

OIL ANALYSIS REPORT

.....

Sample Rating Trend



Coopersville CAT 3 CPVM03BE

Biogas Engine

CHEVRON HDAX 6500 LFG GAS ENGINE OIL (--- GAL)

Sample Number Client Info WC0819425 WC0819425 WC0819421 WC0819421 WC0819425 Sample Date ns Client Info 2015 20000 19654 Oil Age hrs Client Info 215 1 764 Oil Changed Client Info Not Changd Changed Not Change Sample Status Client Info Not Change Not Change Not Change Not Change CONTAMINATION method limit/base current history1 history1 Fuel WC Method >.0 REG NEG NEG Glycol WC Method SIM Sim Stiff 4 -1 0 -7 Iron ppm ASTM D5185m >15 1 0 -7 -7 Iranium ppm ASTM D5185m >6 0 0 0 0 Iranium ppm ASTM D5185m >6 0 0 0 0 Iranium ppm <	GAS ENGINE OIL (-	UAL)	t2022 Nov20	22 Jan2023 Mar2023	Apr2023 Jun2023 Aug2023	0ct2023	
Sample Date Client Info 16 Nov 2023 07 Nov 2023 23 Oct 202 Machine Age hrs Client Info 20215 20000 19654 Oil Age hrs Client Info 215 1 764 Oil Changed Client Info Not Changg Not Changg Not Changg Sample Status Client Info Not Changg Not Changg Not Changg Glycol WC Method >4.0 <1.0 <1.0 <1.0 Water WC Method >0.1 NEG NEG NEG WCARTALS method imit/base current history1 history1 Vater WC Method >0.1 NEG NEG NEG Wickel ppm ASTM 05185m >2 <1 0 0 Tranum ppm ASTM 05185m >2 <1 0 0 Chromium ppm ASTM 05185m >4 3 <1 7 Silver ppm ASTM 05185m <th>SAMPLE INFORM</th> <th>IATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 20215 20000 19654 Oil Age hrs Client Info 215 1 764 Oil Changed Client Info Not Changed Not Changed Not Changed Sample Status Imit/base current NoRMAL NORMAL ABNORMA CONTAMINATION method Imit/base current Nistory Nistory Fuel WC Method >4.0 <1.0	Sample Number		Client Info		WC0819425	WC0819421	WC0819484
Oil Age hrs Client Info 215 1 764 Oil Changed Client Info Not Changd Not Changd Not Changed Sample Status ConTAMINATION method limit/base current history1 history1 Fuel WC Method >4.0 <1.0	Sample Date		Client Info		16 Nov 2023	07 Nov 2023	23 Oct 2023
Oil Changed Sample Status Client Info Not Changed NORMAL Not Changed NORMAL Not Changed ABNORMAL Water WC Method >0.1 NEG NEG NEG NEG Water WC Method >0.1 NEG NEG NEG NEG WEAR METALS method Imit/base current history1 history1 Iron ppm ASTM D5185m >0 0 0 0 Silver ppm ASTM D5185m <1	Machine Age	hrs	Client Info		20215	20000	19654
Oil Changed Client Info Not Change NORMAL Changed NORMAL Not Change ABNORMAL CONTAMINATION method limit/base current history history Fuel WC Method >0.0 <1.0 <1.0 <1.0 <1.0 Glycol WC Method >0.1 NEG NEG NEG WC Method >0.1 NEG Neg Neg Neg WC Method >0.1 NEG Neg Neg Neg WC Method >0.1 NEG Not Change Neg WC Method >0.1 NEG Neg Neg Nickel ppm ASTM D5185m >1 0 7 Chromium ppm ASTM D5185m >0 0 0 Silver ppm ASTM D5185m >4 3 <1 1 Lead ppm ASTM D5185m >4 3 <1 0 Copper ppm ASTM D5185m 14 <1	Oil Age	hrs	Client Info		215	1	764
Sample Status NORMAL NORMAL NORMAL ABNORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >4.0 <1.0	-		Client Info			Changed	Not Changd
Fuel WC Method >4.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	Sample Status				•	U	ABNORMAL
Water WC Method >0.1 NEG NEG NEG NEG Glycol WC Method Imil/base current history1 history1 Iron ppm ASTM D5185m >15 1 0 7 Chromium ppm ASTM D5185m >2 <1	CONTAMINATION	۱.	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >15 1 0 <1	Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >15 1 0 7 Chromium ppm ASTM D5185m >4 <1	Water		WC Method	>0.1	NEG	NEG	NEG
Iron ppm ASTM D5185m >15 1 0 7 Chromium ppm ASTM D5185m >4 <1	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >4 <1 0 <1 Nickel ppm ASTM D5185m >2 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 <1 0 0 Titanium ppm ASTM D5185m >5 0 0 0 Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >6 1 <1	Iron	ppm	ASTM D5185m	>15	1	0	7
Titanium ppm ASTM D5185m 0 0 0 Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >6 1 <1	Chromium	ppm	ASTM D5185m	>4	<1	0	<1
Titanium ppm ASTM D5185m 0 0 0 Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >6 1 <1	Nickel		ASTM D5185m	>2	<1	0	0
Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >6 1 <1	Titanium		ASTM D5185m		0	0	0
Aluminum ppm ASTM D5185m >6 1 <1 1 Lead ppm ASTM D5185m >9 0 0 1 Copper ppm ASTM D5185m >14 <1				>5			
Lead ppm ASTM D5185m >9 0 0 1 Copper ppm ASTM D5185m >14 <1							
Copper ppm ASTM D5185m >14 <1 <1 3 Tin ppm ASTM D5185m >4 3 <1							
Tin ppm ASTM D5185m >4 3 <1 7 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m <1					-		
Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m <1 0 0 Barium ppm ASTM D5185m 0 0 1 Maganese ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m <11 <1 <1 Calcium ppm ASTM D5185m 7 12 1 Calcium ppm ASTM D5185m 7 12 1 Phosphorus ppm ASTM D5185m 260 244 237 Zinc ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m 2181 8							
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history Boron ppm ASTM D5185m <1 0 0 Boron ppm ASTM D5185m 0 2 0 Molybdenum ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m 7 12 1 Calcium ppm ASTM D5185m 76 260 244 237 Zinc ppm ASTM D5185m 260 244 237 Zinc ppm ASTM D5185m 317 313 340 Sulfur ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >181 85 <t< td=""><td></td><td></td><td></td><td>24</td><th></th><td></td><td></td></t<>				24			
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m <1							
Boron ppm ASTM D5185m <1 0 0 Barium ppm ASTM D5185m 0 2 0 Molybdenum ppm ASTM D5185m 0 0 1 Magnese ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m <1		ррш		1	-		-
Barium ppm ASTM D5185m 0 2 0 Molybdenum ppm ASTM D5185m 0 0 1 Manganese ppm ASTM D5185m - 1 <1				limit/base			
Molybdenum ppm ASTM D5185m 0 0 1 Manganese ppm ASTM D5185m <1	Boron	ppm	ASTM D5185m				
Manganese ppm ASTM D5185m <1 <1 <1 <1 Magnesium ppm ASTM D5185m 7 12 1 Calcium ppm ASTM D5185m 7 12 1 Calcium ppm ASTM D5185m 1641 1381 1710 Phosphorus ppm ASTM D5185m 260 244 237 Zinc ppm ASTM D5185m 317 313 340 Sulfur ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >20 0 <1	Barium	ppm	ASTM D5185m		0	2	0
Magnesium ppm ASTM D5185m 7 12 1 Calcium ppm ASTM D5185m 1641 1381 1710 Phosphorus ppm ASTM D5185m 260 244 237 Zinc ppm ASTM D5185m 260 244 237 Zinc ppm ASTM D5185m 317 313 340 Sulfur ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >20 0 <1	Molybdenum	ppm	ASTM D5185m		0	0	1
Calcium ppm ASTM D5185m 1641 1381 1710 Phosphorus ppm ASTM D5185m 260 244 237 Zinc ppm ASTM D5185m 317 313 340 Sulfur ppm ASTM D5185m 317 313 340 Sulfur ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >20 0 <1	Manganese	ppm	ASTM D5185m		<1	<1	<1
Phosphorus ppm ASTM D5185m 260 244 237 Zinc ppm ASTM D5185m 317 313 340 Sulfur ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >20 0 <1	Magnesium	ppm	ASTM D5185m		7	12	1
Zinc ppm ASTM D5185m 317 313 340 Sulfur ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >20 0 <1	Calcium	ppm	ASTM D5185m		1641	1381	1710
Sulfur ppm ASTM D5185m 1750 1532 1886 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >20 0 <11 1 INFRA-RED method limit/base current history1 history Soot % % *ASTM D7844 0.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 6.0 4.5 6.9 Sulfation Abs/.1mm *ASTM D7624 >20 6.0 4.5 6.9 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 10.6 8.0 15.7 Acid Number (AN) mg KOHg ASTM D8045 1.2<	Phosphorus	ppm	ASTM D5185m		260	244	237
CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m >0 0 2 Potassium ppm ASTM D5185m >20 0 <1	Zinc	ppm	ASTM D5185m		317	313	340
Silicon ppm ASTM D5185m >181 85 22 ▲ 189 Sodium ppm ASTM D5185m 0 0 2 Potassium ppm ASTM D5185m >20 0 <1	Sulfur	ppm	ASTM D5185m		1750	1532	1886
Sodium ppm ASTM D5185m 0 0 2 Potassium ppm ASTM D5185m >20 0 <1	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 0 0 2 Potassium ppm ASTM D5185m >20 0 <1	Silicon	ppm	ASTM D5185m	>181	85	22	1 89
Potassium ppm ASTM D5185m >20 0 <1 1 INFRA-RED method limit/base current history1 history Soot % % *ASTM D7844 0.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 6.0 4.5 6.9 Sulfation Abs/.1mm *ASTM D7415 >30 16.7 14.9 19.6 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 10.6 8.0 15.7 Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	Sodium		ASTM D5185m		0	0	2
Soot % % *ASTM D7844 0.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 6.0 4.5 6.9 Sulfation Abs/.1mm *ASTM D7415 >30 16.7 14.9 19.6 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 10.6 8.0 15.7 Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	Potassium	ppm		>20		<1	1
Nitration Abs/cm *ASTM D7624 >20 6.0 4.5 6.9 Sulfation Abs/.1mm *ASTM D7624 >30 16.7 14.9 19.6 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 10.6 8.0 15.7 Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 16.7 14.9 19.6 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 10.6 8.0 15.7 Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	Soot %	%	*ASTM D7844		0.1	0	0.1
Sulfation Abs/.1mm *ASTM D7415 >30 16.7 14.9 19.6 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 10.6 8.0 15.7 Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	Nitration	Abs/cm	*ASTM D7624	>20	6.0	4.5	6.9
Oxidation Abs/.1mm *ASTM D7414 >25 10.6 8.0 15.7 Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	Sulfation						
Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Acid Number (AN) mg KOH/g ASTM D8045 1.2 0.64 0.76 1.37	Oxidation	Abs/.1mm	*ASTM D7414	>25	10.6	8.0	15.7
	Base Number (BN)	mg KOH/g	ASTM D2896	4.5	5.50	4.97	3.72

