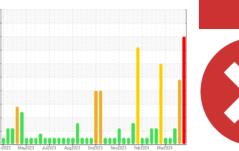


OIL ANALYSIS REPORT

Sample Rating Trend







Grand Blanc CAT 4 GBLM04BE

Biogas Engine

CHEVRON HDAX 9500 GAS ENGINE OIL 40 (--- GAL)

DIAGNOSIS

▲ Recommendation

Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. (Customer Sample Comment: 950hr End of Cycle Oil sample)

Wear

All component wear rates are normal.

Contamination

Elemental level of silicon (Si) above normal.

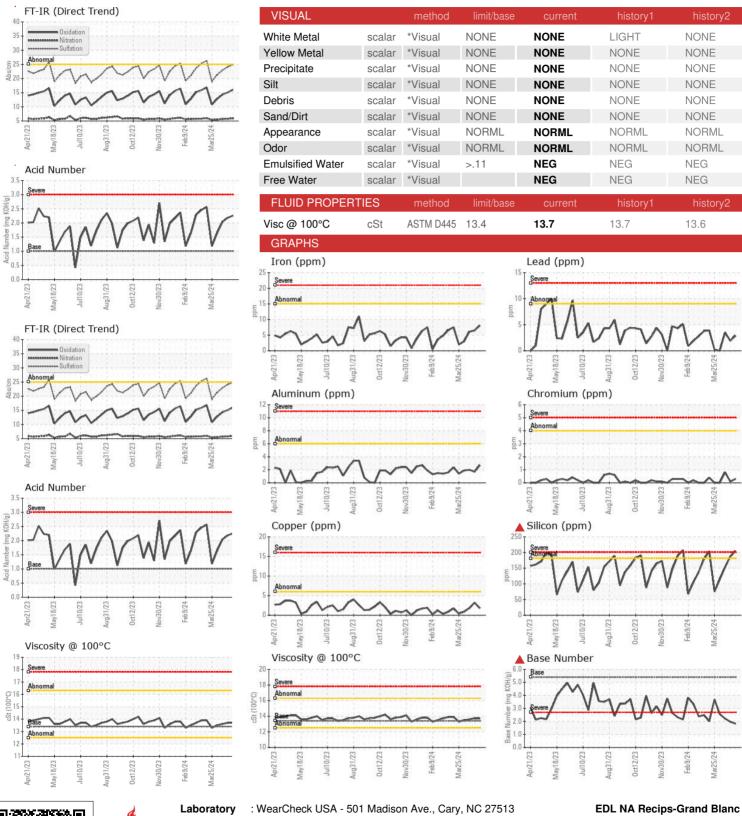
▲ Fluid Condition

The BN level is low. The AN level is acceptable for this fluid.

