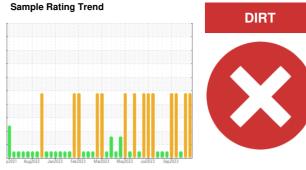


## **OIL ANALYSIS REPORT**



Machine Id **SAVM01BE (S/N GZJ00645)** Component **Biogas Engine** 

Fluid CHEVRON HDAX 6500 LFG GAS ENGINE OIL (14

	41 GAL)	p2021 Aug20		Mar2023 May2023 Jul2023	Sep2023	
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0788881	WC0788928	WC078892
a Sample Date		Client Info		30 Oct 2023	23 Oct 2023	16 Oct 2023
Machine Age	hrs	Client Info		1112472	1112377	1112212
Oil Age	hrs	Client Info		401	308	142
Oil Changed		Client Info		Not Changd	Not Changd	Not Change
Sample Status				SEVERE	SEVERE	NORMAL
CONTAMINATIO	N	method	limit/base	current	history1	history
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history
Iron	ppm	ASTM D5185m	>15	5	<1	2
Chromium	ppm	ASTM D5185m	>4	<1	0	0
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>6	3	1	2
Lead	ppm	ASTM D5185m	>9	2	<1	<1
Copper Tin Vanadium Cadmium ADDITIVES Boron	ppm	ASTM D5185m	>6	3	1	2
	ppm	ASTM D5185m	>4	4	2	2
	ppm	ASTM D5185m		<1	0	0
	ppm	ASTM D5185m		<1	0	0
		method	limit/base	current	history1	history
Богоп	ppm	ASTM D5185m		9	10	9
Barium	ppm ppm	ASTM D5185m ASTM D5185m		9 <1	10 0	9
		ASTM D5185m ASTM D5185m		<1 18		0 15
Barium Molybdenum Manganese	ppm	ASTM D5185m		<1 18 0	0 16 0	0 15 <1
Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 18	0 16 0 10	0 15 <1 10
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		<1 18 0 12 1866	0 16 0 10 1773	0 15 <1
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 18 0 12 1866 282	0 16 0 10 1773 276	0 15 <1 10 1785 271
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 18 0 12 1866 282 357	0 16 0 10 1773	0 15 <1 10 1785
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 18 0 12 1866 282	0 16 0 10 1773 276	0 15 <1 10 1785 271
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	<1 18 0 12 1866 282 357 2293	0 16 0 10 1773 276 319	0 15 <1 10 1785 271 321 1674
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 18 0 12 1866 282 357 2293	0 16 0 10 1773 276 319 1549	0 15 <1 10 1785 271 321 1674
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 18 0 12 1866 282 357 2293 current	0 16 0 10 1773 276 319 1549 history1	0 15 <1 10 1785 271 321 1674 history
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	>181	<1 18 0 12 1866 282 357 2293 current 259	0 16 0 10 1773 276 319 1549 history1 ◆ 213	0 15 <1 10 1785 271 321 1674 history 135
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m ASTM D5185m	>181	<1 18 0 12 1866 282 357 2293 current 259 <1 7	0 16 0 10 1773 276 319 1549 history1 213 0	0 15 <1 10 1785 271 321 1674 history 135 <1 4
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	>181 >20	<1 18 0 12 1866 282 357 2293 current 259 <1 7	0 16 0 10 1773 276 319 1549 history1 213 0 2	0 15 <1 10 1785 271 321 1674 history 135 <1 4
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	>181 >20 limit/base	<1 18 0 12 1866 282 357 2293 Current 259 <1 7 Current	0 16 0 10 1773 276 319 1549 history1 213 0 2 history1	0 15 <1 10 1785 271 321 1674 history 135 <1 4 history
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	>181 >20 limit/base >20	<1 18 0 12 1866 282 357 2293 Current 259 <11 7 Current 0	0 16 0 10 1773 276 319 1549 ► 213 0 2 13 0 2 ► 213 0 2 ► 213 0 0 2 ► 213 0 0 2 ► 213 0 0 2 ► 213 0 0 0 0 0 0 0 0 0 0 0 0 0	0 15 <1 10 1785 271 321 1674 history 135 <1 4 history 0
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m *ASTM D7844	>181 >20 limit/base >20	<1 18 0 12 1866 282 357 2293  Current  259 <1 7 Current 0 7.0 19.4	0 16 0 10 1773 276 319 1549 ► 213 0 2 ► 213 0 5 ► 213 0 ► 213 ► 213 0 5 ► 213 0 ► 213 0 ► 213 0 ► 213 ► 213 0 ► 215 ► 215 ► 215 ► 215 • 215 ► 215 • 215 • 21	0 15 <1 10 1785 271 321 1674 history 135 <1 4 history 0 6.2 17.0
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	>181 >20 limit/base >20 >30 limit/base	<1 18 0 12 1866 282 357 2293  Current  259 <1 7 Current 0 7.0 19.4	0 16 0 10 1773 276 319 1549 bistory1 € 213 0 2 bistory1 0 6.7 18.5	0 15 <1 10 1785 271 321 1674 history 135 <1 4 history 0 6.2 17.0
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	>181 >20 limit/base >20 >30 limit/base >25	<1 18 0 12 1866 282 357 2293  current 259 <1 7  current 0 7.0 19.4  current	0 16 0 10 1773 276 319 1549 ► 213 0 2 ► 213 0 2 ► 13 0 2 ► 13 0 2 ► 13 0 2 ► 13 0 2 ► 13 0 2 ► 13 0 2 ► 13 • 10 • 1549 ► 13 • 1549 ► 1540 ► 15400 ► 15400 ► 15400 ► 15400	0 15 <1 10 1785 271 321 1674 history: 135 <1 4 history: 0 6.2 17.0 history:

### DIAGNOSIS

### Recommendation

We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

### Wear

All component wear rates are normal.

