

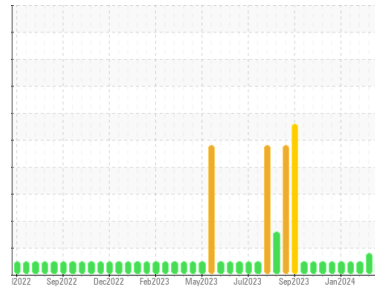


# OIL ANALYSIS REPORT



Machine Id  
**Coopersville CAT 7 CPVM07BE**  
 Component  
**Biogas Engine**  
 Fluid  
**CHEVRON HDAX 9500 GAS ENGINE OIL 40 (125 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 |             | <b>WC0871591</b>   | WC0871586   | WC0871528   |
| Sample Date   | Client Info |             | <b>29 Mar 2024</b> | 20 Mar 2024 | 20 Feb 2024 |
| Machine Age   | hrs         | Client Info | <b>107750</b>      | 107537      | 106872      |
| Oil Age       | hrs         | Client Info | <b>1</b>           | 665         | 1           |
| Oil Changed   | Client Info |             | <b>Changed</b>     | Not Changd  | Changed     |
| Sample Status |             |             | <b>NORMAL</b>      | ABNORMAL    | NORMAL      |

## CONTAMINATION

|        | method    | limit/base | current        | history1 | history2 |
|--------|-----------|------------|----------------|----------|----------|
| Fuel   | WC Method | >4.0       | <b>&lt;1.0</b> | <1.0     | <1.0     |
| Water  | WC Method |            | <b>NEG</b>     | NEG      | NEG      |
| Glycol | WC Method |            | <b>NEG</b>     | NEG      | NEG      |

## WEAR METALS

|          | method | limit/base      | current      | history1 | history2 |
|----------|--------|-----------------|--------------|----------|----------|
| Iron     | ppm    | ASTM D5185m >14 | <b>0</b>     | 2        | 0        |
| Chromium | ppm    | ASTM D5185m >3  | <b>0</b>     | 0        | 0        |
| Nickel   | ppm    | ASTM D5185m     | <b>0</b>     | <1       | <1       |
| Titanium | ppm    | ASTM D5185m     | <b>&lt;1</b> | 0        | 0        |
| Silver   | ppm    | ASTM D5185m     | <b>0</b>     | 0        | 0        |
| Aluminum | ppm    | ASTM D5185m >5  | <b>1</b>     | 3        | 2        |
| Lead     | ppm    | ASTM D5185m >8  | <b>0</b>     | 5        | <1       |
| Copper   | ppm    | ASTM D5185m >5  | <b>&lt;1</b> | 2        | 1        |
| Tin      | ppm    | ASTM D5185m >3  | <b>0</b>     | ▲ 6      | 1        |
| Vanadium | ppm    | ASTM D5185m     | <b>&lt;1</b> | 0        | 0        |
| Cadmium  | ppm    | ASTM D5185m     | <b>0</b>     | 0        | 0        |

## ADDITIVES

|            | method | limit/base  | current     | history1 | history2 |
|------------|--------|-------------|-------------|----------|----------|
| Boron      | ppm    | ASTM D5185m | <b>2</b>    | 1        | 2        |
| Barium     | ppm    | ASTM D5185m | <b>0</b>    | 0        | 0        |
| Molybdenum | ppm    | ASTM D5185m | <b>1</b>    | 1        | 0        |
| Manganese  | ppm    | ASTM D5185m | <b>0</b>    | <1       | <1       |
| Magnesium  | ppm    | ASTM D5185m | <b>8</b>    | 9        | 9        |
| Calcium    | ppm    | ASTM D5185m | <b>1632</b> | 1857     | 1594     |
| Phosphorus | ppm    | ASTM D5185m | <b>222</b>  | 292      | 251      |
| Zinc       | ppm    | ASTM D5185m | <b>287</b>  | 346      | 305      |
| Sulfur     | ppm    | ASTM D5185m | <b>1806</b> | 2367     | 1490     |

## CONTAMINANTS

|           | method | limit/base       | current      | history1 | history2 |
|-----------|--------|------------------|--------------|----------|----------|
| Silicon   | ppm    | ASTM D5185m >180 | <b>15</b>    | 173      | 19       |
| Sodium    | ppm    | ASTM D5185m >20  | <b>&lt;1</b> | 2        | <1       |
| Potassium | ppm    | ASTM D5185m >20  | <b>0</b>     | 2        | 1        |

## INFRA-RED

|           | method   | limit/base  | current     | history1 | history2 |
|-----------|----------|-------------|-------------|----------|----------|
| Soot %    | %        | *ASTM D7844 | <b>0</b>    | 0.1      | 0        |
| Nitration | Abs/cm   | *ASTM D7624 | <b>4.9</b>  | 7.2      | 5.0      |
| Sulfation | Abs/.1mm | *ASTM D7415 | <b>14.9</b> | 20.0     | 14.8     |

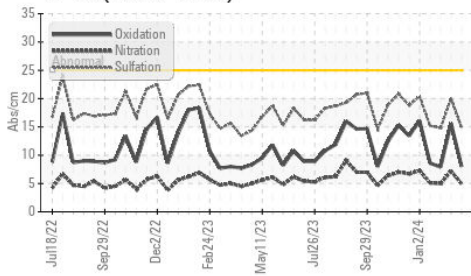
## FLUID DEGRADATION

|                  | method   | limit/base     | current     | history1 | history2 |
|------------------|----------|----------------|-------------|----------|----------|
| Oxidation        | Abs/.1mm | *ASTM D7414    | <b>8.0</b>  | 15.6     | 7.9      |
| Acid Number (AN) | mg KOH/g | ASTM D8045 1.0 | <b>0.46</b> | 1.39     | 0.604    |
| Base Number (BN) | mg KOH/g | ASTM D2896 5.4 | <b>4.99</b> | 4.36     | 5.44     |

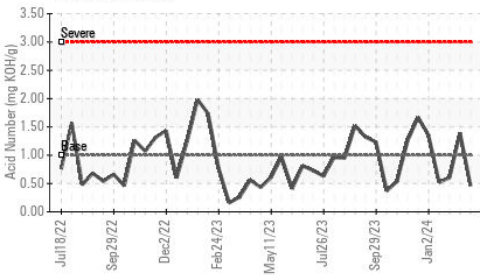


# OIL ANALYSIS REPORT

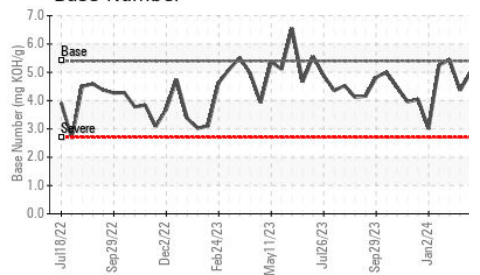
FT-IR (Direct Trend)



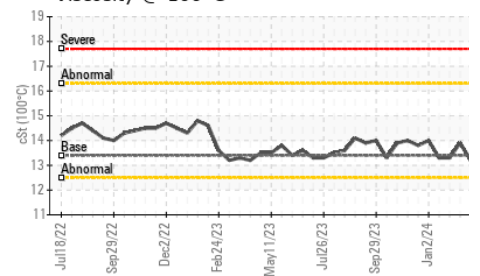
Acid Number



Base Number



Viscosity @ 100°C

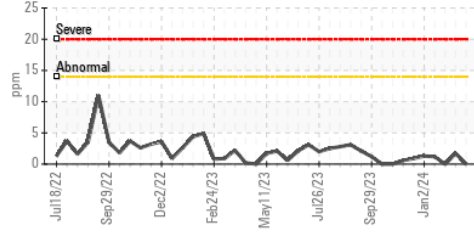


| VISUAL           | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal      | scalar | *Visual    | NONE    | NONE     | NONE     |
| Yellow Metal     | scalar | *Visual    | NONE    | NONE     | NONE     |
|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

