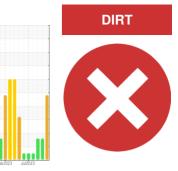


OIL ANALYSIS REPORT

Sample Rating Trend





DIAGNOSIS

Recommendation

We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

EDLCOV

Component **Biogas Engine**

COVM01BL

Wear

All component wear rates are normal.

Contamination

Elemental level of silicon (Si) above normal indicating ingress of seal material.

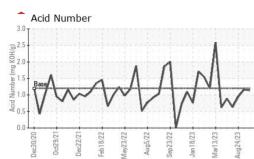
Fluid Condition

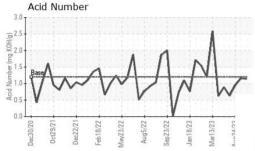
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid.

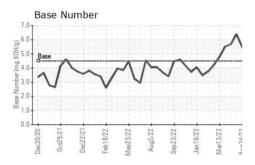
Sample Date Info 26 Sep 2023 21 Sep 2023 24 Aug 2023 Machine Age hrs Client Info 125038 124913 124751 Oil Age hrs Client Info 1077 952 790 Oil Changed Client Info Not Changd ABNORMAL CONTAMINATION method imit/base current history1 history2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Glycol WC Method >5.5 5 4 3 Chromium ppm ASTM D5185m >5 5 4 3 Silver ppm ASTM D5185m >6 4 3 2 2 Silver ppm ASTM D5185m >6 3 2 2 2 Copper ppm ASTM D5185m >6 3 2 2 2 2 2 <t< th=""><th>SAMPLE INFORM</th><th>IATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 125038 124913 124751 Oil Age hrs Client Info 1077 952 790 Oil Age Client Info Not Changd Not Changd Not Changd Sample Status Imit/base current history1 History2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Glycol WC Method >4.0 <1.0 <1.0 <1.0 WEAR METALS method imit/base current history1 history2 Iron ppm ASTM D5185m >4 <1 <1 0 Nickel ppm ASTM D5185m >2 <1 1 0 Muminum ppm ASTM D5185m >6 3 2<	Sample Number		Client Info		WC0853583	WC0853576	WC0816091
Oil Age hrs Client Info 1077 952 790 Oil Changed Client Info Not Changd Not Changd <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>26 Sep 2023</th> <th>21 Sep 2023</th> <th>24 Aug 2023</th>	Sample Date		Client Info		26 Sep 2023	21 Sep 2023	24 Aug 2023
Oil Changed Client Info Not Changd Not Changd Not Changd ABNORMAL Sample Status Image of the second	Machine Age	hrs	Client Info		125038	124913	124751
Sample Status rethod imit/base current history1 history2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 <1.0 Glycol WC Method >4.0 <1.0 <1.0 <1.0 <1.0 Wear METALS WC Method NEG NEG NEG NEG Wear METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >15 5 4 3 Ohromium ppm ASTM D5185m >2 <1 1 0 Nickel ppm ASTM D5185m >2 <1 1 0 Silver ppm ASTM D5185m >6 4 3 2 2 Copper ppm ASTM D5185m >6 3 2 2 Cadmium ppm ASTM D5185m >4 3 3 2 Cadmium ppm ASTM D5185m <	Oil Age	hrs	Client Info		1077	952	790
CONTAMINATION 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 5 4 3 Chromium ppm ASTM D5185m<>2 <1 1 0 Nickel ppm ASTM D5185m<>2 <1 0 <1 Silver ppm ASTM D5185m<>5 0 0 <1 Silver ppm ASTM D5185m<>5 0 0 <1 Copper ppm ASTM D5185m<>6 3 2 2 Cadmium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 <1 ASTM D5185m 0 0 2 0 <1 Molybdenum	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Fuel WC Method >4.0 <1.0	Sample Status				SEVERE	ABNORMAL	ABNORMAL
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m<>15 5 4 3 Chromium ppm ASTM D5185m<>2 <1 1 0 Nickel ppm ASTM D5185m <2 <1 1 0 Silver ppm ASTM D5185m >5 0 0 <1 Silver ppm ASTM D5185m >6 4 3 2 Lead ppm ASTM D5185m >6 3 2 2 Copper ppm ASTM D5185m >4 3 3 2 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 7 7 7 7 Barium ppm ASTM D5185m 42 34 41 Cadmium ppm ASTM D5185m <th>CONTAMINATION</th> <th>N</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	CONTAMINATION	N	method	limit/base	current	history1	history2
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Titanium ppm ASTM D5185m <1	Chromium	ppm	ASTM D5185m	>4	<1	<1	0
Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >6 4 3 2 Lead ppm ASTM D5185m >9 2 2 2 Copper ppm ASTM D5185m >6 3 2 2 Vanadium ppm ASTM D5185m >6 3 2 2 Vanadium ppm ASTM D5185m >6 3 2 2 Vanadium ppm ASTM D5185m >6 3 2 2 Cadmium ppm ASTM D5185m 0 0 0 2 Boron ppm ASTM D5185m 7 7 7 7 Barium ppm ASTM D5185m 42 34 41 Calcium ppm ASTM D5185m 311 283 316 Zinc ppm ASTM D5185m 381 371 377 Suffur	Nickel	ppm	ASTM D5185m	>2	<1	1	0
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CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >181 216 ▲ 200 ▲ 188 Sodium ppm ASTM D5185m >181 216 ▲ 200 ▲ 188 Sodium ppm ASTM D5185m >11 9 15 Potassium ppm ASTM D5185m >20 0 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 6.0 5.8 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 17.7 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		42 1804 311	34 1767 283	<1 41 1924 316
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Sodium ppm ASTM D5185m 11 9 15 Potassium ppm ASTM D5185m<>20 0 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 0 Nitration Abs/cm *ASTM D7624 >20 6.0 5.8 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 17.7 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		42 1804 311 381	34 1767 283 371 2167	<1 41 1924 316 377 2336
Potassium ppm ASTM D5185m >20 0 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 6.0 5.8 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 17.7 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method		42 1804 311 381 2028 current	34 1767 283 371 2167 history1	<1 41 1924 316 377 2336 history2
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Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 6.0 5.8 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 17.7 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>181	42 1804 311 381 2028 Current 216 11	34 1767 283 371 2167 history1 ▲ 200 9	<1 41 1924 316 377 2336 history2 188 15
Nitration Abs/cm *ASTM D7624 >20 6.0 5.8 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 17.7 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>181 >20	42 1804 311 381 2028 Current 216 11	34 1767 283 371 2167 history1 ▲ 200 9 1	<1 41 1924 316 377 2336 history2 ▲ 188 15 0
Sulfation Abs/.1mm *ASTM D7415 >30 18.1 17.7 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm 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	>181 >20	42 1804 311 381 2028 current 216 11 0 current	34 1767 283 371 2167 history1 200 9 1 1 history1	<1 41 1924 316 377 2336 history2 ▲ 188 15 0 history2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm 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	>181 >20 limit/base	42 1804 311 381 2028 current 216 11 0 current 0	34 1767 283 371 2167 history1 200 9 1 1 history1 0	<1 41 1924 316 377 2336 history2 ▲ 188 15 0 history2 0
Oxidation Abs/.1mm *ASTM D7414 >25 12.4 11.3 10.4 Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844	>181 >20 limit/base >20	42 1804 311 381 2028 current 216 11 0 current 0 6.0	34 1767 283 371 2167 history1 ▲ 200 9 1 1 history1 0 5.8	<1 41 1924 316 377 2336 history2 ▲ 188 15 0 history2 0 5.5
Acid Number (AN) mg KOH/g ASTM D8045 1.2 1.14 1.16 0.949	Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm 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 *ASTM D7844 *ASTM D7844	>181 >20 limit/base >20	42 1804 311 381 2028 current 216 11 0 current 0 6.0	34 1767 283 371 2167 history1 ▲ 200 9 1 1 history1 0 5.8	<1 41 1924 316 377 2336 history2 ▲ 188 15 0 history2 0 5.5
	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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624	>181 >20 limit/base >20 >30	42 1804 311 381 2028 current 216 11 0 current 0 6.0 18.1	34 1767 283 371 2167	<1 41 1924 316 377 2336 history2 ▲ 188 15 0 history2 0 5.5 17.0
Base Number (BN) mg KOH/g ASTM D2896 4.5 4.68 4.96 5.46	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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624	>181 >20 limit/base >20 >30 limit/base	42 1804 311 381 2028 current 216 11 0 current 0 6.0 18.1 current	34 1767 283 371 2167	<1 41 1924 316 377 2336 history2 ▲ 188 15 0 history2 0 5.5 17.0
	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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7414	>181 >20 limit/base >20 >30 limit/base >25	42 1804 311 381 2028 Current 216 11 0 Current 0 6.0 18.1 Current 12.4	34 1767 283 371 2167 bistory1 200 9 1 1 bistory1 0 5.8 17.7 bistory1 history1 11.3	<1 41 1924 316 377 2336 history2 ▲ 188 15 0 history2 0 5.5 17.0 history2 10.4

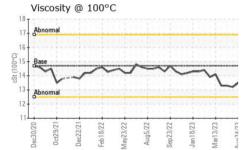


OIL ANALYSIS REPORT

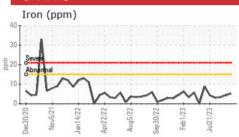


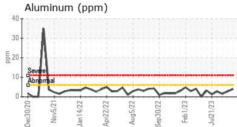


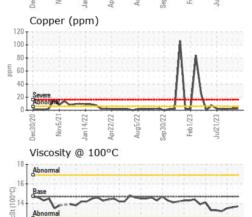




VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.7	13.7	13.6	13.5
GRAPHS						







Mar13/23 -Aug24/23 -

: 29 Sep 2023

: 02 Oct 2023

: Sean Felton

Sep23/22

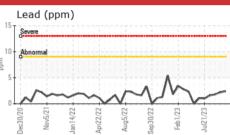
: WearCheck USA - 501 Madison Ave., Cary, NC 27513

Diagnostician

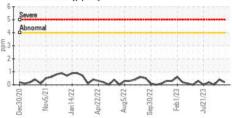
Received

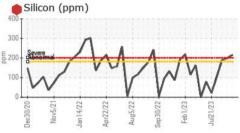
Diagnosed

Jan 18/23

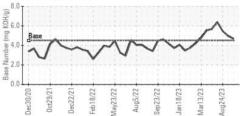


Chromium (ppm)





Base Number



EDL NA Recips-Covel COVEL GARDENS POWER STATION, 8611 COVEL ROAD SAN ANTONIO, TX US 78252 Contact: ARIEL CARRION ariel.carrion@edlenergy.com T: 06:2012) F:



 Certificate 12367
 Test Package
 : MOB 2

 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)

Dec22/21 Feb18/22 May23/22 Aug5/22

10

Laboratory

Sample No.

Lab Number

Unique Number

Dec30/20

: WC0853583

: 05964760

: 10671311