#### Contamination

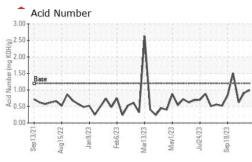
Elemental level of silicon (Si) above normal.

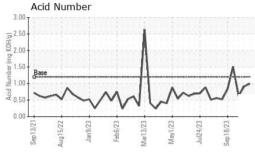
#### Fluid Condition

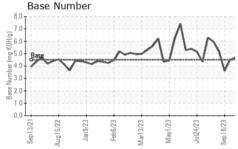
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid.

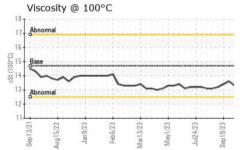


# **OIL ANALYSIS REPORT**









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	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
A	Silt	scalar *Visual	NONE	NONE	NONE	NONE
NV	Debris	scalar *Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar *Visual	NONE	NONE	NONE	NONE
/23 -	Appearance	scalar *Visual	NORML	NORML	NORML	NORML
Jul24/23 Sep18/23	Odor	scalar *Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar *Visual	>0.1	NEG	NEG	NEG
	Free Water	scalar *Visual	>0.1	NEG	NEG	NEG
	FLUID PROPERT	IES method	limit/base	current	history1	history2
	Visc @ 100°C	cSt ASTM D445	14.7	13.5	13.4	13.3
Ar	GRAPHS					
~~~	Iron (ppm)		15	Lead (ppm)		
23	20 Severe			Severe		
Jul24/23 Sep18/23		anteretreedeer	10	Abnormal	ndered render	
- 0	E 15 10		L L L L L L L L L L L L L L L L L L L			
	5	1	Λ, <sup>5</sup>			٨
٨		wir	V o	1		mar
$\Lambda$	Sep 13/21 Aug 15/22 . Jan 9/23 . Feb 6/23 .	Mar13/23 May1/23 Jui24/23	560   0/23	Sep13/21 Aug15/22 Jan9/23	Feb 6/23 Mar1 3/23 May1/23	Jul24/23 Sep18/23
VI	Sep Aug Ja	Mar Ma	Sep 2	Sep Aug Ja	Fe Mar Ma	Sep
<b>V</b>	Aluminum (ppm)			Chromium (pp	om)	
	12 10		5	Paura		
	8		4	Abnormal		
	E 6- Abnormal		Ed 3			
Jul24/23 Sep18/23	4		2			
с, s		Jum	~ 1			
	23 23 23 23 23 23 23 23 23 23	/23	<b>X</b> 0	3/21	Feb6/23 -	3 3
	Sep13/21 Aug15/22 Jan9/23 Feb6/23	Mar13/23 May1/23 Jul24/23	Sep I 0/23	Sep13/21 Aug15/22 Jan9/23	Feb6/23 Mar13/23 May1/23	Jul24/23 Sep18/23
	Copper (ppm)		400	Silicon (ppm)		
	Severe					٨
~~~~	15-1		300	0	1 1	AA NI
· · · · · · · · · · · · · · · · · · ·	툞 10		톱 200	- gubnormal	AAA	$\forall \uparrow \neq \downarrow \downarrow$
11122201020	5-		Λ 100	WV	VVV	1/ *
Jul24/23 Sep18/23	1 mm	non	NV .			V
Jul	Sep13/21 Aug15/22 - Jan9/23 - Feb6/23 -	Mar13/23 - May1/23 - Jul24/23 -	Sep 10/23	Sep13/21- Aug15/22 - Jan9/23 -	Feb6/23 - Mar13/23 - May1/23 -	Jul24/23 - Sep18/23 -
	Sep <sup>1</sup> Jam Feb	Mar1 May Jul2	Sep 1	Sep <sup>1</sup> Aug1	Feb Mar1 May	Jul2 Sep1
	Viscosity @ 100°C			Base Number		
	Abnormal		8.0 (B/F	110000000000000000000000000000000000000	n martan	
	16 Base 000114 Abnormal		(0/HOX Buil) Jack 4.0 2.0 888		. 11	LA
			E 54.0	Base	~ v	-V-V-
	형 12 -		tuny 2.0			
	THE REPORT OF THE PARTY OF		88			
	10 10 23	23 -	+ 0.0		23	23
	Sep13/21 Aug15/22 - Jan9/23 - Feb6/23 -	Mar13/23 May1/23 Jul24/23	sep 1 0/23	Sep13/21 Aug15/22 Jan9/23	Feb6/23 Mar13/23 May1/23	Jul24/23 Sep18/23
					-	
Laboratory	: WearCheck USA - 5				EDL NA Recip	
Sample No.			Nov 2023	SAND VALL	EY POWER STATION, 33	
Lab Number Unique Number			Nov 2023 n Baldridge		COLI	INSVILLE, AL US 35961
Test Package	: MOB 2	- agricolician . Do	Dalanayo		Contact: BRAN	
	contact Customar Sarvi	aa at 1 900 227 126	•	1-		Donoraudi com

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)

Certificate L2367

Submitted By: FRANK WILLIAMS

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