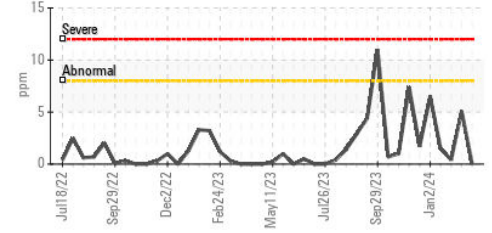
| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 100°C     | cSt    | ASTM D445  | 13.4    | 13.2     | 13.9     |

## GRAPHS

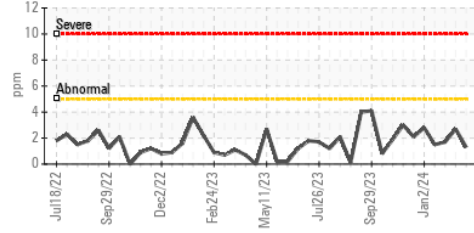
Iron (ppm)



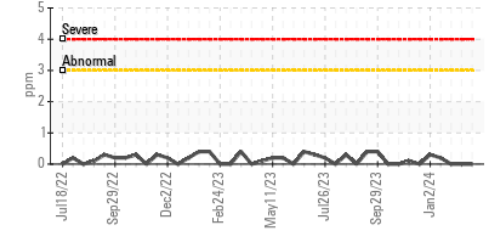
Lead (ppm)



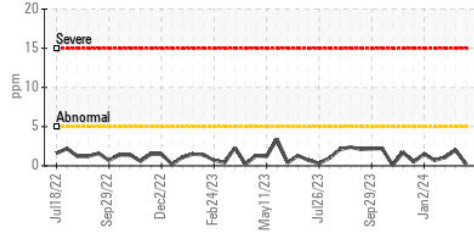
Aluminum (ppm)



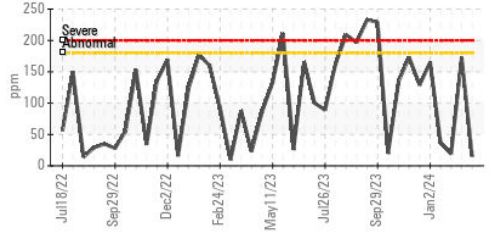
Chromium (ppm)



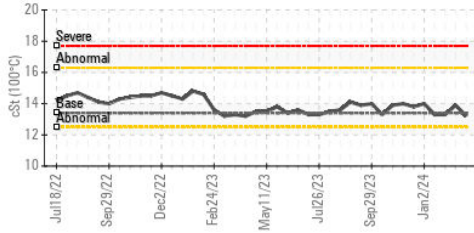
Copper (ppm)



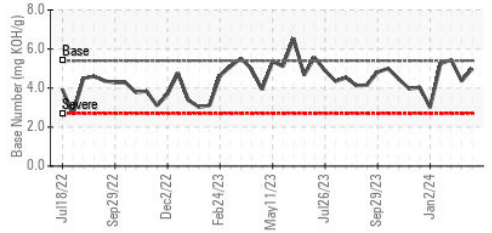
Silicon (ppm)



Viscosity @ 100°C



Base Number



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC0871591 **Received** : 04 Apr 2024  
**Lab Number** : 06138722 **Tested** : 05 Apr 2024  
**Unique Number** : 10963530 **Diagnosed** : 06 Apr 2024 - Don Baldrige  
**Test Package** : MOB 2

**EDL NA Recips-Coopersville**  
 Coopersville Powerstation, 15362 68th Avenue  
 Coopersville, MI  
 US 49404  
 Contact: Daniel Young  
 daniel.young@edlenergy.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)