

OIL ANALYSIS REPORT

Sample Rating Trend







LGS00178

Component

Biogas Engine

MAHLER Q8 Mahler G8 SAE 40 (141 GAL)

DIAGNOSIS

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.

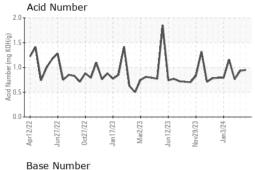
Fluid Condition

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.

		r2022 Jun20	22 Oct2022 Jan2023	Mar2023 Jun2023 Nov2023	Jan2024	
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0660918	WC0660920	WC0660921
Sample Date		Client Info		30 Jan 2024	23 Jan 2024	16 Jan 2024
Machine Age	hrs	Client Info		66207	66064	65903
Oil Age	hrs	Client Info		906	301	140
Oil Changed		Client Info		N/A	N/A	N/A
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	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>45	3	<1	1
Chromium	ppm	ASTM D5185m	>2	<1	0	<1
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m	>5	<1	0	0
Aluminum	ppm	ASTM D5185m	>10	4	3	2
Lead	ppm	ASTM D5185m	>5	4	<1	<1
Copper	ppm	ASTM D5185m	>14	6	1	1
Tin	ppm	ASTM D5185m	>13	3	1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		0	0	<1
	ppm	ASTM D5185m ASTM D5185m		0	0	<1 1
Boron						
Boron Barium	ppm	ASTM D5185m		0	0	1
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m		0 <1	0	1
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 2	0 0 <1	1 0 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 2 8	0 0 <1 11	1 0 0 6
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 2 8 2253	0 0 <1 11 2146	1 0 0 6 2126
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 2 8 2253 450	0 0 <1 11 2146 446	1 0 0 6 2126 495
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	0 <1 2 8 2253 450 547	0 0 <1 11 2146 446 529	1 0 0 6 2126 495 508
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	limit/base >200	0 <1 2 8 2253 450 547 4324	0 0 <1 11 2146 446 529 3844	1 0 0 6 2126 495 508 3754
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		0 <1 2 8 2253 450 547 4324 current	0 0 0 <1 11 2146 446 529 3844 history1	1 0 0 6 2126 495 508 3754 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m		0 <1 2 8 2253 450 547 4324 current 155	0 0 0 <1 11 2146 446 529 3844 history1	1 0 0 6 2126 495 508 3754 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	>200	0 <1 2 8 2253 450 547 4324 current 155 3	0 0 -<1 11 2146 446 529 3844 history1 115 -<1	1 0 0 6 2126 495 508 3754 history2 71
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	>200 >20	0 <1 2 8 2253 450 547 4324 current 155 3 3	0 0 0 <1 11 2146 446 529 3844 history1 115 <1	1 0 0 6 2126 495 508 3754 history2 71 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 ppm	ASTM D5185m	>200 >20	0 <1 2 8 2253 450 547 4324 current 155 3 3 current	0 0 0 <1 11 2146 446 529 3844 history1 115 <1 0	1 0 0 6 2126 495 508 3754 history2 71 0 1
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	>200 >20 limit/base	0 <1 2 8 2253 450 547 4324 current 155 3 3 current 0	0 0 0 <1 11 2146 446 529 3844 history1 115 <1 0	1 0 0 6 2126 495 508 3754 history2 71 0 1
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	>200 >20 limit/base >20	0 <1 2 8 2253 450 547 4324 current 155 3 3 current 0 5.3	0 0 0 <1 11 2146 446 529 3844 history1 115 <1 0 history1 0 5.3	1 0 0 6 2126 495 508 3754 history2 71 0 1 history2 0 5.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm	ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844	>200 >20 limit/base >20 >30 limit/base	0 <1 2 8 2253 450 547 4324 current 155 3 3 current 0 5.3 19.6 current	0 0 0 <1 11 2146 446 529 3844 history1 115 <1 0 history1 0 5.3 18.7 history1	1 0 0 6 2126 495 508 3754 history2 71 0 1 history2 0 5.2 17.1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm	ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D78185m *ASTM D78144 *ASTM D7844 *ASTM D7844	>200 >20 limit/base >20 >30	0 <1 2 8 2253 450 547 4324 current 155 3 3 19.6 current 10.2	0 0 0 <1 11 2146 446 529 3844 history1 115 <1 0 history1 0 5.3 18.7 history1 9.9	1 0 0 6 2126 495 508 3754 history2 71 0 1 history2 0 5.2 17.1 history2 9.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm	ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844	>200 >20 limit/base >20 >30 limit/base	0 <1 2 8 2253 450 547 4324 current 155 3 3 current 0 5.3 19.6 current	0 0 0 <1 11 2146 446 529 3844 history1 115 <1 0 history1 0 5.3 18.7 history1	1 0 0 6 2126 495 508 3754 history2 71 0 1 history2 0 5.2 17.1



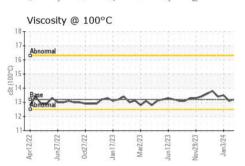
OIL ANALYSIS REPORT

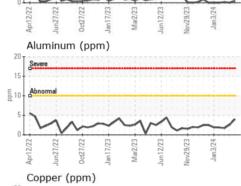


VISUAL		method			history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

8.0 - Base						A		-
6.0			M	7		VL	M	1
4.0		1						•
1	V	V						
2 0								
								-
Apr12/22	Jun27/22	0ct27/22	Jan17/23 -	Mar2/23	Jun12/23	Nov29/23 -	Jan3/24	

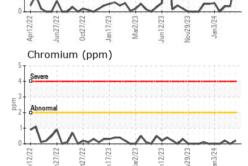


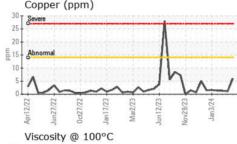


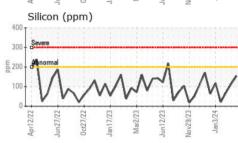


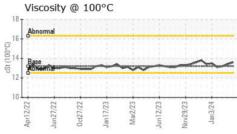
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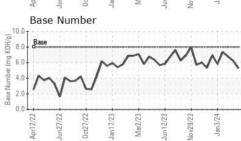
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Certificate L2367

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

: WC0660918 : 06077786

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved Diagnosed : 10859877

: 01 Feb 2024 : 04 Feb 2024 Diagnostician : Don Baldridge

BI-COUNTY 3214 DOVER RD WOODLAWN, TN US 37191

Contact: KEVIN WEAVER kevin.weaver@cubedistrictenergy.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)

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