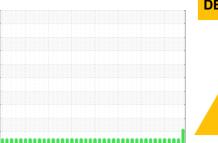


OIL ANALYSIS REPORT

Sample Rating Trend



DEGRADATION



CHP4-M0116 (S/N 2210062)

Component

Biogas Engine

MOBIL PEGASUS 1005 (120 GAL)

DIAGNOSIS

Recommendation

The oil is near the end of it's useful service life. recommend schedule an oil change. Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

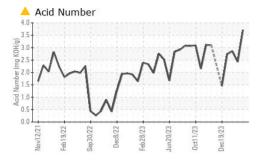
Fluid Condition

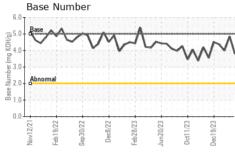
The BN level is low. The AN level is at the top-end of the recommended limit.

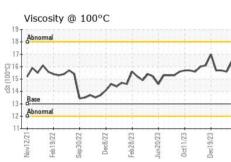
SAMPLE INFORMATION method limit/base current history1 history2 Sample Number Client Info WC0887425 WC0887425 WC0887420 Sample Date Client Info 53324 53063 52984 Oil Age hrs Client Info 9407 9146 9067 Oil Changed Client Info 9407 9146 9067 Oil Changed Client Info 9407 9146 9067 Sample Status More Method ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method -4.0 <1.0 <1.0 <1.0 <1.0 Water WC Method -8.0 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D		v2021 Feb2022 Sep2022 Dec2022 Feb2023 Jun2023 Oct2023 Dec2023						
Sample Date Client Info 13 Feb 2024 01 Feb 2024 17 Jan 2024 Machine Age hrs Client Info 53324 53063 52984	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2	
Machine Age hrs Client Info 9407 9146 9067	Sample Number		Client Info		WC0887432	WC0887425	WC0887440	
Oil Age hrs Client Info 9407 9146 9067 Oil Changed Client Info Not Changd Not Changd Not Changd Sample Status Image: Contact of the part	Sample Date		Client Info		13 Feb 2024	01 Feb 2024	17 Jan 2024	
Oil Changed Sample Status	Machine Age	hrs	Client Info		53324	53063	52984	
ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2	Oil Age	hrs	Client Info		9407	9146	9067	
CONTAMINATION	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd	
Fuel	Sample Status				ABNORMAL	NORMAL	NORMAL	
Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imit/base current history1 history2 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM DS185m >15 12 8 4 Chromium ppm ASTM DS185m >5 <1 0 <1 Nickel ppm ASTM DS185m >2 0 0 0 Tittanium ppm ASTM DS185m >2 0 0 0 Silver ppm ASTM DS185m >10 4 4 5 Lead ppm ASTM DS185m >10 4 2 3 Copper ppm ASTM DS185m >10 1 0 4 Tin ppm ASTM DS185m 0 0 0 0 Cadmium ppm ASTM DS185m 0 0 0 0	CONTAMINATION	١	method	limit/base	current	history1	history2	
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >15 12 8 4 Chromium ppm ASTM D5185m >5 <1 0 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >10 4 4 5 Lead ppm ASTM D5185m >10 1 0 4 1 Copper ppm ASTM D5185m >10 1 0 4 1 Lead ppm ASTM D5185m 0 0 0 0 0 Copper ppm ASTM D5185m 0 0 0	Fuel		WC Method	>4.0	<1.0	<1.0	<1.0	
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >15 12 8 4 Chromium ppm ASTM D5185m >5 <1	Water		WC Method	>0.2	NEG	NEG	NEG	
Iron	Glycol		WC Method		NEG	NEG	NEG	
Chromium ppm ASTM D5185m >5 <1 0 <1	WEAR METALS		method	limit/base	current	history1	history2	
Nickel	Iron	ppm	ASTM D5185m	>15	12	8	4	
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >10 4 4 5 Lead ppm ASTM D5185m >10 4 2 3 Copper ppm ASTM D5185m >10 1 0 4 Tin ppm ASTM D5185m >5 0 0 <1	Chromium	ppm	ASTM D5185m	>5	<1	0	<1	
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >10 4 4 5 Lead ppm ASTM D5185m >10 4 2 3 Copper ppm ASTM D5185m >10 1 0 4 Tin ppm ASTM D5185m >5 0 0 -1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 -1	Nickel	ppm	ASTM D5185m	>2	0	0	<1	
Aluminum ppm ASTM D5185m >10 4 4 5 Lead ppm ASTM D5185m >10 4 2 3 Copper ppm ASTM D5185m >10 1 0 4 Tin ppm ASTM D5185m >5 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 3 2 5 0 Manganese ppm ASTM D5185m 3 2 5 0 <1	Titanium	ppm	ASTM D5185m	>2	0	0	0	
Aluminum ppm ASTM D5185m >10 4 4 5 Lead ppm ASTM D5185m >10 4 2 3 Copper ppm ASTM D5185m >10 1 0 4 Tin ppm ASTM D5185m >5 0 0 -1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 93 107 96 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 3 2 5 Manganese ppm ASTM D5185m 0 0 -1 Magnesium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm AST	Silver		ASTM D5185m	>2	0	0	0	
Copper ppm ASTM D5185m >10 1 0 4 Tin ppm ASTM D5185m >5 0 0 <1	Aluminum	ppm	ASTM D5185m	>10	4	4	5	
Copper ppm ASTM D5185m >10 1 0 4 Tin ppm ASTM D5185m >5 0 0 <1	Lead		ASTM D5185m	>10	4	2	3	
Tin	Copper		ASTM D5185m	>10	1	0		
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 93 107 96 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 3 2 5 Manganese ppm ASTM D5185m 0 0 <1 Manganesium ppm ASTM D5185m 15 15 32 Calcium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >300 7 7	• •		ASTM D5185m	>5	0	0	<1	
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 93 107 96 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 3 2 5 Manganese ppm ASTM D5185m 0 0 <1	Vanadium		ASTM D5185m		0	0	0	
Boron ppm ASTM D5185m 93 107 96 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 3 2 5 Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 15 15 32 Calcium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current	Cadmium				0	0	0	
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 3 2 5 Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 15 15 32 Calcium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 </th <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2	
Molybdenum ppm ASTM D5185m 3 2 5 Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 15 15 32 Calcium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/:1mm *ASTM D7415 >30	Boron	ppm	ASTM D5185m		93	107	96	
Manganese ppm ASTM D5185m 0 <1 Magnesium ppm ASTM D5185m 15 15 32 Calcium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >20 4 <1	Barium	ppm	ASTM D5185m		0	0	0	
Magnesium ppm ASTM D5185m 15 15 32 Calcium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/.1mm *ASTM D7624 >20 12.4 11.4 11.4 Sulfation	Molybdenum	ppm	ASTM D5185m		3	2	5	
Calcium ppm ASTM D5185m 2160 2065 1966 Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1	Manganese	ppm	ASTM D5185m		0	0	<1	
Phosphorus ppm ASTM D5185m 327 347 335 Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1	Magnesium	ppm	ASTM D5185m		15	15	32	
Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 12.4 11.4 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 3	Calcium	ppm	ASTM D5185m		2160	2065	1966	
Zinc ppm ASTM D5185m 502 477 465 Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1	Phosphorus	ppm	ASTM D5185m		327	347	335	
Sulfur ppm ASTM D5185m 2780 2652 2445 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1	Zinc		ASTM D5185m		502	477	465	
Silicon ppm ASTM D5185m >300 7 7 6 Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 12.4 11.4 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 3.71 2.43 2.85	Sulfur		ASTM D5185m		2780	2652	2445	
Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1	CONTAMINANTS		method	limit/base	current	history1	history2	
Sodium ppm ASTM D5185m 6 8 5 Potassium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 12.4 11.4 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 ASTM D8045 3.71 2.43 2.85	Silicon	ppm	ASTM D5185m	>300	7	7	6	
Potassium ppm ASTM D5185m >20 4 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 12.4 11.4 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 ▲ 3.71 2.43 2.85	Sodium		ASTM D5185m		6	8	5	
Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 12.4 11.4 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 A 3.71 2.43 2.85	Potassium	ppm	ASTM D5185m	>20	4	<1	0	
Nitration Abs/cm *ASTM D7624 >20 12.4 11.4 11.4 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 A 3.71 2.43 2.85	INFRA-RED		method	limit/base	current	history1	history2	
Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 ASTM D8045 2.43 2.85	Soot %	%	*ASTM D7844		0.1	0.1	0.1	
Sulfation Abs/.1mm *ASTM D7415 >30 30.3 27.9 28.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 ASTM D8045 3.71 2.43 2.85	Nitration	Abs/cm	*ASTM D7624	>20	12.4	11.4	11.4	
Oxidation Abs/.1mm *ASTM D7414 >25 40.6 34.6 35.1 Acid Number (AN) mg KOH/g ASTM D8045 A 3.71 2.43 2.85	Sulfation							
Acid Number (AN) mg KOH/g ASTM D8045 ▲ 3.71 2.43 2.85	FLUID DEGRADA	TION	method	limit/base	current	history1	history2	
Acid Number (AN) mg K0H/g ASTM D8045 ▲ 3.71 2.43 2.85	Oxidation	Abs/.1mm	*ASTM D7414	>25	40.6	34.6	35.1	
	, ,	0 0		5.0				



OIL ANALYSIS REPORT



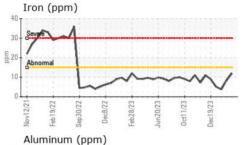


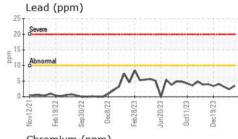


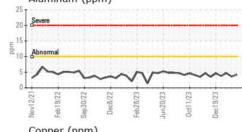
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERTIES		method	limit/base	current	history1	history2

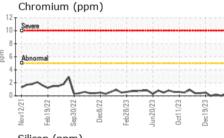
FLUID PROPER	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt.	ASTM D445	13	16.4	15.6	15.7

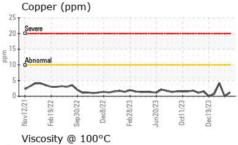
GRAPHS

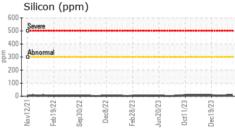


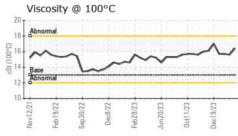


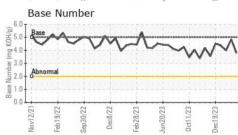
















Certificate L2367

Laboratory Sample No. Lab Number : 06097212 Unique Number: 10890065

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0887432

Received **Tested**

Diagnosed Test Package : MOB 2

KB BIOENERGY INC

2677 RIVERVIEW RD AKRON, OH US 44313

Contact: JASON SHICK jasons@kbbioenergy.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)

: 22 Feb 2024

: 27 Feb 2024

: 27 Feb 2024 - Jonathan Hester

F: (330)864-7023

T: