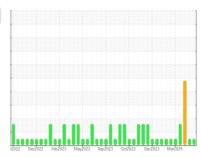


OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id
4EK05286

Component Biogas Engine

MAHLER Q8 Mahler G8 SAE 40 (--- 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.

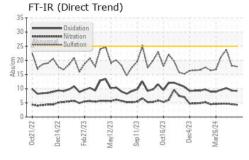
Fluid Condition

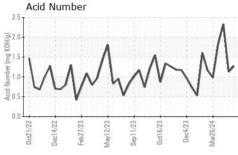
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

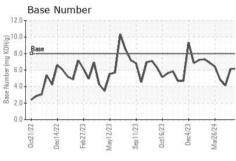
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0880263	WC0880265	WC0880270
Sample Date		Client Info		23 Apr 2024	16 Apr 2024	11 Apr 2024
Machine Age	hrs	Client Info		82851	82739	82615
Oil Age	hrs	Client Info		212	100	483
Oil Changed		Client Info		N/A	Changed	N/A
Sample Status				NORMAL	NORMAL	SEVERE
CONTAMINATION	V	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	5	3	14
Chromium	ppm	ASTM D5185m	>2	<1	0	2
Nickel	ppm	ASTM D5185m	>2	1	0	1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>10	3	2	3
Lead	ppm	ASTM D5185m	>5	<1	0	1
Copper	ppm	ASTM D5185m	>14	2	1	7
Tin	ppm	ASTM D5185m	>13	2	2	4
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		<1	0	<1
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		0	0	1
Boron Barium	ppm	ASTM D5185m ASTM D5185m		0	0	1 0
	• • • • • • • • • • • • • • • • • • • •					
Barium	ppm	ASTM D5185m		0	0	0
Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m		0 <1	0	0
Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 <1	0 0 <1	0 1 1
Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 <1 5	0 0 <1 4	0 1 1 6
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 <1 5 2185	0 0 <1 4 2143	0 1 1 6 2443
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 <1 <1 5 2185 412	0 0 <1 4 2143 348	0 1 1 6 2443 419
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 <1 5 2185 412 450	0 0 <1 4 2143 348 363	0 1 1 6 2443 419 458
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 <1 5 2185 412 450 3936	0 0 <1 4 2143 348 363 3313	0 1 1 6 2443 419 458 5747
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 <1 5 2185 412 450 3936 current	0 0 <1 4 2143 348 363 3313 history1	0 1 1 6 2443 419 458 5747 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m		0 <1 <1 5 2185 412 450 3936 current	0 0 <1 4 2143 348 363 3313 history1	0 1 1 6 2443 419 458 5747 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	>200	0 <1 <1 5 2185 412 450 3936 current 90 <1	0 0 <1 4 2143 348 363 3313 history1 89 2	0 1 1 6 2443 419 458 5747 history2 318 2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	>200	0 <1 <1 5 2185 412 450 3936 current 90 <1 <1	0 0 0 <1 4 2143 348 363 3313 history1 89 2	0 1 1 6 2443 419 458 5747 history2 318 2 2
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 method ASTM D5185m ASTM D5185m ASTM D5185m	>200 >20 limit/base	0 <1 <1 <1 5 2185 412 450 3936 current 90 <1 <1 current	0 0 <1 4 2143 348 363 3313 history1 89 2 0	0 1 1 6 2443 419 458 5747 history2 18 2 2 history2
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	>200 >20 limit/base	0 <1 <1 <1 5 2185 412 450 3936 current 90 <1 <1 current 0	0 0 0 <1 4 2143 348 363 3313 history1 89 2 0 history1	0 1 1 6 2443 419 458 5747 history2 ▲ 318 2 2
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	>200 >20 limit/base >20	0 <1 <1 <1 5 2185 412 450 3936 current 90 <1 <1 current 0 4.3	0 0 0 <1 4 2143 348 363 3313 history1 89 2 0 history1 0 4.5	0 1 1 6 2443 419 458 5747 history2 ▲ 318 2 2 history2 0 4.7
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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D76145	>200 >20 limit/base >20 >30	0 <1 <1 <1 5 2185 412 450 3936 current 90 <1 <1 current 0 4.3 17.8	0 0 0 <1 4 2143 348 363 3313 history1 89 2 0 history1 0 4.5 18.1	0 1 1 6 2443 419 458 5747 history2 ▲ 318 2 2 history2 0 4.7 23.8
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 ASTM D5185m ASTM D5185m Method	>200 >20 limit/base >20 >30 limit/base	0 <1 <1 5 2185 412 450 3936 current 90 <1 <1 <1 current 0 4.3 17.8 current	0 0 0 <1 4 2143 348 363 3313 history1 89 2 0 history1 0 4.5 18.1	0 1 1 6 2443 419 458 5747 history2 ▲ 318 2 2 history2 0 4.7 23.8
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 Method ASTM D5185m ASTM D78185m method *ASTM D7844 *ASTM D7624 *ASTM D7415 method *ASTM D7414	>200 >20 limit/base >20 >30 limit/base >25	0 <1 <1 5 2185 412 450 3936 current 90 <1 <1 current 0 4.3 17.8 current 9.2	0 0 0 <1 4 2143 348 363 3313 history1 89 2 0 history1 0 4.5 18.1 history1 9.3	0 1 1 6 2443 419 458 5747 history2 ▲ 318 2 2 history2 0 4.7 23.8 history2

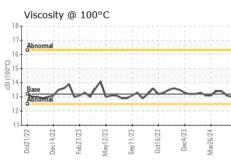


OIL ANALYSIS REPORT





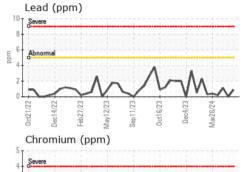


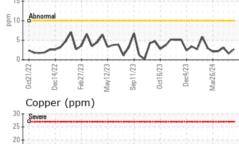


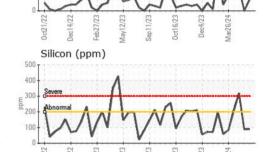
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

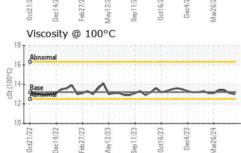
FLUID PROPER	HES	method			history1	history2
Visc @ 100°C	cSt	ASTM D445	13.2	13.0	13.1	13.4

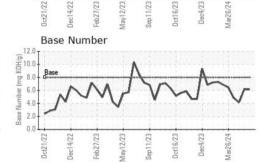
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	Dec14/22	_^_		_^	m	many















Report Id: BICWOOTN [WUSCAR] 06160572 (Generated: 04/26/2024 15:38:12) Rev: 1

Laboratory Sample No.

Lab Number : 06160572

10

: WC0880263 Unique Number : 10995995

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 25 Apr 2024

Tested : 26 Apr 2024 Diagnosed : 26 Apr 2024 - Sean Felton

BI-COUNTY 3214 DOVER RD WOODLAWN, TN US 37191 Contact: KEVIN WEAVER

Test Package : MOB 2 Certificate 12367 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.

kevin.weaver@cubedistrictenergy.com T:

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Contact/Location: KEVIN WEAVER - BICWOOTN

F: