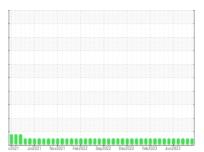


# **OIL ANALYSIS REPORT**

**Sample Rating Trend** 



NORMAL



CHP4-M0116 (S/N 2210062)

Component
Riogae Engin

**Biogas Engine** 

**MOBIL PEGASUS 1005 (120 GAL)** 

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### 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.

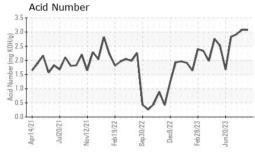
### Fluid Condition

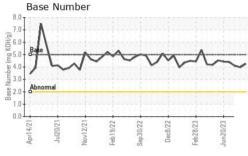
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is acceptable for the time in service.

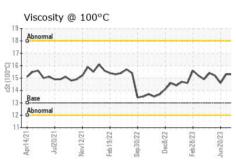
				Sep2022 Dec2022 Feb2023		
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0747970	WC0747976	WC0747978
Sample Date		Client Info		15 Aug 2023	02 Aug 2023	01 Aug 2023
Machine Age	hrs	Client Info		50051	49778	0
Oil Age	hrs	Client Info		6134	5861	0
Oil Changed		Client Info		Not Changd	Not Changd	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	٧	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>15	10	10	8
Chromium	ppm	ASTM D5185m	>5	<1	<1	<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	4	5	5
Lead	ppm	ASTM D5185m	>10	5	5	4
Copper	ppm	ASTM D5185m	>10	2	1	2
Tin	ppm	ASTM D5185m	>5	0	0	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 93	history1	history2
	ppm		limit/base			
Boron Barium	ppm	ASTM D5185m	limit/base	93	91	108
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	limit/base	93 0	91	108
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	93 0 4	91 0 4	108 0 4
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	93 0 4 <1	91 0 4 <1	108 0 4 <1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	93 0 4 <1 17	91 0 4 <1 16	108 0 4 <1 16
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	93 0 4 <1 17 1899	91 0 4 <1 16 1848	108 0 4 <1 16 2069
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	93 0 4 <1 17 1899 318	91 0 4 <1 16 1848 315	108 0 4 <1 16 2069 346
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 ASTM D5185m	limit/base	93 0 4 <1 17 1899 318 444	91 0 4 <1 16 1848 315 442	108 0 4 <1 16 2069 346 463
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		93 0 4 <1 17 1899 318 444 2792	91 0 4 <1 16 1848 315 442 2592	108 0 4 <1 16 2069 346 463 3120
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	93 0 4 <1 17 1899 318 444 2792 current	91 0 4 <1 16 1848 315 442 2592 history1	108 0 4 <1 16 2069 346 463 3120 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	93 0 4 <1 17 1899 318 444 2792 current 5	91 0 4 <1 16 1848 315 442 2592 history1	108 0 4 <1 16 2069 346 463 3120 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >300	93 0 4 <1 17 1899 318 444 2792 current 5 8	91 0 4 <1 16 1848 315 442 2592 history1 3 13	108 0 4 <1 16 2069 346 463 3120 history2 2 15
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >300 >20	93 0 4 <1 17 1899 318 444 2792 current 5 8 4	91 0 4 <1 16 1848 315 442 2592 history1 3 13	108 0 4 <1 16 2069 346 463 3120 history2 2 15 4
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	limit/base >300 >20 limit/base	93 0 4 <1 17 1899 318 444 2792 current 5 8 4	91 0 4 <1 16 1848 315 442 2592 history1 3 13 3	108 0 4 <1 16 2069 346 463 3120 history2 2 15 4 history2
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  method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >300 >20 limit/base	93 0 4 <1 17 1899 318 444 2792 current 5 8 4 current 0.1	91 0 4 <1 16 1848 315 442 2592 history1 3 13 3 history1 0	108 0 4 <1 16 2069 346 463 3120 history2 2 15 4 history2
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  method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >300 >20 limit/base >20	93 0 4 <1 17 1899 318 444 2792 current 5 8 4 current 0.1 11.1	91 0 4 <1 16 1848 315 442 2592 history1 3 13 3 history1 0 11.2	108 0 4 <1 16 2069 346 463 3120 history2 2 15 4 history2 0 11.2
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  method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m  method  *ASTM D7844  *ASTM D7624  *ASTM D76145	limit/base >300	93 0 4 <1 17 1899 318 444 2792 current 5 8 4 current 0.1 11.1 26.2 current	91 0 4 <1 16 1848 315 442 2592 history1 3 13 3 history1 0 11.2 26.9	108 0 4 <1 16 2069 346 463 3120 history2 2 15 4 history2 0 11.2 26.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m  method  *ASTM D7844  *ASTM D7624  *ASTM D7415  method	limit/base >300 >20 limit/base >20 >30 limit/base	93 0 4 <1 17 1899 318 444 2792 current 5 8 4 current 0.1 11.1 26.2	91 0 4 <1 16 1848 315 442 2592 history1 3 13 3 history1 0 11.2 26.9 history1	108 0 4 <1 16 2069 346 463 3120 history2 2 15 4 history2 0 11.2 26.8 history2



## **OIL ANALYSIS REPORT**





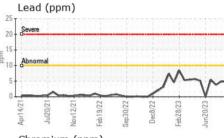


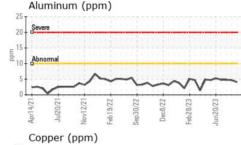
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

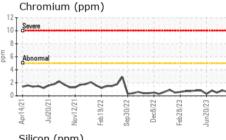
FLUID PROPER	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	13	15.6	15.3	15.3

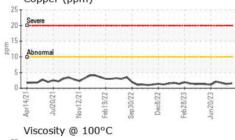
Seve	ere		^	1			
~	/						
Abn	ormal			1			
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<u> </u>	-17		-2	2	-2		53
Apr14/2	Jul20/2	Nov12/	Feb 19/2	Sep30/2.	Dec8/22	Feb28/23	Jun20/2

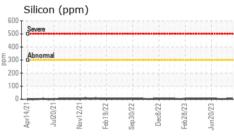
**GRAPHS** 

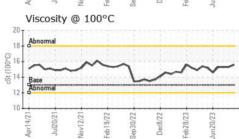


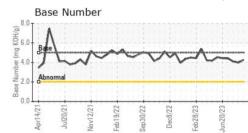
















Certificate L2367

Laboratory Sample No. Lab Number **Unique Number** Test Package : MOB 2

: WC0747970 : 05934944 : 10620215

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

: 25 Aug 2023 : 28 Aug 2023 Diagnostician : Sean Felton

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)

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Submitted By: ?