Recommendation

Resample at the next service interval to monitor.

Machine Id

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

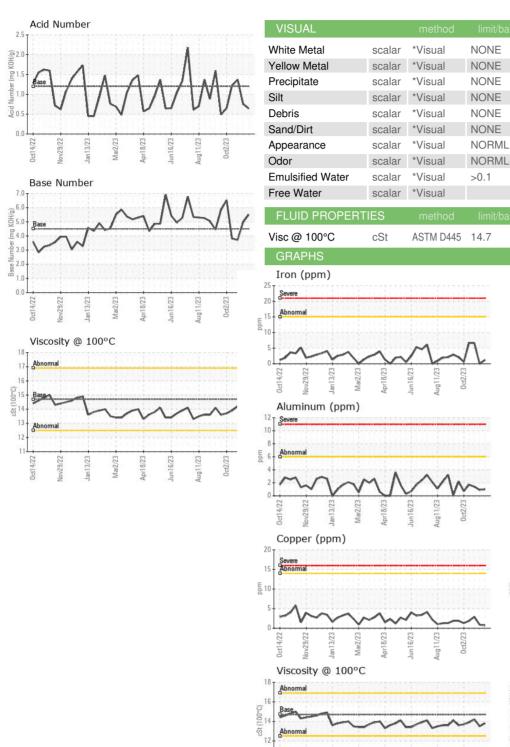
Fluid Condition

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.

Submitted By: Chad Conroy



OIL ANALYSIS REPORT



10

Laboratory

Sample No.

Lab Number

Unique Number

Test Package

Oct14/22 Nov29/22

: WC0819425

:06015276

: 10754420

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.

: MOB 2

Jan 13/23

Mar2/73

pr18/73

Received

Diagnosed

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

Diagnostician

Aug11/23

0ct2/23

: 22 Nov 2023

: 26 Nov 2023

: Don Baldridge

0ct14/22

Vov29/22

Jan 13/23 Mar2/73

Lead (ppm) bpm 0ct14/22 /ug11/23 Aar7.7 Chromium (ppm) Seven mdd 3 Aug11/23 0ct14/22 an 13/7 or18/2: Silicon (ppm) 250 200 150 100 50

NONE

NONE

NONE

NONE

NONE

NONE

NORML

NORML

NEG

NEG

14.2

NONE

NONE

NONE

NONE

NONE

NONE

NORML

NORML

NEG

NEG

13.8

NONE

NONE

NONE

NONE

NONE

NONE

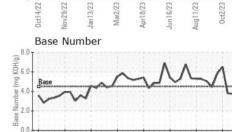
NORML

NORML

NEG

NEG

13.5



EDL NA Recips-Coopersville Coopersville Powerstation, 15362 68th Avenue Coopersville, MI US 49404 Contact: Daniel Young daniel.young@edlenergy.com T: F: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Apr18/23

Certificate L2367

Aug11/23 .

lun16/23