

OIL ANALYSIS REPORT

NORMAL

Machine Id LGS00181

Component Middle Biogas Engine

Fluic

CITGO PACEMAKER GAS ENGINE LFG LA 40 (--- GAL)

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

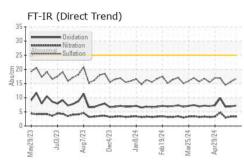
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

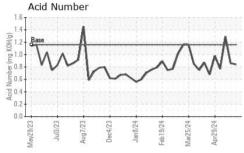
SAMPLE INFORM	1ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0803470	WC0803469	WC0803468
Sample Date		Client Info		11 Jun 2024	03 Jun 2024	29 May 2024
Machine Age	hrs	Client Info		67544	67377	67257
Oil Age	hrs	Client Info		394	136	15
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	۷	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	6	2	2
Chromium	ppm	ASTM D5185m	>2	<1	0	0
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>10	1	<1	1
Lead	ppm	ASTM D5185m	>5	<1	0	<1
Copper	ppm	ASTM D5185m	>14	2	<1	<1
Tin	ppm	ASTM D5185m	>13	2	<1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 0	history1 0	history2 3
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	0	0 0 2	3
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m	limit/base	0 0	0 0 2 0	3 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 3 <1 22	0 0 2 0 20	3 0 4 0 27
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 3 <1 22 1657	0 0 2 0 20 1509	3 0 4 0 27 1491
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 3 <1 22 1657 320	0 0 2 0 20 1509 302	3 0 4 0 27 1491 306
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 3 <1 22 1657 320 394	0 0 2 0 20 1509 302 377	3 0 4 0 27 1491 306 405
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 3 <1 22 1657 320	0 0 2 0 20 1509 302	3 0 4 0 27 1491 306
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	limit/base	0 0 3 <1 22 1657 320 394 3753 current	0 0 2 0 20 1509 302 377 3340 history1	3 0 4 0 27 1491 306 405 3003 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m		0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145	0 0 2 0 20 1509 302 377 3340 history1 105	3 0 4 0 27 1491 306 405 3003 history2 17
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	limit/base	0 0 3 <1 22 1657 320 394 3753 <u>current</u> 145 2	0 0 2 0 20 1509 302 377 3340 history1 105 2	3 0 4 0 27 1491 306 405 3003 history2 17 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	limit/base	0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145	0 0 2 0 20 1509 302 377 3340 history1 105	3 0 4 0 27 1491 306 405 3003 history2 17
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base	0 0 3 <1 22 1657 320 394 3753 <u>current</u> 145 2 <1	0 0 2 0 20 1509 302 377 3340 history1 105 2 0 0 history1	3 0 4 0 27 1491 306 405 3003 history2 17 <1 1 1 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 ASTM D5185m	limit/base >200 >20 limit/base	0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145 2 <1 2 <1 <i>current</i> 0	0 0 2 2 0 20 1509 302 377 3340 history1 105 2 0 0 history1 0	3 0 4 0 27 1491 306 405 3003 history2 17 <1 1 1 history2 0
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 ASTM D5185m	limit/base >200 >20 limit/base	0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145 2 <1 145 2 <1 <i>current</i> 0 3.3	0 0 2 0 20 1509 302 377 3340 history1 105 2 0 history1 0 3.3	3 0 4 0 27 1491 306 405 3003 history2 17 <17 <1 1 1 history2 0 3.0
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 ASTM D5185m	limit/base >200 >20 limit/base	0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145 2 <1 2 <1 <i>current</i> 0	0 0 2 2 0 20 1509 302 377 3340 history1 105 2 0 0 history1 0	3 0 4 0 27 1491 306 405 3003 history2 17 <1 1 1 history2 0
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 ASTM D5185m	limit/base >200 >20 limit/base	0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145 2 <1 145 2 <1 <i>current</i> 0 3.3	0 0 2 0 20 1509 302 377 3340 history1 105 2 0 history1 0 3.3	3 0 4 0 27 1491 306 405 3003 history2 17 <17 <1 1 history2 0 3.0
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 ASTM D5185m	Imit/base >200 ≥20 Imit/base >20 ≥20 ≥20 ≥20 ≥20 ≥20 ≥20 ≥20 ≥30	0 0 3 <1 22 1657 320 394 3753 <u>current</u> 145 2 <1 <u>current</u> 0 3.3 16.6	0 0 2 2 0 20 1509 302 377 3340 history1 105 2 0 0 history1 0 3.3 15.6	3 0 4 0 27 1491 306 405 3003 history2 17 <1 1 1 history2 0 3.0 14.4
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 ASTM D7844 *ASTM D7624 *ASTM D7415	limit/base >200 >20 limit/base >20 >20 limit/base	0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145 2 <1 <i>tab</i> 2 <1 <i>current</i> 0 3.3 16.6	0 0 2 0 20 1509 302 377 3340 history1 105 2 0 history1 0 3.3 15.6 history1	3 0 4 0 27 1491 306 405 3003 history2 17 <17 <1 1 1 history2 0 3.0 14.4 history2
Boron 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 ASTM D7844 *ASTM D7624 *ASTM D7414	limit/base >200 >20 limit/base >20 limit/base >30 limit/base >25	0 0 3 <1 22 1657 320 394 3753 <i>current</i> 145 2 <1 <i>current</i> 0 3.3 16.6 <i>current</i>	0 0 2 2 0 20 1509 302 377 3340 history1 105 2 0 history1 0 3.3 15.6 history1 6.9	3 0 4 0 27 1491 306 405 3003 history2 17 <17 <1 1 1 history2 0 3.0 14.4 history2 6.8

