

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

CHP2 (S/N 2209855) Component

Biogas Engine

MOBIL PEGASUS 1005 (220 GAL)

Recommendation

Resample at the next service interval to monitor.

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.

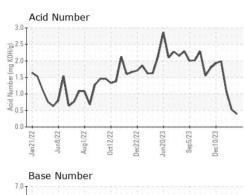


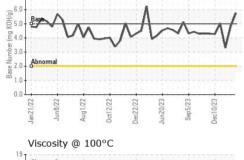
Aug2022 Oct2022 Dec2022 Jun2023 Sep2023 Dec202

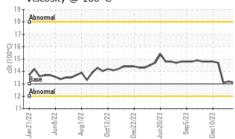
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0887430	WC0887427	WC0887424
Sample Date		Client Info		13 Feb 2024	01 Feb 2024	17 Jan 2024
Machine Age	hrs	Client Info		52850	52848	52631
Oil Age	hrs	Client Info		219	216	0
Oil Changed		Client Info		Not Changd	Not Changd	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel	•	WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	,	<1.0 NEG	<1.0 NEG	<1.0 NEG
		WC Method	>0.2	NEG	NEG	NEG
Glycol				-		-
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>15	2	1	0
Chromium	ppm	ASTM D5185m	>5	0	0	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>10	2	2	3
Lead	ppm	ASTM D5185m	>10	0	0	0
Copper	ppm	ASTM D5185m	>10	<1	0	0
Tin	ppm	ASTM D5185m	>5	0	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base		history1	history2
NUDITIVEO		method	iiiiii/base	current	TIIStory I	TIIStoryz
Boron	ppm	ASTM D5185m	IIIII/Dase	117	128	115
	ppm ppm		IIIII/Dase			
Boron		ASTM D5185m		117	128 0 0	115
Boron Barium	ppm	ASTM D5185m ASTM D5185m		117 0	128 0	115 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		117 0 <1 0 7	128 0 0	115 0 0
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		117 0 <1 0	128 0 0 0	115 0 0 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		117 0 <1 0 7	128 0 0 0 6	115 0 0 <1 24
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		117 0 <1 0 7 1504	128 0 0 0 6 1600	115 0 0 <1 24 1417
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		117 0 <1 0 7 1504 245	128 0 0 0 6 1600 283	115 0 0 <1 24 1417 271
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	117 0 <1 0 7 1504 245 331	128 0 0 0 6 1600 283 333	115 0 0 <1 24 1417 271 313
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		1117 0 <1 0 7 1504 245 331 2471	128 0 0 0 6 1600 283 333 2416	115 0 0 <1 24 1417 271 313 2211
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	1117 0 <1 0 7 1504 245 331 2471 current	128 0 0 6 1600 283 333 2416 history1	115 0 0 <1 24 1417 271 313 2211 history2
Boron 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 ASTM D5185m method ASTM D5185m	limit/base	1117 0 <1 0 7 1504 245 331 2471 current 2	128 0 0 6 1600 283 333 2416 history1 2	115 0 0 <1 24 1417 271 313 2211 history2 4
Boron 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 ASTM D5185m method ASTM D5185m	limit/base >300	1117 0 <1 0 7 1504 245 331 2471 current 2 0	128 0 0 6 1600 283 333 2416 history1 2 2 2	115 0 0 <1 24 1417 271 313 2211 history2 4 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >300 >20	1117 0 <1 0 7 1504 245 331 2471 current 2 0 1 current 0	128 0 0 6 1600 283 333 2416 history1 2 2 2 0	115 0 0 <1 24 1417 271 313 2211 history2 4 0 0 0
Boron 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	limit/base >300 >20 limit/base	117 0 <1 0 7 1504 245 331 2471 current 2 0 1	128 0 0 6 1600 283 333 2416 history1 2 2 2 0 history1	115 0 0 <1 24 1417 271 313 2211 history2 4 0 0 0 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >300 >20 limit/base	1117 0 <1 0 7 1504 245 331 2471 current 2 0 1 current 0	128 0 0 6 1600 283 333 2416 history1 2 2 2 0 history1 0	115 0 0 <1 24 1417 271 313 2211 history2 4 0 0 0 history2 0
Boron 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	limit/base >300 >20 limit/base	1117 0 <1 0 7 1504 245 331 2471 current 2 0 1 current 0 6.3	128 0 0 0 6 1600 283 333 2416 history1 2 2 2 0 history1 0 6.4	115 0 0 <1 24 1417 271 313 2211 history2 4 0 0 history2 0 5.5
Boron 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	Imit/base >300 >20 Imit/base >20 ≥20 ≥20 ≥20 ≥20 ≥20 ≥30	1117 0 <1 0 7 1504 245 331 2471 <u>current</u> 2 0 1 <u>current</u> 0 6.3 19.0	128 0 0 0 6 1600 283 333 2416 history1 2 2 0 history1 0 6.4 19.0	115 0 0 <1 24 1417 271 313 2211 history2 4 0 0 history2 0 5.5 19.2
Boron 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	limit/base >300 >20 limit/base >20 >30 >30	117 0 <1 0 7 1504 245 331 2471 2471 2471 2 0 1 2 0 1 0 6.3 19.0	128 0 0 0 6 1600 283 333 2416 history1 2 2 2 0 history1 0 6.4 19.0 history1	115 0 0 <1 24 1417 271 313 2211 history2 4 0 0 history2 0 5.5 19.2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7414	limit/base >300 >20 limit/base >20 >30 >30	117 0 <1 0 7 1504 245 331 2471 current 2 0 1 current 0 6.3 19.0 current 17.0	128 0 0 0 6 1600 283 333 2416 history1 2 2 2 0 history1 0 6.4 19.0 history1	115 0 0 <1 24 1417 271 313 2211 history2 4 0 0 0 history2 0 5.5 19.2 history2 16.4



OIL ANALYSIS REPORT







	VISUAL		method	limit/base	current	history1	history2
Λ	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
1 mg	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
N VI	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Uct.12.22 Jun 20,23 Sep5,23 Dec10,23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Ucti 1/42 Jun20/23 Sep5/23 Dec10/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
199920000000000000000000000000000000000	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROPER	TIES	method	limit/base	current	history1	history2
Num	Visc @ 100°C	cSt	ASTM D445	13	13.1	13.2	13.1
	GRAPHS						
	Iron (ppm)				Lead (ppm)		
3 3 3 5	⁴⁰			25	Severe		
Dec22/22 Jun20/23 Sep5/23 Dec10/23	30 - Severe			20			
Juu S	Abnormal			E 10	Abnormal		
	10-		~~~	\			
	h			L			
	Jan21/22 Jun8/22 Aug1/22 Oct12/22	Dec22/22	Jun20/23 Sep5/23	necinics	Jan21/22 Jun8/22 Aug1/22	0ct12/22 Dec22/22 Jun20/23	Sep 5/23 Dec 1 0/23
	Jan2 Jur Aug Oct1	Dec2	Jun2		Jan2 Jur Aug	Oct1 Dec2 Jun2	Sep
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	25 20 Severe			12	Courses 1		
	20	CAN LET	11111111111	1		ndecerina.	
23	E ¹⁵ and Abnormal			Ed (	Abnormal		
Dec22/22 Jun20/23 Sep5/23 Dec10/23			~~~	4	•		~~~~
	5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~ ~	$\sim$			
		2/22 -	un20/23 Sep5/23	c7/n	an21/22 Jun8/22 Aug1/22	2/22	Sep5/23 -
	Jan21/22 Jun8/22 Aug1/22 Oct12/22	Dec22/22	Jun20/23 -		Jan21/22 Jun8/22 Aug1/22	0ct12/22 Dec22/22 Jun20/23	Sep5/23
	Copper (ppm)				Silicon (ppm)		
	25 Severe	111211		600	C	11211111	
	20 - d			500			
	a 15 a 10 Abnormal			틆 300			
	10+0			200	)		
				100			
		/22	(23			2/22	5/23
	Jan21/22 Jun8/22 Aug1/22 Oct12/22	Dec22/22	Jun20/23 Sep5/23	116C1 U/ 2.3	Jan21/22 Jun8/22 Aug1/22	0ct12/22 Dec22/22 Jun20/23	Sep5/23 Dec10/23
	Viscosity @ 100°C				Base Number		—
	20 T						
	18 - Abnormal			(B),4.( Base Number (Mg KOH(B))	Base	٨	
	(J-001) tig 14-		~	B 4.0	- m	-NV	
	Apport			L Mung	Abnormal		v
	12 - Abnormal						PRIME PROPERTY
		/22 +	/23 -	•••••• 0.0	) + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +	/22 - /22 - 23 -	/23-
	Jan21/22 Jun8/22 Aug1/22 Oct12/22	Dec22/22	Jun20/23 Sep5/23	Dec 10/23	Jan21/22 Jun8/22 Aug1/22	0ct12/22 Dec22/22 Jun20/23	Sep5/23 Dec10/23
					1.57X		
Laboratory Sample No.	: WC0887430		Madison Ave., Cary, NC 27513 Received : 22 Feb 2024				OENERGY INC RIVERVIEW RD
150ACC (7025	: 06097213	Teste		3 Feb 2024	on Follow		AKRON, OH
	· : 10890066	Diagi	nosed : 23	3 Feb 2024 - Se	an Felton	Contact	US 44313
Certificate L2367 Test Package To discuss this sample report		vice at 1-	300-237-136	9.			JASON SHICK bbioenergy.com
- Denotes test methods that						Jasonswin	T:
tatements of conformity to s					rule (JCGM 106	<i>:2012)</i> F	: (330)864-7023

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