

OIL ANALYSIS REPORT



Machine Id Coopersville CAT 6 CPVM06BE

Biogas Engine

CHEVRON HDAX 9500 GAS ENGINE OIL 40 (105 GAL)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

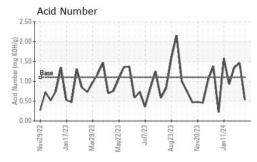
Fluid Condition

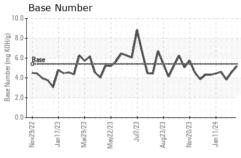
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

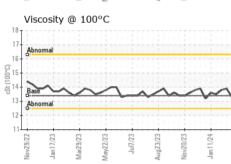
| <u> </u> | | v2022 Jan20. | 23 Mar2023 May2023 | Jul2023 Aug2023 Nov2023 | | |
|---|--|---|---|---|---|---|
| SAMPLE INFORM | ATION | method | limit/base | current | history1 | history2 |
| Sample Number | | Client Info | | WC0871526 | WC0871551 | WC0871548 |
| Sample Date | | Client Info | | 15 Feb 2024 | 05 Feb 2024 | 29 Jan 2024 |
| Machine Age | hrs | Client Info | | 30703 | 30461 | 30295 |
| Oil Age | hrs | Client Info | | 1 | 811 | 644 |
| Oil Changed | | Client Info | | Changed | Not Changd | Not Changd |
| Sample Status | | | | NORMAL | SEVERE | SEVERE |
| CONTAMINATION | J | method | limit/base | current | history1 | history2 |
| Fuel | V | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| | | | | <1.0 NEG | NEG | NEG |
| Water | | | >0.1 | | | |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METALS | | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >15 | <1 | 3 | 3 |
| Chromium | ppm | ASTM D5185m | >4 | 0 | 0 | <1 |
| 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 | 2 | 3 |
| Lead | ppm | ASTM D5185m | >9 | 0 | 0 | 3 |
| Copper | ppm | ASTM D5185m | >14 | 2 | 6 | 8 |
| Tin | ppm | ASTM D5185m | >4 | 2 | 7 | 9 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | historv2 |
| ADDITIVES | nnm | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | limit/base | 4 | 0 | 2 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | limit/base | 4 0 | 0 | 2 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 | 0 0 1 | 2 0 2 |
| Boron Barium Molybdenum Manganese | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 <1 | 0 0 1 0 | 2 0 2 2 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 <1 13 | 0 0 1 0 8 | 2 0 2 2 10 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 <1 13 1584 | 0 0 1 0 8 1966 | 2 0 2 2 10 1761 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 <1 13 1584 254 | 0 0 1 0 8 1966 294 | 2 0 2 2 10 1761 274 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 <1 13 1584 254 | 0 0 1 0 8 1966 294 370 | 2 0 2 2 10 1761 274 341 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 <1 13 1584 254 | 0 0 1 0 8 1966 294 | 2 0 2 2 10 1761 274 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 4 0 4 <1 13 1584 254 | 0 0 1 0 8 1966 294 370 | 2 0 2 2 10 1761 274 341 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | | 4 0 4 <1 13 1584 254 310 1577 | 0 0 1 0 8 1966 294 370 1848 | 2 0 2 2 10 1761 274 341 1728 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | limit/base | 4 0 4 <1 13 1584 254 310 1577 | 0 0 1 0 8 1966 294 370 1848 | 2 0 2 2 10 1761 274 341 1728 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | limit/base >181 | 4 0 4 <1 13 1584 254 310 1577 current | 0 0 1 0 8 1966 294 370 1848 history1 | 2 0 2 2 10 1761 274 341 1728 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | limit/base >181 | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 | 0 0 1 0 8 1966 294 370 1848 history1 ▲ 223 | 2 0 2 2 10 1761 274 341 1728 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | limit/base >181 >20 | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 | 0 0 1 0 8 1966 294 370 1848 history1 ▲ 223 <1 0 | 2 0 2 2 10 1761 274 341 1728 history2 203 3 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | limit/base >181 >20 limit/base | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 2 current | 0 0 1 0 8 1966 294 370 1848 history1 ▲ 223 <1 0 | 2 0 2 10 1761 274 341 1728 history2 10 1761 274 341 1728 0 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D5185m | limit/base >181 >20 limit/base | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 2 | 0 0 1 0 8 1966 294 370 1848 history1 ▲ 223 <1 0 | 2 0 2 10 1761 274 341 1728 history2 ▲ 203 3 4 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m Method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D76145 | limit/base >181 >20 limit/base >20 >30 | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 2 current 0 5.1 15.1 | 0 0 1 0 8 1966 294 370 1848 history1 ▲ 223 <1 0 history1 0.1 7.5 19.4 | 2 0 2 10 1761 274 341 1728 history2 ▲ 203 3 4 history2 0 7.1 18.6 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m Method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method *ASTM D7844 *ASTM D7624 *ASTM D7415 Method | limit/base >181 >20 limit/base >20 >30 limit/base | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 2 current 0 5.1 15.1 current | 0 0 1 0 8 1966 294 370 1848 history1 ▲ 223 <1 0 history1 0.1 7.5 19.4 history1 | 2 0 2 2 10 1761 274 341 1728 history2 ▲ 203 3 4 history2 0 7.1 18.6 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m METHOD *ASTM D5185m ASTM D5185m *ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7415 *ASTM D7414 | limit/base >181 >20 limit/base >20 >30 limit/base >25 | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 2 current 0 5.1 15.1 current 8.4 | 0 0 1 0 8 1966 294 370 1848 history1 △ 223 <1 0 history1 0.1 7.5 19.4 history1 16.1 | 2 0 2 10 1761 274 341 1728 history2 203 3 4 history2 0 7.1 18.6 history2 14.7 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m METHOD *ASTM D5185m ASTM D5185m *ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7415 *ASTM D7414 | limit/base >181 >20 limit/base >20 >30 limit/base | 4 0 4 <1 13 1584 254 310 1577 current 36 <1 2 current 0 5.1 15.1 current | 0 0 1 0 8 1966 294 370 1848 history1 ▲ 223 <1 0 history1 0.1 7.5 19.4 history1 | 2 0 2 2 10 1761 274 341 1728 history2 ▲ 203 3 4 history2 0 7.1 18.6 history2 |



