

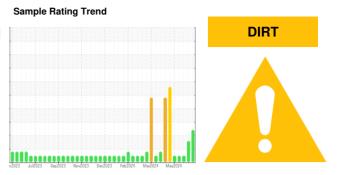
OIL ANALYSIS REPORT



Machine Id **Grand Blanc CAT 2 GBLM02BE**

Biogas Engine

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



DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor. (Customer Sample Comment: 900hr end of cycle sample)

Wear

The copper level is marginal. All other component wear rates are normal.

Contamination

Elemental level of silicon (Si) above normal indicating ingress of seal material.

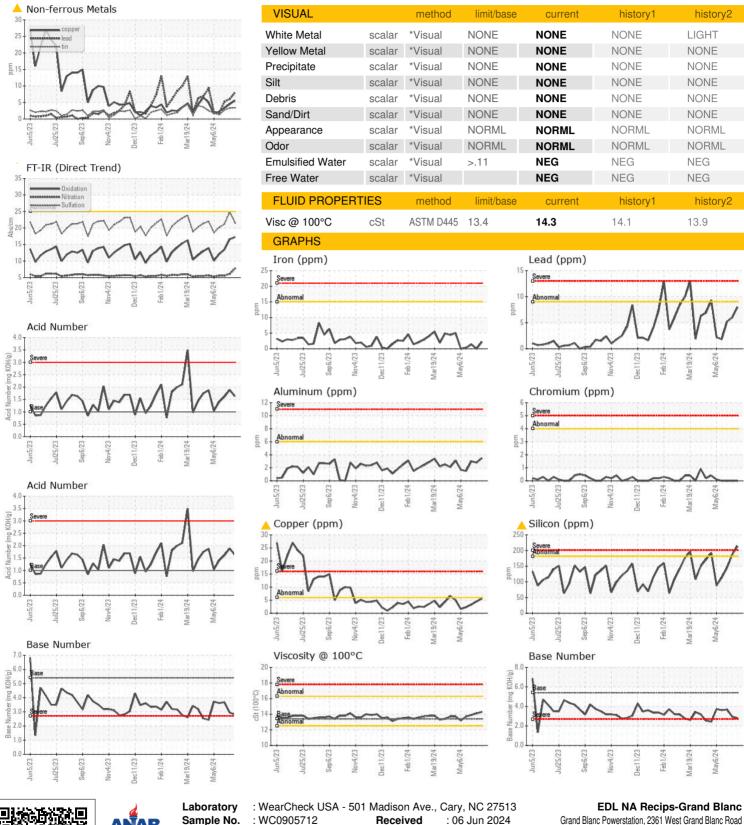
Fluid Condition

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 Number Client Info WC0905712 WC0905707 WC0905707 WC0905707 Sample Date Client Info 03 Jun 2024 29 May 2024 22 May 2 23 May 2 24 May 2							
Sample Date Client Info 03 Jun 2024 29 May 2024 22 May 2 24 May 2024 22 May 2 28 May 2024 22 May 2024 22 May 2024 22 May 2024 28 May 2024 29 May 204 29 May 2024 <th< th=""><th>SAMPLE INFORM</th><th>ATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></th<>	SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Machine Age Oil Age hrs hrs Client Info Client Info Sample Status 13481 13363 13177 Oil Age hrs Client Info Sample Status Not Changd ABNORMAL Not Changd ABNORMAL N/A CONTAMINATION method limit/base current history1 history1 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Water WC Method >.11 NEG NEG NEG Glycol WC Method 1.5 2 0 1 WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >15 2 0 1 Kickel ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m 0 0 0 0 Aluminum ppm ASTM D5185m >9 8 6 4 3 3 Copper ppm ASTM D5185m >4	Sample Number		Client Info		WC0905712	WC0905707	WC0905715
Oil Age hrs Client Info 925 805 0 Oil Changed Client Info Not Changd Not Changd N/A N/A Sample Status Contaktion Mode ABNORMAL ABNORMAL NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >4.0 <1.0	Sample Date		Client Info		03 Jun 2024	29 May 2024	22 May 2024
Oil Changed Sample Status Client Info Not Changd ABNORMAL Not Changd ABNORMAL N/A NORMAL NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >4.0 <1.0	Machine Age	hrs	Client Info		13481	13363	13177
Sample Status ABNORMAL ABNORMAL NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >4.0 <1.0	Oil Age	hrs	Client Info		925	805	0
CONTAMINATION method limit/base current history1 history1 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Water WC Method >.11 NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >15 2 0 1 Chromium ppm ASTM D5185m >4 0 0 0 Nickel ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m 0 0 0 0 Aluminum ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >9 8 6 5 Copper ppm ASTM D5185m <1 0 0 Caddium ppm <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>Not Changd</th> <th>Not Changd</th> <th>N/A</th>	Oil Changed		Client Info		Not Changd	Not Changd	N/A
Fuel WC Method >4.0 <1.0	Sample Status				ABNORMAL	ABNORMAL	NORMAL
Water WC Method >.11 NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history1 WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >15 2 0 1 Chromium ppm ASTM D5185m >4 0 0 0 0 Nickel ppm ASTM D5185m 0 0 0 0 0 Silver ppm ASTM D5185m 0 0 0 0 0 Aluminum ppm ASTM D5185m >6 4 3 3 3 Lead ppm ASTM D5185m >9 8 6 5 Copper ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <1	CONTAMINATION		method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 histor Iron ppm ASTM D5185m >15 2 0 1 Chromium ppm ASTM D5185m >4 0 0 0 Nickel ppm ASTM D5185m 0 0 0 0 Titanium ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m >6 4 3 3 Aluminum ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >6 4 3 3 Vanadium ppm ASTM D5185m <1	Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 histor Iron ppm ASTM D5185m >15 2 0 1 Chromium ppm ASTM D5185m >4 0 0 0 Nickel ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m 0 0 0 0 Aluminum ppm ASTM D5185m >6 4 3 3 Aluminum ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >6 4 3 3 Copper ppm ASTM D5185m >6 4 3 3 3 Vanadium ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m 46 53 39	Water		WC Method	>.11	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >4 0 0 0 Nickel ppm ASTM D5185m 0 0 0 0 Titanium ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m 0 0 0 0 Aluminum ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >6 4 3 3 Copper ppm ASTM D5185m >6 4 3 3 Vanadium ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 46 53 39 39 Barium ppm ASTM D5185m 46 53 39 39 Barium ppm ASTM D5185m 0 0 0 0	WEAR METALS		method	limit/base	current	history1	history2
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 4 3 3 Lead ppm ASTM D5185m >9 8 6 5 Copper ppm ASTM D5185m >9 8 6 4 3 Tin ppm ASTM D5185m >6 6 4 3 3 3 Vanadium ppm ASTM D5185m >4 3 3 3 3 Vanadium ppm ASTM D5185m 0 0 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Iron	ppm	ASTM D5185m	>15	2	0	1
Titanium ppm ASTM D5185m 0 0 0 Silver ppm ASTM D5185m 0 0 0 Aluminum ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >9 8 6 5 Copper ppm ASTM D5185m >6 4 3 3 Tin ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <1	Chromium	ppm	ASTM D5185m	>4	0	0	0
Silver ppm ASTM D5185m 0 0 0 Aluminum ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >9 8 6 5 Copper ppm ASTM D5185m >6 4 3 3 Tin ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <4 3 3 3 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m 46 53 39 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m 41 4 1 <1 Magnesium ppm ASTM D5185m 1998 1785 1836 Phosphorus ppm ASTM D51	Nickel	ppm	ASTM D5185m		0	0	0
Aluminum ppm ASTM D5185m >6 4 3 3 Lead ppm ASTM D5185m >9 8 6 5 Copper ppm ASTM D5185m >6 4 3 Tin ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 histo Boron ppm ASTM D5185m 46 53 39 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 1998 1785 1836 Phosphorus ppm ASTM D5185m <t< th=""><th>Titanium</th><th>ppm</th><th>ASTM D5185m</th><th></th><th>0</th><th>0</th><th>0</th></t<>	Titanium	ppm	ASTM D5185m		0	0	0
Lead ppm ASTM D5185m >9 8 6 5 Copper ppm ASTM D5185m >6 4 3 Tin ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <1	Silver	ppm	ASTM D5185m		0	0	0
Copper ppm ASTM D5185m >6 ▲ 6 4 3 Tin ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 histor Boron ppm ASTM D5185m 46 53 39 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m <1 <1 <1 <1 Magnesium ppm ASTM D5185m 1998 1785 1836 Phosphorus ppm ASTM D5185m 345 320 308 Zinc ppm ASTM D5185m 448 410 410 Sulfur ppm ASTM D5185m <th>Aluminum</th> <th>ppm</th> <th>ASTM D5185m</th> <th>>6</th> <th>4</th> <th>3</th> <th>3</th>	Aluminum	ppm	ASTM D5185m	>6	4	3	3
Tin ppm ASTM D5185m >4 3 3 3 Vanadium ppm ASTM D5185m <1	Lead	ppm	ASTM D5185m	>9	8	6	5
Vanadium ppm ASTM D5185m <1	Copper	ppm	ASTM D5185m	>6	<u>^</u> 6	4	3
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 histor Boron ppm ASTM D5185m 46 53 39 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 133 18 17 Calcium ppm ASTM D5185m 1998 1785 1836 Phosphorus ppm ASTM D5185m 345 320 308 Zinc ppm ASTM D5185m 448 410 410 Sulfur ppm ASTM D5185m 4533 3907 4090 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >181 214	Tin	ppm	ASTM D5185m	>4	3	3	3
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 46 53 39 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 46 53 39 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 13 18 17 Calcium ppm ASTM D5185m 1998 1785 1836 Phosphorus ppm ASTM D5185m 345 320 308 Zinc ppm ASTM D5185m 448 410 410 Sulfur ppm ASTM D5185m 4533 3907 4090 CONTAMINANTS method limit/base current history1 histo Silicon ppm ASTM D5185m >181 142 145 145	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 4 3 3 Manganese ppm ASTM D5185m <1	Boron	ppm	ASTM D5185m		46	53	39
Manganese ppm ASTM D5185m <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 13 18 17 Calcium ppm ASTM D5185m 1998 1785 1836 Phosphorus ppm ASTM D5185m 345 320 308 Zinc ppm ASTM D5185m 448 410 410 Sulfur ppm ASTM D5185m 4533 3907 4090 CONTAMINANTS method limit/base current history1 histo Silicon ppm ASTM D5185m >181 214 187 145	Molybdenum	ppm	ASTM D5185m		4	3	3
Calcium ppm ASTM D5185m 1998 1785 1836 Phosphorus ppm ASTM D5185m 345 320 308 Zinc ppm ASTM D5185m 448 410 410 Sulfur ppm ASTM D5185m 4533 3907 4090 CONTAMINANTS method limit/base current history1 histo Silicon ppm ASTM D5185m >181 214 187 145	•	ppm	ASTM D5185m		<1	<1	<1
Phosphorus ppm ASTM D5185m 345 320 308 Zinc ppm ASTM D5185m 448 410 410 Sulfur ppm ASTM D5185m 4533 3907 4090 CONTAMINANTS method limit/base current history1 histo Silicon ppm ASTM D5185m >181 214 187 145	Magnesium	ppm	ASTM D5185m		13	18	17
Zinc ppm ASTM D5185m 448 410 410 Sulfur ppm ASTM D5185m 4533 3907 4090 CONTAMINANTS method limit/base current history1 histo Silicon ppm ASTM D5185m >181 214 187 145	Calcium	ppm	ASTM D5185m		1998	1785	1836
Sulfur ppm ASTM D5185m 4533 3907 4090 CONTAMINANTS method limit/base current history1 histo Silicon ppm ASTM D5185m >181 ▲ 214 ▲ 187 145		ppm	ASTM D5185m		345	320	
CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >181 ▲ 214 ▲ 187 145		ppm	ASTM D5185m		448	410	410
Silicon ppm ASTM D5185m >181 ▲ 214 ▲ 187 145	Sulfur	ppm	ASTM D5185m		4533	3907	4090
	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m >21 2 <1	Silicon	ppm	ASTM D5185m	>181	<u> </u>		145
	Sodium	ppm	ASTM D5185m	>21	2	<1	1
Potassium ppm ASTM D5185m >20 <1	Potassium	ppm	ASTM D5185m	>20	<1	0	<1
INFRA-RED method limit/base current history1 history	INFRA-RED		method	limit/base	current	history1	history2
Soot %	Soot %	%	*ASTM D7844		0.1	0.1	0.1
Nitration Abs/cm *ASTM D7624 7.7 6.1 5.6	Nitration	Abs/cm	*ASTM D7624		7.7	6.1	5.6
Sulfation Abs/.1mm *ASTM D7415 21.7 24.9 21.2	Sulfation	Abs/.1mm	*ASTM D7415		21.7	24.9	21.2
FLUID DEGRADATION method limit/base current history1 histo	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414		17.2	16.6	13.5
Oxidation Abs/.1mm *ASTM D7414 17.2 16.6 13.5							
Oxidation Abs/.1mm *ASTM D7414 17.2 16.6 13.5 Acid Number (AN) mg KOH/g ASTM D8045 1.0 1.63 1.89 1.61	Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	1.63	1.89	1.61



OIL ANALYSIS REPORT







Certificate 12367

Sample No. Lab Number : 06201629

Unique Number : 11063752 Test Package : MOB 2

: WC0905712 Received **Tested** : 07 Jun 2024

Diagnosed : 10 Jun 2024 - Doug Bogart

Grand Blanc Powerstation, 2361 West Grand Blanc Road Grand Blanc, MI US 48439

> Contact: Tony Saint Marie tony.saintmarie@edlenergy.com T:

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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