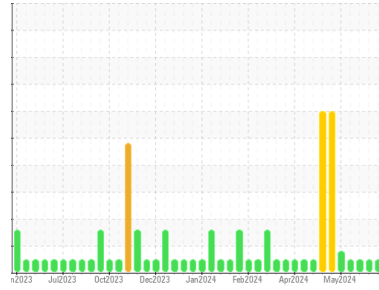




OIL ANALYSIS REPORT

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			WC0803414	WC0803470	WC0803469
Sample Date	Client Info			17 Jun 2024	11 Jun 2024	03 Jun 2024
Machine Age	hrs	Client Info		67695	67544	67377
Oil Age	hrs	Client Info		453	394	136
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	8	6	2
Chromium	ppm	ASTM D5185m	>2	<1	<1	0
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>10	<1	1	<1
Lead	ppm	ASTM D5185m	>5	<1	<1	0
Copper	ppm	ASTM D5185m	>14	2	2	<1
Tin	ppm	ASTM D5185m	>13	3	2	<1
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		2	0	0
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		3	3	2
Manganese	ppm	ASTM D5185m		<1	<1	0
Magnesium	ppm	ASTM D5185m		26	22	20
Calcium	ppm	ASTM D5185m		1490	1657	1509
Phosphorus	ppm	ASTM D5185m		294	320	302
Zinc	ppm	ASTM D5185m		364	394	377
Sulfur	ppm	ASTM D5185m		3557	3753	3340

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>200	197	145	105
Sodium	ppm	ASTM D5185m		3	2	2
Potassium	ppm	ASTM D5185m	>20	0	<1	0

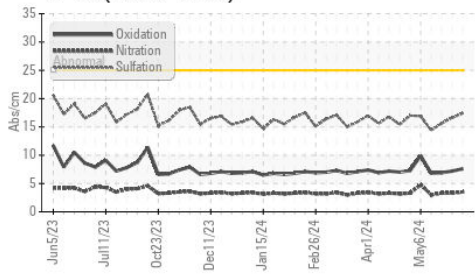
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		0	0	0
Nitration	Abs/cm	*ASTM D7624	>20	3.5	3.3	3.3
Sulfation	Abs/.1mm	*ASTM D7415	>30	17.4	16.6	15.6

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	7.6	7.2	6.9
Acid Number (AN)	mg KOH/g	ASTM D8045	1.16	0.86	0.84	0.86
Base Number (BN)	mg KOH/g	ASTM D2896	5	2.92	3.35	3.55

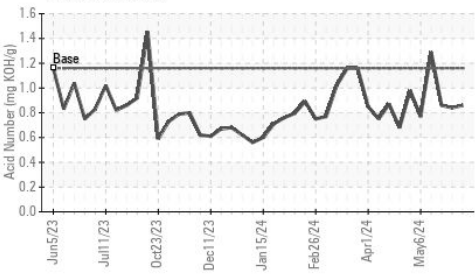


OIL ANALYSIS REPORT

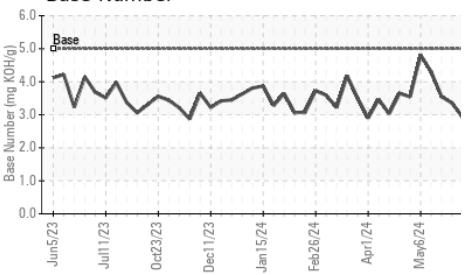
FT-IR (Direct Trend)



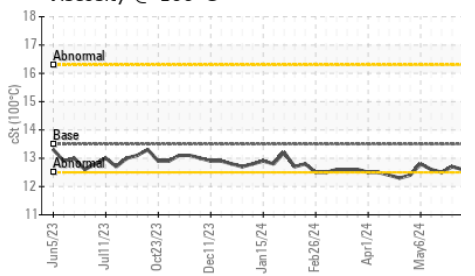
Acid Number



Base Number



Viscosity @ 100°C

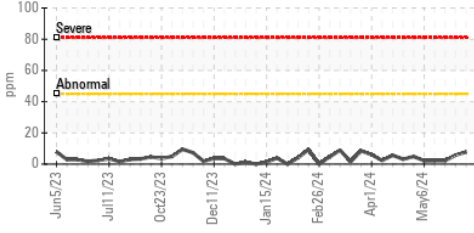


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

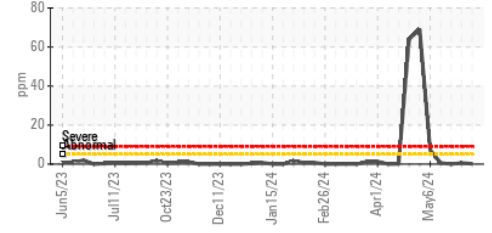
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.5	12.6	12.7

GRAPHS

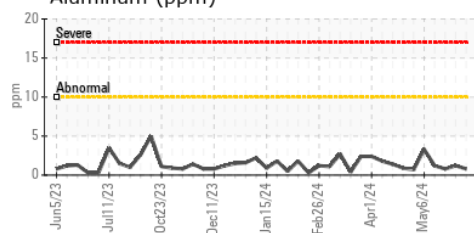
Iron (ppm)



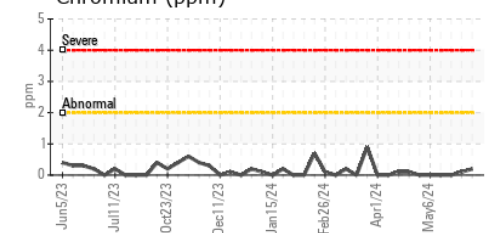
Lead (ppm)



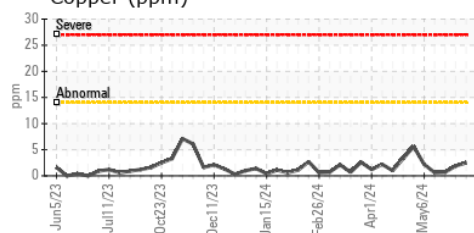
Aluminum (ppm)



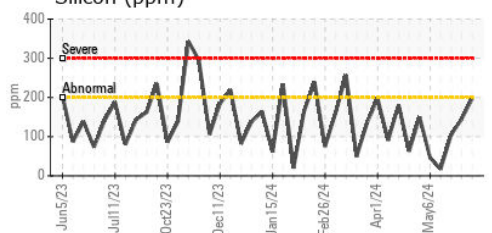
Chromium (ppm)



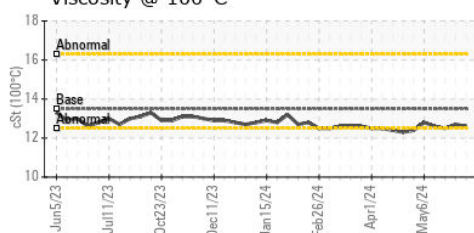
Copper (ppm)



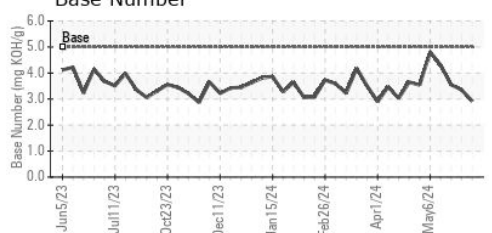
Silicon (ppm)



Viscosity @ 100°C



Base Number



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0803414 **Received** : 20 Jun 2024
Lab Number : 06215913 **Tested** : 22 Jun 2024
Unique Number : 11088777 **Diagnosed** : 23 Jun 2024 - Don Baldrige
Test Package : MOB 2

BLACK OAK
 5054 HWY HH
 HARTVILLE, MO
 US 65667
 Contact: CHIP MATHEWS
 chip.matthews@cubedistrictenergy.com

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)