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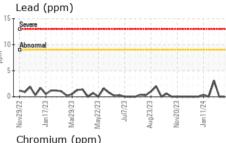


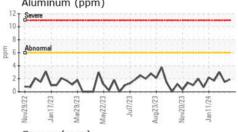


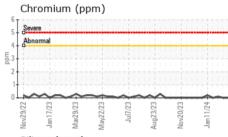
| VISUAL | | method | limit/base | current | history1 | history2 |
|-------------------------|--------|---------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate |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

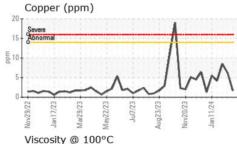
| FLUID PROPER | HES | metnoa | ilmit/base | current | nistory i | nistory2 |
|--------------|-----|-----------|------------|---------|-----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 13.4 | 13.3 | 13.9 | 13.8 |

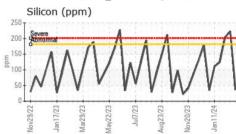
| Iror | n (ppi | m) | | | | | |
|------------|--------|----------|--------|---------------|----------|----------|----------|
| 30- | | | 1 | | | 1 | |
| 20 - Sever | | \wedge | -+ | N_{Λ} | - | +- | |
| 10- | 1 | V | W | 7 | W | 1 | |
| 9/22 | 1/23 | 9/23 | 2/23 | Jul7/23 | 3/23 | 0/23 | |
| Nov29/22 | Jan | Mar29/ | May22/ | Jul | Aug23/23 | Nov20/23 | Jan11/24 |
| Aluı | minur | n (pp | m) | | | | |

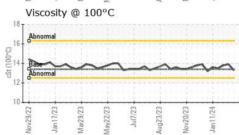


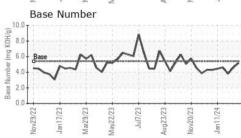
















Laboratory Sample No. Lab Number : 06098633 Unique Number: 10896863

: WC0871526

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received Tested

: 23 Feb 2024

: 26 Feb 2024

: 26 Feb 2024 - Sean Felton

EDL NA Recips-Coopersville Coopersville Powerstation, 15362 68th Avenue

Coopersville, MI US 49404

Test Package : MOB 2 Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369.

Contact: Daniel Young daniel.young@edlenergy.com

* - 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)

Diagnosed

T:

F: