

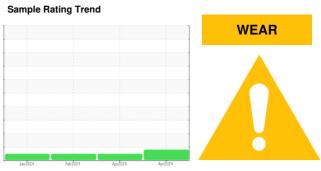
OIL ANALYSIS REPORT



Machine Id **Byron Center CAT 3 BYCM03BE**

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.

The tin level is abnormal. All other component wear rates are normal.

Contamination

There is no indication of any contamination in the

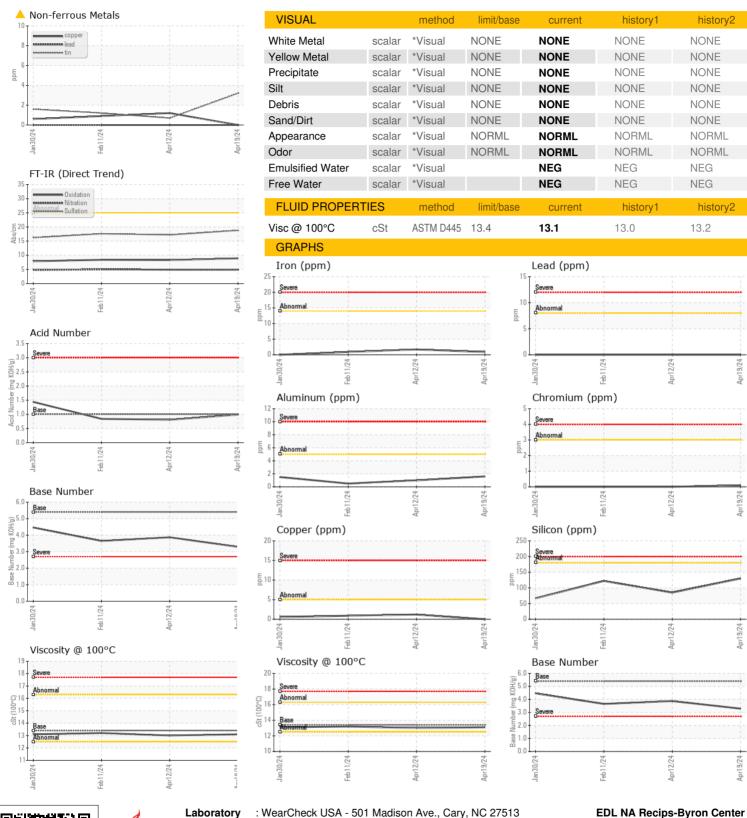
Fluid Condition

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.

Sample Number Client Info WC0877018 WC0877016 WC0877016 Sample Date Client Info 19 Apr 2024 12 Apr 2024 11 Feb 2024 Machine Age hrs Client Info 67202 67039 68804 Oil Age hrs Client Info 400 235 469 Oil Changed Client Info 400 235 469 Oil Changed Client Info NVA N/A N/A Sample Status ABNORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method NEG NEG NEG NEG Mater WC Method NEG NEG NEG NEG Micon ppm ASTM D5185m >14 <1 2 <1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <th>ENGINE OIL 40 (-</th> <th> GAL)</th> <th>Jan202</th> <th>4 1602024</th> <th>Apr2U24 A</th> <th>pr2024</th> <th></th>	ENGINE OIL 40 (-	GAL)	Jan202	4 1602024	Apr2U24 A	pr2024	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 67202 67039 66804 Dil Age hrs Client Info 400 235 469 Dil Changed Client Info N/A N/A N/A Sample Status MC Method ABNORMAL NCRMAL NCRMAL CONTAMINATION method Imitibase current history1 history2 Fuel WC Method NEG NEG NEG NEG Water WC Method NEG NEG NEG NEG Med NEG NEG NEG NEG NEG NEG Med Total MC Method NEG	Sample Number		Client Info		WC0877018	WC0877016	WC0877006
Dil Age	Sample Date		Client Info		19 Apr 2024	12 Apr 2024	11 Feb 2024
Dil Changed Client Info N/A	Machine Age	hrs	Client Info		67202	67039	66804
ABNORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 history2 value WC Method NEG NE	Oil Age	hrs	Client Info		400	235	469
ABNORMAL NORMAL NORMAL NORMAL	Oil Changed		Client Info		N/A	N/A	N/A
Wilson	-				ABNORMAL	NORMAL	NORMAL
Water WC Method NEG Nex NEG NEG <t< td=""><td>CONTAMINATION</td><td>١</td><td>method</td><td>limit/base</td><td>current</td><td>history1</td><td>history2</td></t<>	CONTAMINATION	١	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >14 <1	Water		WC Method		NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >3 <1 0 0 Nickel ppm ASTM D5185m 0 0 0 Titanium ppm ASTM D5185m 0 0 0 Siliver ppm ASTM D5185m 5 2 1 <1 Lead ppm ASTM D5185m >5 2 1 <1 Lead ppm ASTM D5185m >5 0 0 0 Copper ppm ASTM D5185m >5 0 1 <1 Tin ppm ASTM D5185m >3 3 <1 1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 1 Boron ppm ASTM D5185m 3 2 0 Barium ppm ASTM D5185m 0 0 0 Barium ppm ASTM D5185m 1 2 </td <td>WEAR METALS</td> <td></td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>	WEAR METALS		method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>14	<1	2	<1
Description	Chromium	ppm	ASTM D5185m	>3	<1	0	0
Description	Nickel		ASTM D5185m		0	0	0
Silver	Titanium	• •	ASTM D5185m		0	0	0
Aluminum						0	0
Lead ppm ASTM D5185m >8 0 0 0 Copper ppm ASTM D5185m >5 0 1 <1 Tin ppm ASTM D5185m >3 ▲ 3 <1 1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 1 2 <1 0 Magnesium ppm ASTM D5185m 29 23 6 Calcium ppm ASTM D5185m 29 23 6 Zinc ppm ASTM D5185m 320 263 320 Zinc ppm ASTM D5185m	Aluminum			>5		1	<1
Copper ppm ASTM D5185m >5 0 1 <1 Tin ppm ASTM D5185m >3 ▲ 3 <1							
Tin		• •					
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 3 2 0 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 1 2 <1 Manganese ppm ASTM D5185m 21 <1 0 Magnesium ppm ASTM D5185m 29 23 6 Calcium ppm ASTM D5185m 278 241 261 Phosphorus ppm ASTM D5185m 3021 2237 2341 Zinc ppm ASTM D5185m 3021 2237 2341 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 2					-		
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 3 2 0 Barium ppm ASTM D5185m 0 0 0 Wolybdenum ppm ASTM D5185m 1 2 <1				70			
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Boron		рріп		11 11 11			
Barium				ilmit/base			_
Molybdenum ppm ASTM D5185m 1 2 <1 Manganese ppm ASTM D5185m 29 23 6 Calcium ppm ASTM D5185m 29 23 6 Calcium ppm ASTM D5185m 1660 1590 1816 Phosphorus ppm ASTM D5185m 278 241 261 Zinc ppm ASTM D5185m 320 263 320 Sulfur ppm ASTM D5185m 3021 2237 2341 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >180 130 85 122 Sodium ppm ASTM D5185m >20 2 2 2 Potassium ppm ASTM D5185m >20 3 <1		• •					
Manganese ppm ASTM D5185m <1 <1 0 Magnesium ppm ASTM D5185m 29 23 6 Calcium ppm ASTM D5185m 1660 1590 1816 Phosphorus ppm ASTM D5185m 278 241 261 Zinc ppm ASTM D5185m 320 263 320 Sulfur ppm ASTM D5185m 3021 2237 2341 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >180 130 85 122 Sodium ppm ASTM D5185m >20 2 2 <1 Potassium ppm ASTM D5185m >20 3 <1 <1 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624 4.9 4.9 5.0 Sulfation Abs/.1mm *ASTM D7415 </td <td></td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td>0</td> <td></td> <td></td>		ppm	ASTM D5185m		0		
Magnesium ppm ASTM D5185m 29 23 6 Calcium ppm ASTM D5185m 1660 1590 1816 Phosphorus ppm ASTM D5185m 278 241 261 Zinc ppm ASTM D5185m 320 263 320 Sulfur ppm ASTM D5185m 3021 2237 2341 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >180 130 85 122 Solium ppm ASTM D5185m >20 2 2 <1	Molybdenum	ppm			1		
Calcium ppm ASTM D5185m 1660 1590 1816 Phosphorus ppm ASTM D5185m 278 241 261 Zinc ppm ASTM D5185m 320 263 320 Sulfur ppm ASTM D5185m 3021 2237 2341 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >180 130 85 122 Sodium ppm ASTM D5185m >20 2 2 <1	Manganese	ppm	ASTM D5185m		<1	<1	0
Phosphorus ppm ASTM D5185m 278 241 261 Zinc ppm ASTM D5185m 320 263 320 Sulfur ppm ASTM D5185m 3021 2237 2341 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >180 130 85 122 Sodium ppm ASTM D5185m >20 2 2 <1	Magnesium	ppm	ASTM D5185m		29	23	6
Solifur ppm ASTM D5185m 320 263 320 2341	Calcium	ppm	ASTM D5185m		1660	1590	1816
Sulfur ppm ASTM D5185m 3021 2237 2341 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >180 130 85 122 Sodium ppm ASTM D5185m >20 2 2 <1	Phosphorus	ppm	ASTM D5185m		278	241	261
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >180 130 85 122 Sodium ppm ASTM D5185m >20 2 2 <1	Zinc	ppm	ASTM D5185m		320	263	320
Silicon ppm ASTM D5185m >180 130 85 122 Sodium ppm ASTM D5185m >20 2 2 <1 Potassium ppm ASTM D5185m >20 3 <1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 4.9 4.9 5.0 Sulfation Abs/.1mm *ASTM D7415 18.8 17.2 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 8.9 8.3 8.4 Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84	Sulfur	ppm	ASTM D5185m		3021	2237	2341
Sodium ppm ASTM D5185m >20 2 2 <1 Potassium ppm ASTM D5185m >20 3 <1	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 3 <1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 4.9 4.9 5.0 Sulfation Abs/.1mm *ASTM D7415 18.8 17.2 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 8.9 8.3 8.4 Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84	Silicon	ppm	ASTM D5185m	>180	130	85	122
INFRA-RED	Sodium	ppm	ASTM D5185m	>20	2	2	<1
Soot % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 4.9 4.9 5.0 Sulfation Abs/.1mm *ASTM D7415 18.8 17.2 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 8.9 8.3 8.4 Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84	Potassium	ppm	ASTM D5185m	>20	3	<1	<1
Nitration Abs/cm *ASTM D7624 4.9 4.9 5.0 Sulfation Abs/.1mm *ASTM D7415 18.8 17.2 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 8.9 8.3 8.4 Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 4.9 4.9 5.0 Sulfation Abs/.1mm *ASTM D7615 18.8 17.2 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 8.9 8.3 8.4 Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84	Soot %	%	*ASTM D7844		0	0	0
Sulfation Abs/.1mm *ASTM D7415 18.8 17.2 17.6 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm *ASTM D7414 8.9 8.3 8.4 Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84		Abs/cm					
Oxidation Abs/.1mm *ASTM D7414 8.9 8.3 8.4 Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84							
Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.99 0.808 0.84	Oxidation	Abs/.1mm	*ASTM D7414		8.9	8.3	8.4
				4.0			
	ACIO NUITIDEI TAINI	IIIQ NUH/II	ASTM D8045	1.0	0.99	0.808	0.84



OIL ANALYSIS REPORT







Certificate 12367

Laboratory Sample No. Lab Number

: WC0877018 : 06157835

Unique Number : 10993258 Test Package : MOB 2

Received : 23 Apr 2024 **Tested** : 24 Apr 2024 Diagnosed : 25 Apr 2024 - Don Baldridge

Byron Center Powerstation, 10310 South Kent Road Byron Center, MI

US 49315 Contact: Jake Ripke Jake.Ripke@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: EDLBYR [WUSCAR] 06157835 (Generated: 04/25/2024 16:47:31) Rev: 1

Submitted By: STEWART WESLEY

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