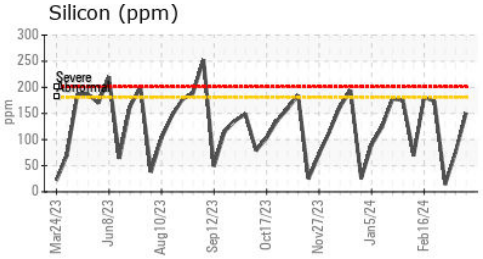

Chromium (ppm)



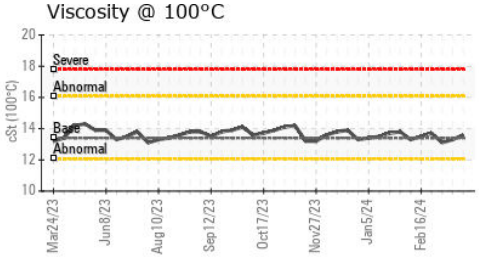

Copper (ppm)



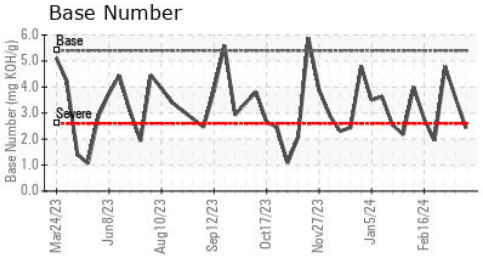

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0640328
**Lab Number** : 06130796
**Unique Number** : 10950261
**Test Package** : MOB 2

**Received** : 27 Mar 2024
**Tested** : 28 Mar 2024
**Diagnosed** : 01 Apr 2024 - Jonathan Hester

*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)*

**EDL NA Recips-Byron Center**
Byron Center Powerstation, 10310 South Kent Road
Byron Center, MI
US 49315
Contact: Jake Ripke
Jake.Ripke@edlenergy.com
T:
F:

Report Id: EDLBYR [WUSCAR] 06130796 (Generated: 04/01/2024 14:01:41) Rev: 1

Submitted By: STEWART WESLEY