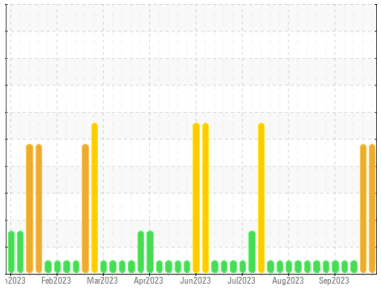
# OIL ANALYSIS REPORT

Machine Id
**SJNM01BE**
Component
**Biogas Engine**
Fluid
**CHEVRON HDAX 6500 LFG GAS ENGINE OIL (--- GAL)**

Sample Rating Trend



**DIRT**

## DIAGNOSIS

**Recommendation**
The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

**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 | | **WC0764363** | WC0764359 | WC0764362 |
| Sample Date | | Client Info | | **12 Oct 2023** | 05 Oct 2023 | 28 Sep 2023 |
| Machine Age | hrs | Client Info | | **67432** | 67265 | 67101 |
| Oil Age | hrs | Client Info | | **982** | 815 | 651 |
| Oil Changed | | Client Info | | **Changed** | Not Changd | Not Changd |
| Sample Status | | | | **SEVERE** | SEVERE | 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** | 6 | 10 |
| Chromium | ppm | ASTM D5185m | >4 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **<1** | 2 | <1 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >5 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >6 | **<1** | 0 | <1 |
| Lead | ppm | ASTM D5185m | >9 | **6** | 8 | 6 |
| Copper | ppm | ASTM D5185m | >6 | **3** | 3 | 1 |
| Tin | ppm | ASTM D5185m | >4 | **3** | 4 | 4 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

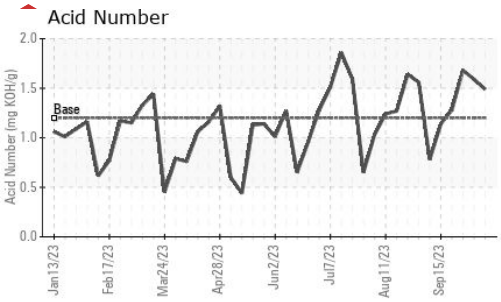
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **8** | 10 | 16 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **8** | 10 | 8 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **14** | 23 | 24 |
| Calcium | ppm | ASTM D5185m | | **1845** | 1996 | 2015 |
| Phosphorus | ppm | ASTM D5185m | | **255** | 308 | 328 |
| Zinc | ppm | ASTM D5185m | | **319** | 410 | 400 |
| Sulfur | ppm | ASTM D5185m | | **1938** | 2528 | 2301 |

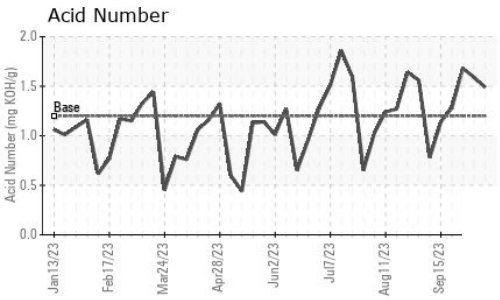
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >181 | **221** | 223 | 171 |
| Sodium | ppm | ASTM D5185m | | **34** | 41 | 31 |
| Potassium | ppm | ASTM D5185m | >20 | **0** | 4 | 1 |

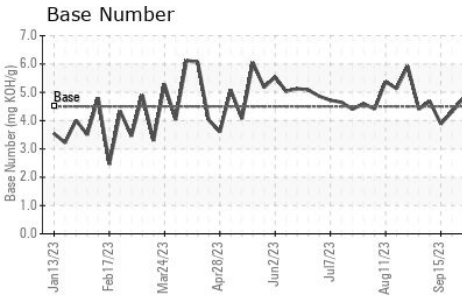
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | | **0.1** | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **8.0** | 8.0 | 7.5 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **23.8** | 23.8 | 21.9 |

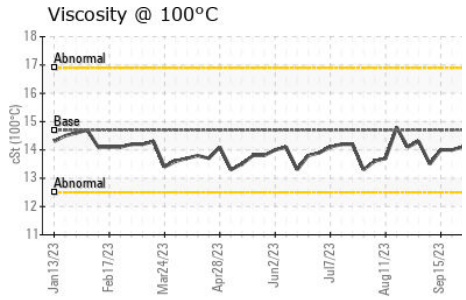
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.9** | 18.0 | 14.7 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 1.2 | **1.49** | 1.59 | 1.68 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 4.5 | **4.67** | 4.71 | 4.75 |

# OIL ANALYSIS REPORT



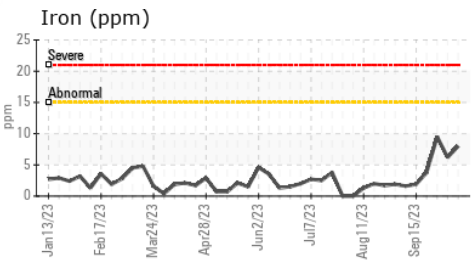



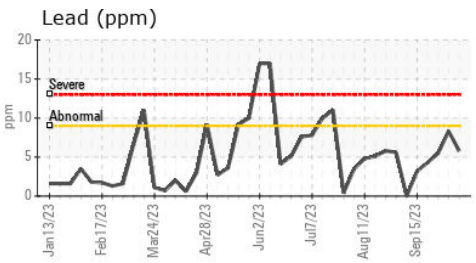



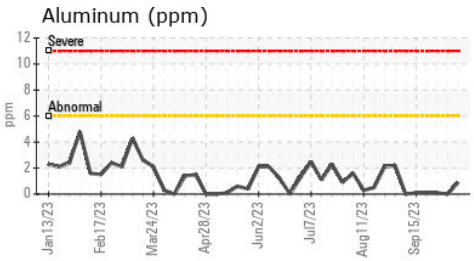

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

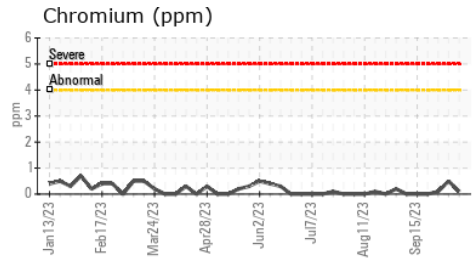
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 14.7 | **14.5** | 14.4 | 14.1 |

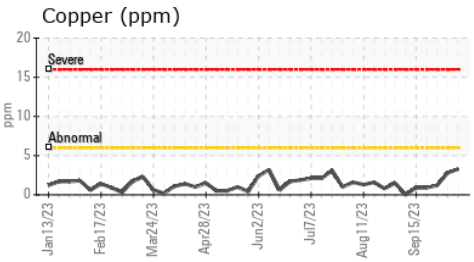
## GRAPHS

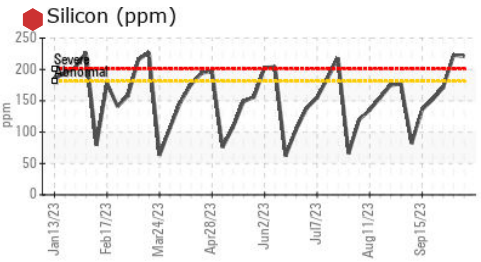


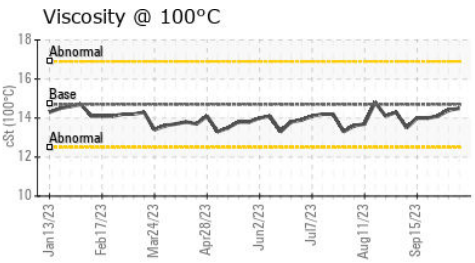



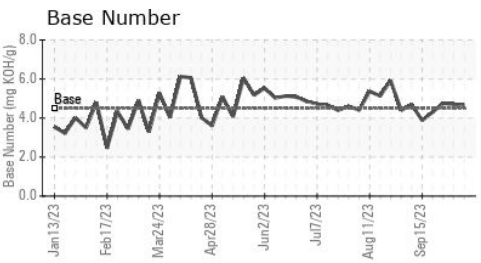




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0764363
**Lab Number** : 05979898
**Unique Number** : 10697193
**Test Package** : MOB 2

**Received** : 16 Oct 2023
**Diagnosed** : 18 Oct 2023
**Diagnostician** : 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)*

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Report Id: EDLSOU [WUSCAR] 05979898 (Generated: 10/18/2023 14:29:24) Rev: 1

Submitted By: Aaron Klein