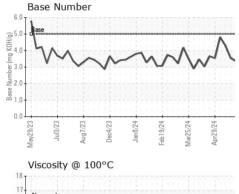
Contact/Location: CHIP MATHEWS - BLAHARMO

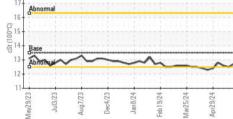


OIL ANALYSIS REPORT









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 PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.5	12.7	12.5	12.6
GRAPHS						
Iron (ppm)				Lead (ppm)		
Severe						1
			60			
Abnormal			튭.40			11
) -			20	Severe		
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May29/23 Jul3/23 Aug7/23 Dec4/23	Jan8/24	Feb 19/24 Mar25/24 Aor29/24		May29/23 Jul3/23 Aug7/23	Dec4/23 Jan8/24 Feb19/24	Mar25/24 Apr29/24
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Severe			5-	1333335555555	12002013	
5			4	Severe		
Abnormal			E ³ 2	Abnormal		
			2-2-	- o		
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May29/23 Jul3/23 Aug7/23 Dec4/23	Jan	Feb 19/24 Mar25/24 Aor29/24		May29/23 Jul3/23 Aug7/23	Dec4/23 Jan8/24 Feb19/24	Mar25/24 Apr29/24
Copper (ppm)			400	Silicon (ppm)		
Severe				Severe	A	
D <b>-</b>			300-		Λ	
- Abnormal			톱 200	Abnormal	1AAAA	ΛΛ.
			100-	WVV	· VVV	N V V
		$\sim$	<u> </u>	Li	Y	V
May29/23 Jul3/23 Aug7/23 Dec4/23	Jan 8/24	Feb 19/24 Mar25/24 Aor29/24		May29/23 Jul3/23 Aug7/23	Dec4/23 . Jan8/24 . Feb19/24	Mar25/24 Apr29/24
2	ηŝ	Fet Mar Aor		W	Da Ja Feb	Mai
Viscosity @ 100°C		********	6.0	Base Number		
Abnormal			(PHO) HOY E4.0 10 3.0 WW 2.0 8 8 1.0	ase		*
Here and the set			¥ 4.0	m	M	And
Abnormal			· · · · · · · · · · · · · · · · · · ·		V	v
2-			2.0° % 1.0			
	4	4 4 4 4 4 4	0.0		4 4	4 4
May29/23 Jul3/23 Aug7/23 Dec4/23	Jan8/24	Feb19/24 Mar25/24 Aor29/24		May29/23 Jul3/23 Aug7/23	Dec4/23 Jan8/24 Feb19/24	Mar25/24 Apr29/24
Mar Au De	ļ	Fel Ma		Ma J Au	Ja Feb	Ma
/earCheck USA - 501	l Madiso	n Ave Carv	, NC 27513			BLACK
		- , <b> ,</b>				

Laboratory OAK LACK 5054 HWY HH Sample No. : 12 Jun 2024 : WC0803470 Received Lab Number : 06207991 : 14 Jun 2024 HARTVILLE, MO Tested Unique Number : 11075452 Diagnosed : 14 Jun 2024 - Don Baldridge US 65667 Test Package : MOB 2 Contact: CHIP MATHEWS Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. chip.mattews@cubedistrictenergy.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Report Id: BLAHARMO [WUSCAR] 06207991 (Generated: 06/14/2024 20:03:21) Rev: 1

Contact/Location: CHIP MATHEWS - BLAHARMO

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