



# OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Machine Id  
**LGS00181**  
Component  
**Middle Biogas Engine**  
Fluid  
**CITGO PACEMAKER GAS ENGINE LFG LA 40 (--- GAL)**

## RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>WC0803404</b>	WC0803410	WC0803411
Sample Date		Client Info		<b>11 Mar 2024</b>	04 Mar 2024	26 Feb 2024
Machine Age	hrs	Client Info		<b>66058</b>	65893	65741
Oil Age	hrs	Client Info		<b>411</b>	245	95
Filter Age	hrs	Client Info		<b>411</b>	245	95
Oil Changed		Client Info		<b>N/A</b>	N/A	N/A
Filter Changed		Client Info		<b>N/A</b>	N/A	N/A
Sample Status				<b>ABNORMAL</b>	NORMAL	NORMAL

## WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>45	<b>9</b>	5	0
Chromium	ppm	ASTM D5185m	>2	<b>&lt;1</b>	0	<1
Nickel	ppm	ASTM D5185m	>2	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
Silver	ppm	ASTM D5185m	>5	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>10	<b>3</b>	1	1
Lead	ppm	ASTM D5185m	>5	<b>&lt;1</b>	0	0
Copper	ppm	ASTM D5185m	>14	<b>2</b>	<1	<1
Tin	ppm	ASTM D5185m	>13	<b>4</b>	2	2
Vanadium	ppm	ASTM D5185m		<b>0</b>	0	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

## CONTAMINATION

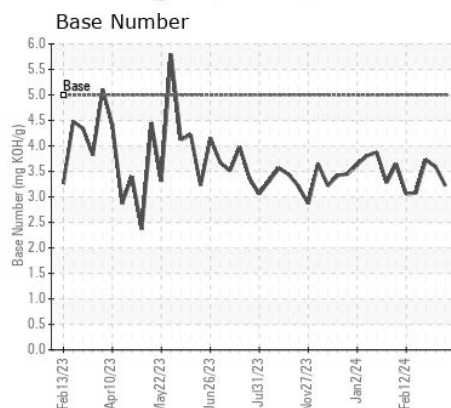
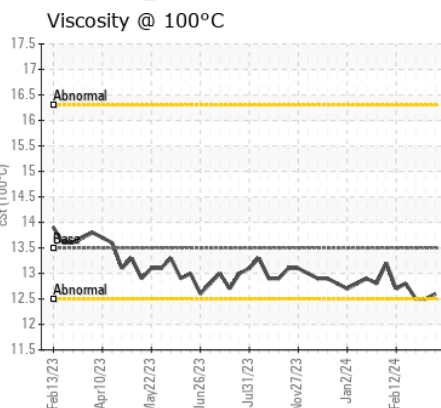
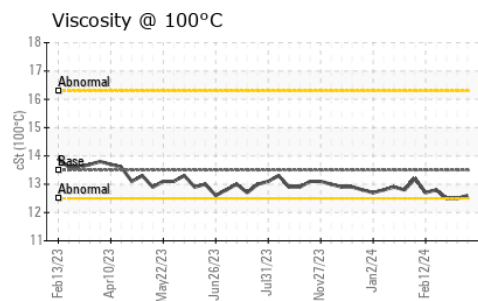
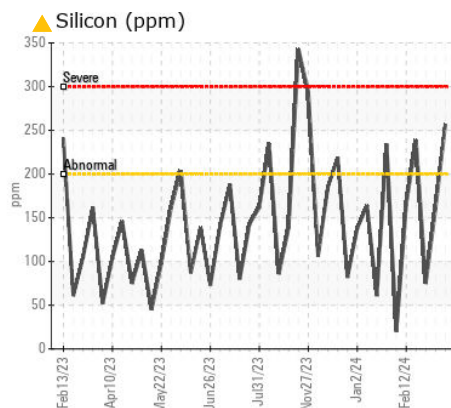
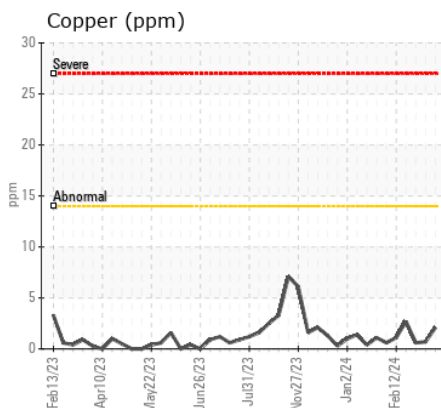
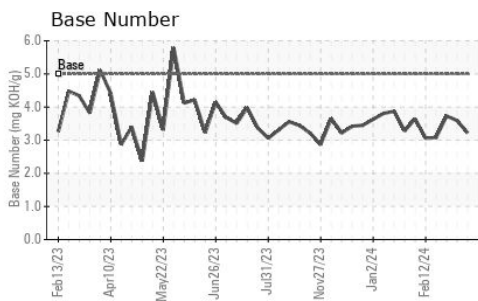
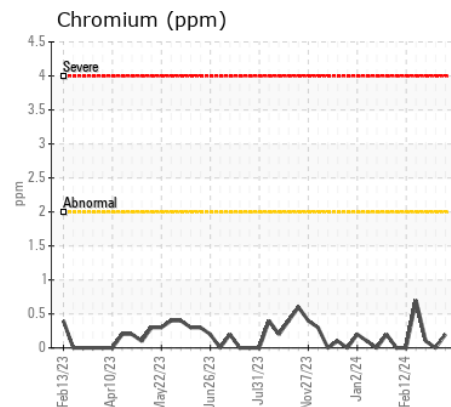
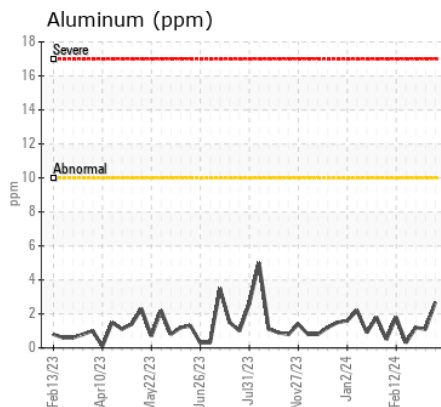
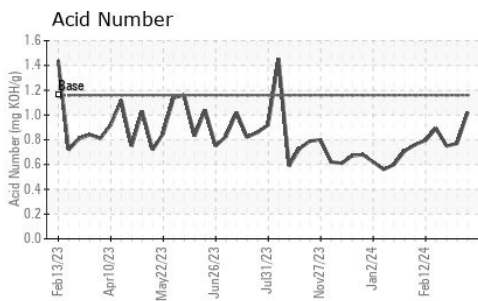
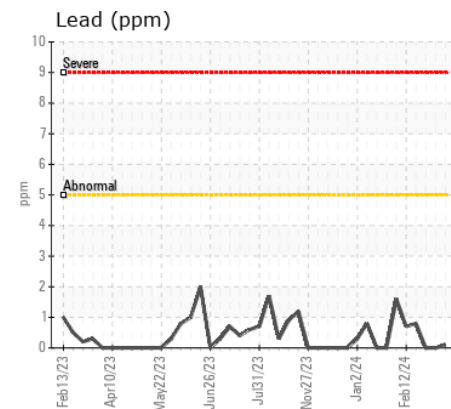
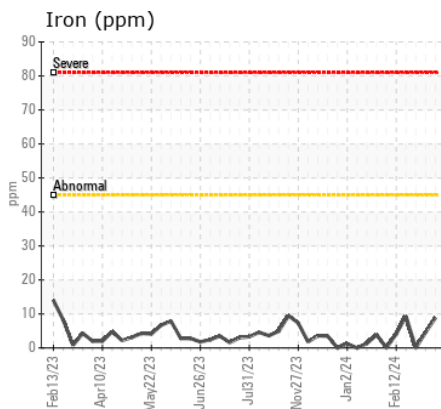
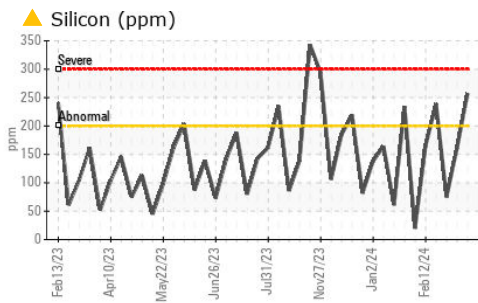
Elemental level of silicon (Si) above normal.

Silicon	ppm	ASTM D5185m	>200	<b>▲ 257</b>	161	75
Potassium	ppm	ASTM D5185m	>20	<b>1</b>	0	<1
Fuel		WC Method	>4.0	<b>&lt;1.0</b>	<1.0	<1.0
Water		WC Method	>0.1	<b>NEG</b>	NEG	NEG
Glycol		WC Method		<b>NEG</b>	NEG	NEG
Soot %	%	*ASTM D7844		<b>0</b>	0	0
Nitration	Abs/cm	*ASTM D7624	>20	<b>3.4</b>	3.2	3.2
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>17.1</b>	16.4	15.1
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	<b>NEG</b>	NEG	NEG

## 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.

Sodium	ppm	ASTM D5185m		<b>0</b>	<1	<1
Boron	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Barium	ppm	ASTM D5185m		<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m		<b>4</b>	1	<1
Manganese	ppm	ASTM D5185m		<b>0</b>	0	<1
Magnesium	ppm	ASTM D5185m		<b>44</b>	11	14
Calcium	ppm	ASTM D5185m		<b>1494</b>	1479	1307
Phosphorus	ppm	ASTM D5185m		<b>350</b>	287	278
Zinc	ppm	ASTM D5185m		<b>396</b>	345	342
Sulfur	ppm	ASTM D5185m		<b>3308</b>	2884	2512
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>7.3</b>	7.0	6.9
Acid Number (AN)	mg KOH/g	ASTM D8045	1.16	<b>1.02</b>	0.77	0.75
Base Number (BN)	mg KOH/g	ASTM D2896	5	<b>3.22</b>	3.59	3.73
Visc @ 100°C	cSt	ASTM D445	13.5	<b>12.6</b>	12.5	12.5



Certificate L2367

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

**Sample No.** : WC0803404

**Lab Number** : 06121734

**Unique Number** : 10930567

**Test Package** : MOB 2

**Received** : 18 Mar 2024

**Tested** : 19 Mar 2024

**Diagnosed** : 21 Mar 2024 - Sean Felton

**BLACK OAK**

5054 HWY HH

HARTVILLE, MO

US 65667

Contact: CHIP MATHEWS

chip.matthews@cubedistrictenergy.com

T:

F:

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)