SAMPLE INFORMATION Sample Number Sample Date Machine Age hrs Oil Age hrs Oil Changed Sample Status CONTAMINATION Fuel Water Glycol WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sumple Status CONTAMINANTS Silicon ppm CONTAMINANTS Silicon ppm CONTAMINANTS	Client Info MC Method WC Method WC Method WC Method ASTM D5185m	limit/base	current WC0905701 24 Apr 2024 69243 950 Changed SEVERE current <1.0 NEG NEG Current 8 <1 0 <1 0 3 3 2 2 2 0 0	history1 WC0905672 18 Apr 2024 69082 795 Not Changd SEVERE history1 <1.0 NEG NEG 0 0 0 2 2 3 3 0 0	history2 WC0905753 10 Apr 2024 68870 0 N/A ABNORMAL history2 <1.0 NEG NEG 1 1 <1 0 2 4 2 3 <11
Sample Date Machine Age hrs Dil Age hrs Dil Age hrs Dil Changed Sample Status CONTAMINATION Fuel Water Glycol WEAR METALS fron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Cadmium ppm Barium ppm Molybdenum ppm Manganese ppm Manganese ppm Calcium ppm Phosphorus ppm Sulfur ppm Sulfur ppm Calcium ppm Contaminants	Client Info Client Info Client Info Client Info Client Info Client Info WC Method WC Method WC Method WC Method ASTM D5185m	>4.0 >.11 limit/base >15 >4 >6 >9 >6 >4	24 Apr 2024 69243 950 Changed SEVERE	18 Apr 2024 69082 795 Not Changd SEVERE history1 <1.0 NEG NEG 0 0 2 2 3 3 0	10 Apr 2024 68870 0 N/A ABNORMAL history2 <1.0 NEG NEG 6 <1 1 <1 0 2 4 2 3
Machine Age hrs Dil Age hrs Dil Age hrs Dil Changed Gample Status CONTAMINATION Fuel Water Glycol WEAR METALS ron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Dadmium ppm Dadmium ppm Dadmium ppm Dadmium ppm Calcium ppm Manganese ppm Magnesium ppm Calcium ppm Chosphorus ppm Contamination ppm Calcium ppm Calcium ppm Chosphorus ppm Contamination ppm Calcium ppm Contamination ppm Calcium ppm Contamination ppm Calcium ppm Contamination ppm	Client Info Client Info Client Info Client Info Client Info WC Method WC Method WC Method ASTM D5185m	>4.0 >.11 limit/base >15 >4 >6 >9 >6 >4	69243 950 Changed SEVERE	69082 795 Not Changd SEVERE history1 <1.0 NEG NEG 0 0 2 2 3 3 0	68870 0 N/A ABNORMAL history2 <1.0 NEG NEG 1 1 2 4 2 3
Dil Age hrs Dil Changed Sample Status CONTAMINATION Fuel Water Glycol WEAR METALS ron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Barium ppm Molybdenum ppm Manganese ppm Calcium ppm	Client Info Client Info Client Info Method WC Method WC Method WC Method ASTM D5185m	>4.0 >.11 limit/base >15 >4 >6 >9 >6 >4	950 Changed SEVERE current <1.0 NEG NEG current 8 <1 0 <1 0 3 3 2 2 0 0	795 Not Changd SEVERE history1 <1.0 NEG NEG 0 0 2 2 3 3 0	0 N/A ABNORMAL history2 <1.0 NEG NEG history2 6 <11 1 <1 0 2 4 2 3
CONTAMINATION Fuel Water Glycol WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm Sulfur ppm Calcium ppm	Method WC Method WC Method WC Method WC Method MSTM D5185m ASTM D5185m	>4.0 >.11 limit/base >15 >4 >6 >9 >6 >4	Changed SEVERE current <1.0 NEG NEG Current 8 <1 0 <1 0 3 3 2 2 0 0	Not Changd SEVERE history1 <1.0 NEG NEG history1 6 <1 0 0 2 2 3 3 0	N/A ABNORMAL history2 <1.0 NEG NEG 1 1 1 2 4 2 3
CONTAMINATION Fuel Water Glycol WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Manganese ppm Manganese ppm Calcium ppm Phosphorus ppm Pinc ppm Sulfur ppm Contamination ppm Calcium ppm	method WC Method WC Method WC Method WC Method ASTM D5185m	>4.0 >.11 limit/base >15 >4 >6 >9 >6 >4	SEVERE current <1.0 NEG NEG current 8 <1 0 <1 0 3 3 2 2 0 0	SEVERE history1 <1.0 NEG NEG history1 6 <1 0 0 2 2 2 3 3 0	ABNORMAL history2 <1.0 NEG NEG history2 6 <11 1 <1 0 2 4 2 3
CONTAMINATION Fuel Water Glycol WEAR METALS fron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm Sulfur ppm CONTAMINANTS	WC Method WC Method WC Method WC Method ASTM D5185m	>4.0 >.11 limit/base >15 >4 >6 >9 >6 >4	current <1.0 NEG NEG current 8 <1 0 <1 0 3 3 2 2 0 0	history1 <1.0 NEG NEG history1 6 <1 0 0 2 2 3 3 0	history2 <1.0 NEG NEG history2 6 <1 1 <1 0 2 4 2 3
Fuel Water Glycol WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Lead ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Choppem Cho	WC Method WC Method WC Method WC Method ASTM D5185m	>4.0 >.11 limit/base >15 >4 >6 >9 >6 >4	<1.0 NEG NEG Current 8 <1 0 <1 0 3 3 2 2 0 0	<1.0 NEG NEG NES history1 6 <1 0 0 2 2 2 3 3 0	<1.0 NEG NEG history2 6 <1 1 1 <1 0 2 4 2 3
Water Glycol WEAR METALS Fron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm	WC Method WC Method ASTM D5185m	>.11 limit/base >15 >4 >6 >9 >6 >9 >4	NEG NEG current 8 <1 0 <1 0 3 3 2 2 2 0 0	NEG NEG history1 6 <1 0 0 0 2 2 2 3 3	NEG NEG history2 6 <1 1 <1 0 2 4 2 3
WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Chosphorus ppm Calcium ppm	WC Method method ASTM D5185m	limit/base	NEG current 8 <1 0 <1 0 3 3 2 2 0 0	NEG history1 6 <1 0 0 0 2 2 3 3 0	NEG history2 6 <1 1 <1 0 2 4 2 3
WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS	Method ASTM D5185m	>15 >4 >6 >9 >6 >4	current 8 <1 0 <1 0 3 3 2 2 0 0	history1 6 <1 0 0 0 2 2 3 3 0	history2 6 <1 1 <1 0 2 4 2 3
control ppm Chromium ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Chosphorus ppm Sulfur ppm Sulfur ppm CONTAMINANTS	ASTM D5185m	>15 >4 >6 >9 >6 >4	8 <1 0 <1 0 3 3 3 2 2 2 0 0 0	6 <1 0 0 0 0 2 2 2 3 3 0 0	6 <1 1 1 <1 0 2 4 2 3
Chromium ppm Nickel ppm Fitanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Calcium ppm	ASTM D5185m	>6 >9 >6 >4	<1 0 <1 0 3 3 2 2 2 0	<1 0 0 0 0 2 2 2 3 3	<1 1 <1 0 2 4 2 3
Nickel ppm Fitanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Calcium ppm Contaminants	ASTM D5185m	>6 >9 >6 >4	0 <1 0 3 3 3 2 2 2 0 0 0	0 0 0 2 2 2 3 3	1 <1 0 2 4 2 3
Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm	ASTM D5185m	>9 >6 >4	<1 0 3 3 2 2 0 0	0 0 2 2 2 3 3	<1 0 2 4 2 3
Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm Sulfur ppm	ASTM D5185m	>9 >6 >4	0 3 3 2 2 0 0	0 2 2 3 3	0 2 4 2 3
Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>9 >6 >4	3 3 2 2 2 0 0	2 2 3 3	2 4 2 3
Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>9 >6 >4	3 2 2 0 0	2 3 3 0	4 2 3
Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>6 >4	2 2 0 0	3 3 0	2
Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS	ASTM D5185m ASTM D5185m ASTM D5185m	>4	2 0 0	3	3
Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS	ASTM D5185m ASTM D5185m		0 0	0	
ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS	ASTM D5185m	limit/base	0		<1
ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS		limit/base		0	
Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm		limit/base	ou uvv o rot	U	<1
Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS	method		current	history1	history2
Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS	ASTM D5185m		2	4	3
Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS	ASTM D5185m		0	1	0
Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS	ASTM D5185m		3	2	3
Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS	ASTM D5185m		<1	1	1
Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS	ASTM D5185m		12	14	10
Zinc ppm Sulfur ppm CONTAMINANTS	ASTM D5185m		1965	1984	1786
Sulfur ppm CONTAMINANTS	ASTM D5185m		278	286	288
CONTAMINANTS	ASTM D5185m		347	360	335
	ASTM D5185m		3705	3698	3317
Silicon ppm	method	limit/base	current	history1	history2
PP'''	ASTM D5185m	>181	▲ 205	▲ 187	153
Sodium ppm	ASTM D5185m	>21	2	2	0
Potassium ppm	ASTM D5185m	>20	0	0	3
INFRA-RED	method	limit/base	current	history1	history2
Soot % %			0.1	0.1	0.1
Nitration Abs/cr	*ASTM D7844		5.9	5.8	5.7
Sulfation Abs/.1mm			24.9	24.1	22.9
FLUID DEGRADATION	m *ASTM D7624				
Oxidation Abs/.1mi	m *ASTM D7624	limit/base	current	history1	history2
Acid Number (AN) mg KOH	m *ASTM D7624 m *ASTM D7415 method	limit/base			
Base Number (BN) mg KOH	m *ASTM D7624 m *ASTM D7415 method m *ASTM D7414	limit/base	current 16.0 2.26	history1 15.1 2.18	history2 14.3 ^ 2.04



OIL ANALYSIS REPORT







Certificate 12367

Sample No.

: WC0905701 Lab Number : 06161680 Unique Number : 10997103 Test Package : MOB 2

Received **Tested** Diagnosed

: 26 Apr 2024 : 29 Apr 2024 : 29 Apr 2024 - Sean Felton

Grand Blanc Powerstation, 2361 West Grand Blanc Road Grand Blanc, MI

US 48439 Contact: Tony Saint Marie tony.saintmarie@edlenergy.com

To discuss this sample report, contact Customer Service at 1-800-237-1369. st - 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)

Report Id: EDLGRA [WUSCAR] 06161680 (Generated: 05/01/2024 08:51:43) Rev: 1

Submitted By: DARREL HILTZ

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