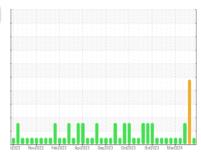


OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id
4EK05286
Component

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.

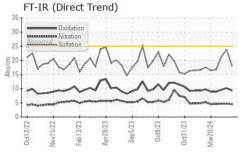
Fluid Condition

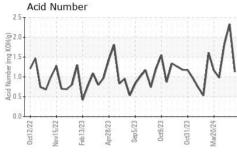
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

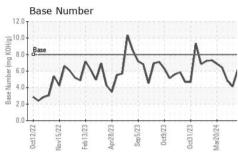
SAMPLE INFORMATION method limit base current history1 history2 Sample Number Client Info WC0880265 WC0880272 WC0880272 Sample Date Client Info 82739 82615 82471 Machine Age hrs Client Info 100 483 339 Oil Changed Client Info 100 483 339 Oil Changed Client Info NORMAL SEVERE ABNORMAL CONTAMINATION method Imit base current history1 history2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 <1.0 Water WC Method NEG NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method limit base current history1 history2 Iron ppm ASTM D5165m >2 0 1 1 Kinc ppm							
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 100 483 339 Oil Age hrs Client Info 100 483 339 Oil Changed Client Info Changed N/A N/A Sample Status NORMAL SEVERE ABNORMAL CONTAMINATION method Imit/Dase current history1 history2 Fuel	Sample Number		Client Info		WC0880265	WC0880270	WC0880272
Oil Age hrs Client Info 100 483 339 Oil Changed Client Info Changed N/A N/A Sample Status Image: Client Info Changed N/A N/A N/A Sample Status Image: Client Info Changed N/A N/A N/A CONTAMINATION method Imitibase current history1 history2 Fuel WC Method <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1	Sample Date		Client Info		16 Apr 2024	11 Apr 2024	05 Apr 2024
Oil Changed Sample Status Client Info Changed NORMAL N/A N/A CONTAMINATION method limit/base current history1 history2 Fuel WC Method >4.0 <1.0	Machine Age	hrs	Client Info		82739	82615	82471
Sample Status	Oil Age	hrs	Client Info		100	483	339
Fuel	Oil Changed		Client Info		Changed	N/A	N/A
Fuel	Sample Status				NORMAL	SEVERE	ABNORMAL
Water Glycol WC Method >0.1 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM DS185m >45 3 14 12 Chromium ppm ASTM DS185m >2 0 2 <1	CONTAMINATIO	N	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.1	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >2 0 2 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 0 1 1 Titanium ppm ASTM D5185m 0 <1	Iron	ppm	ASTM D5185m	>45	3	14	12
Titanium ppm ASTM D5185m 0 <1 0 Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >5 0 1 <1	Chromium	ppm	ASTM D5185m	>2	0	2	<1
Titanium ppm ASTM D5185m 0 <1 0 Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >10 2 3 2 Lead ppm ASTM D5185m >5 0 1 <1 Copper ppm ASTM D5185m >14 1 7 4 Tin ppm ASTM D5185m >13 2 4 2 Vanadium ppm ASTM D5185m 0 <1 0 <1 Cadmium ppm ASTM D5185m 0 <1 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 0 Barium ppm ASTM D5185m 0 1 <1 Manganesium ppm ASTM D5185m <1 1 <1 <1 Ma	Nickel	ppm	ASTM D5185m	>2	0	1	1
Aluminum ppm ASTM D5185m >10 2 3 2 Lead ppm ASTM D5185m >5 0 1 <1	Titanium	ppm	ASTM D5185m		0	<1	0
Lead ppm ASTM D5185m >5 0 1 <1 Copper ppm ASTM D5185m >14 1 7 4 Tin ppm ASTM D5185m >13 2 4 2 Vanadium ppm ASTM D5185m -11 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 0 Barium ppm ASTM D5185m 0 1 1 Barium ppm ASTM D5185m 0 1 <1 Magnesium ppm ASTM D5185m -1 1 <1 <1 Magnesium ppm ASTM D5185m 2143 2443 252 Calcium ppm ASTM D5185m 348 419 411 <1	Silver	ppm	ASTM D5185m	>5	0	0	0
Copper ppm ASTM D5185m >14 1 7 4 Tin ppm ASTM D5185m >13 2 4 2 Vanadium ppm ASTM D5185m <1	Aluminum	ppm	ASTM D5185m	>10	2	3	2
Tin ppm ASTM D5185m >13 2 4 2 Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 0 Barium ppm ASTM D5185m 0 1 0 Molybdenum ppm ASTM D5185m 0 1 <1 Manganese ppm ASTM D5185m 4 6 6 Magnesium ppm ASTM D5185m 2143 2443 2522 Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 <t< td=""><td>Lead</td><td>ppm</td><td>ASTM D5185m</td><td>>5</td><th>0</th><td>1</td><td><1</td></t<>	Lead	ppm	ASTM D5185m	>5	0	1	<1
Vanadium ppm ASTM D5185m <1 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 Boron ppm ASTM D5185m 0 1 0 Barium ppm ASTM D5185m 0 0 <1 <1 Molybdenum ppm ASTM D5185m 0 1 <1 <1 Manganese ppm ASTM D5185m 4 6 6 Calcium ppm ASTM D5185m 4 6 6 Calcium ppm ASTM D5185m 2143 2443 2522 Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM	Copper	ppm	ASTM D5185m	>14	1	7	4
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 0 Barium ppm ASTM D5185m 0 0 <1	Tin	ppm	ASTM D5185m	>13	2	4	2
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 0 Barium ppm ASTM D5185m 0 0 <1	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron ppm ASTM D5185m 0 1 0 Barium ppm ASTM D5185m 0 0 <1 Molybdenum ppm ASTM D5185m 0 1 <1 Manganese ppm ASTM D5185m <1 1 <1 Magnesium ppm ASTM D5185m 4 6 6 Calcium ppm ASTM D5185m 2143 2443 2522 Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 318 206 Sodium ppm ASTM D5185m >20 9 2 1 INFRA-RED method limit/base current	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 0 1 <1 Manganese ppm ASTM D5185m <1 1 <1 Magnesium ppm ASTM D5185m 4 6 6 Calcium ppm ASTM D5185m 2143 2443 2522 Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 318 206 Sodium ppm ASTM D5185m >20 0 2 2 Potassium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM	Boron	ppm	ASTM D5185m		0	1	0
Manganese ppm ASTM D5185m <1 1 <1 Magnesium ppm ASTM D5185m 4 6 6 Calcium ppm ASTM D5185m 2143 2443 2522 Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m >20 0 2 2 Potassium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 4.5 4.7 4.7 Sulfation <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td>0</td> <td><1</td>	Barium	ppm	ASTM D5185m		0	0	<1
Magnesium ppm ASTM D5185m 4 6 6 Calcium ppm ASTM D5185m 2143 2443 2522 Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 2 <1	Molybdenum	ppm	ASTM D5185m		0	1	<1
Calcium ppm ASTM D5185m 2143 2443 2522 Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m >20 0 2 2 Potassium ppm ASTM D5185m >20 0 2 <1	Manganese	ppm	ASTM D5185m		<1	1	<1
Phosphorus ppm ASTM D5185m 348 419 411 Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m >20 0 2 2 Potassium ppm ASTM D5185m >20 0 2 <1	Magnesium	ppm	ASTM D5185m		4	6	6
Zinc ppm ASTM D5185m 363 458 478 Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 2 <1	Calcium	ppm	ASTM D5185m		2143	2443	2522
Sulfur ppm ASTM D5185m 3313 5747 5355 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 2 <1	Phosphorus	ppm	ASTM D5185m		348	419	411
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 2 <1	Zinc	ppm	ASTM D5185m		363	458	478
Silicon ppm ASTM D5185m >200 89 ▲ 318 ▲ 206 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 4.5 4.7 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.8 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.3 10.2 9.6 Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	Sulfur	ppm	ASTM D5185m		3313	5747	5355
Sodium ppm ASTM D5185m 2 2 2 2 2 Potassium ppm ASTM D5185m >20 0 2 <1	CONTAMINANTS	;	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 2 2 2 2 2 Potassium ppm ASTM D5185m >20 0 2 <1 1 2 2 2 2 <1 2 2 2 2 <1 2 2 2 2 <1 2 2 2 <1 2 <1 2 <1 2 <1 2 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Silicon	ppm	ASTM D5185m	>200	89	1 318	<u>^</u> 206
Potassium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 4.5 4.7 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.8 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.3 10.2 9.6 Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	Sodium		ASTM D5185m		2	2	2
Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 4.5 4.7 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.8 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.3 10.2 9.6 Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	Potassium	ppm	ASTM D5185m	>20	0	2	<1
Nitration Abs/cm *ASTM D7624 > 20 4.5 4.7 4.7 Sulfation Abs/.1mm *ASTM D7415 > 30 18.1 23.8 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 9.3 10.2 9.6 Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 4.5 4.7 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.8 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.3 10.2 9.6 Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	Soot %	%	*ASTM D7844		0	0	0
Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.8 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.3 10.2 9.6 Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	Nitration	Abs/cm	*ASTM D7624	>20	4.5	4.7	4.7
Oxidation Abs/.1mm *ASTM D7414 >25 9.3 10.2 9.6 Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83							
Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
Acid Number (AN) mg KOH/g ASTM D8045 1.13 2.33 1.83	Oxidation	Abs/.1mm	*ASTM D7414	>25	9.3	10.2	9.6
(,)							
	Acid Number (AN)	mg KOH/g	ASTM D8045		1.13	2.33	1.83

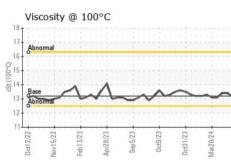


OIL ANALYSIS REPORT





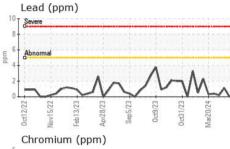


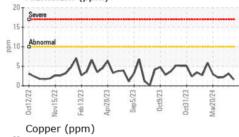


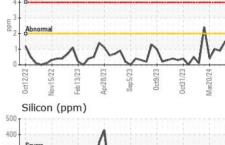
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

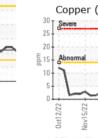
FLUID PROPER	HES	method			history1	history2
Visc @ 100°C	cSt	ASTM D445	13.2	13.1	13.4	13.4

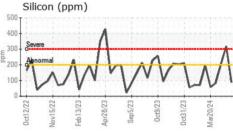
Severe					11333		
Abnom	mal				11211		A
20		۸	^	۸	$\hat{}$	٠,	M
0 22	722	23	23	73	23	Z3	42
Oct12/22	Nov15/2	Feb13/23	Apr28/23	Sep5/23	0ct9/23	Oct31/23	Mar20/24
	inuu	n (pp	m)				

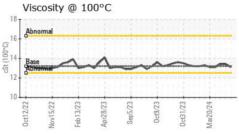


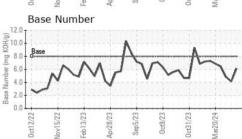
















Laboratory Sample No.

: WC0880265 Lab Number : 06154651 Unique Number : 10990074

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 19 Apr 2024 **Tested** : 23 Apr 2024 Diagnosed

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

F: Contact/Location: KEVIN WEAVER - BICWOOTN

kevin.weaver@cubedistrictenergy.com

T: