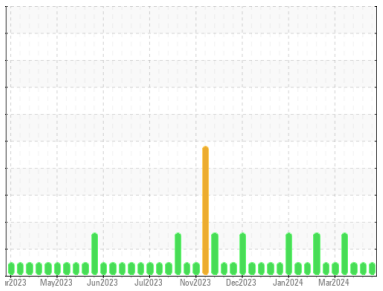
OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Machine Id
LGS00181
Component
Middle Biogas Engine
Fluid
CITGO PACEMAKER GAS ENGINE LFG LA 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		**WC0803405**	WC0803408	WC0803409
Sample Date		Client Info		**01 Apr 2024**	25 Mar 2024	19 Mar 2024
Machine Age	hrs	Client Info		**66547**	66383	66246
Oil Age	hrs	Client Info		**327**	163	26
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**NORMAL**	NORMAL	NORMAL

CONTAMINATION		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**	8	2
Chromium	ppm	ASTM D5185m	>2	**0**	<1	0
Nickel	ppm	ASTM D5185m	>2	**<1**	1	0
Titanium	ppm	ASTM D5185m		**0**	<1	0
Silver	ppm	ASTM D5185m	>5	**0**	0	0
Aluminum	ppm	ASTM D5185m	>10	**2**	2	<1
Lead	ppm	ASTM D5185m	>5	**1**	1	0
Copper	ppm	ASTM D5185m	>14	**1**	3	<1
Tin	ppm	ASTM D5185m	>13	**4**	4	1
Vanadium	ppm	ASTM D5185m		**0**	<1	0
Cadmium	ppm	ASTM D5185m		**0**	<1	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**<1**	3	1
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**<1**	8	2
Manganese	ppm	ASTM D5185m		**<1**	<1	<1
Magnesium	ppm	ASTM D5185m		**10**	26	24
Calcium	ppm	ASTM D5185m		**1403**	1464	1411
Phosphorus	ppm	ASTM D5185m		**287**	322	302
Zinc	ppm	ASTM D5185m		**346**	368	351
Sulfur	ppm	ASTM D5185m		**3471**	3150	2789

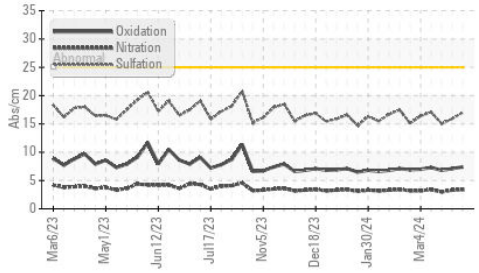
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>200	**197**	136	49
Sodium	ppm	ASTM D5185m		**7**	<1	<1
Potassium	ppm	ASTM D5185m	>20	**7**	2	0

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0**	0	0
Nitration	Abs/cm	*ASTM D7624	>20	**3.4**	3.3	3.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	**17.0**	15.9	15.0

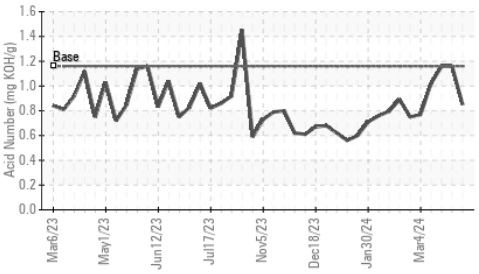
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**7.4**	7.1	6.8
Acid Number (AN)	mg KOH/g	ASTM D8045	1.16	**0.85**	1.16	1.159
Base Number (BN)	mg KOH/g	ASTM D2896	5	**2.90**	3.50	4.18

OIL ANALYSIS REPORT

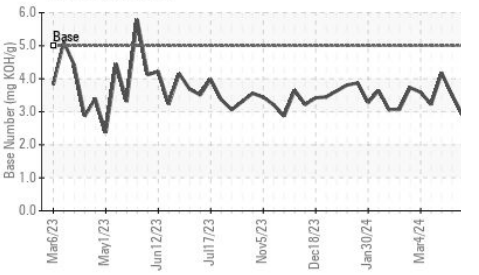
FT-IR (Direct Trend)



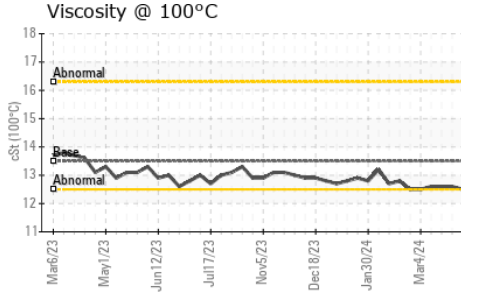
Acid Number



Base Number



Viscosity @ 100°C

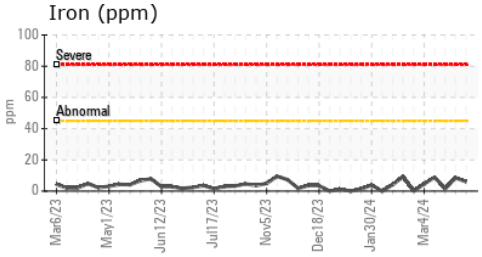


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

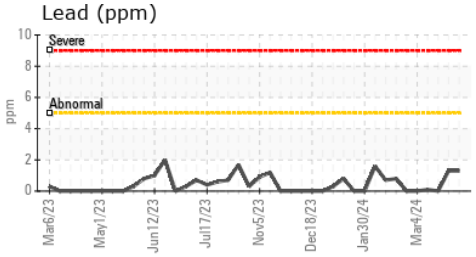
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.5	**12.5**	12.6	12.6

GRAPHS

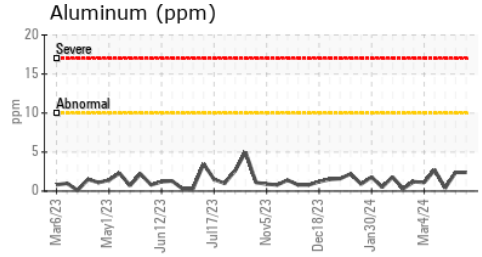
Iron (ppm)



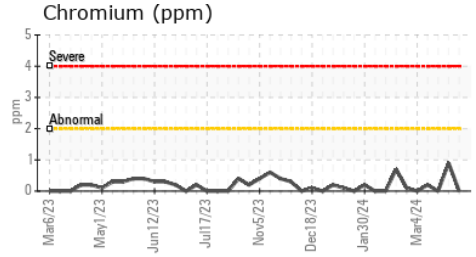
Lead (ppm)



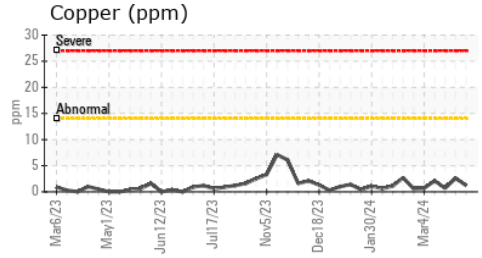
Aluminum (ppm)



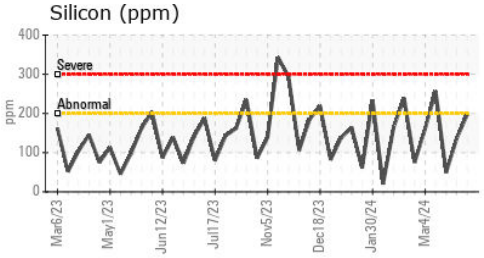
Chromium (ppm)



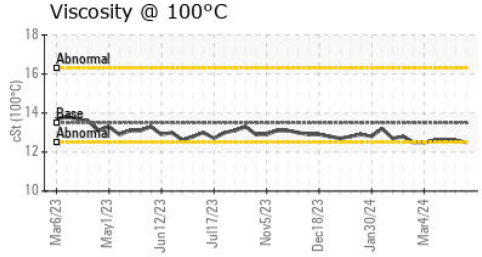
Copper (ppm)



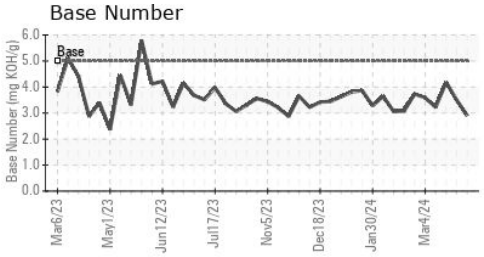
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0803405
Lab Number : 06139346
Unique Number : 10964154
Test Package : MOB 2

Received : 04 Apr 2024
Tested : 05 Apr 2024
Diagnosed : 06 Apr 2024 - Don Baldridge

BLACK OAK
5054 HWY HH
HARTVILLE, MO
US 65667
Contact: CHIP MATHEWS
chip.mattews@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)