



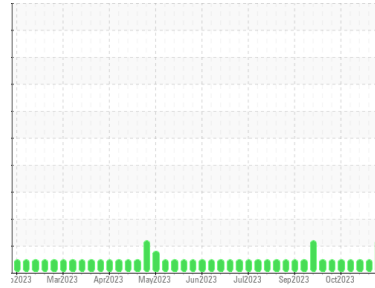
OIL ANALYSIS REPORT

Sample Rating Trend

DEGRADATION



Machine Id
CATERPILLAR GM01 - DA LUBRICANT BLUE FLAME HB-5 SAE 40 (S/N LGS00177)
 Component
Biogas Engine
 Fluid
D-A Lubricant Blue Flame HB-5 40W (140 GAL)



DIAGNOSIS

▲ Recommendation

The oil is near the end of its useful service life, recommend schedule an oil change. 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 level is low. The AN level is acceptable for this fluid.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0760113	WC0760112	WC0760111
Sample Date	Client Info		30 Oct 2023	23 Oct 2023	16 Oct 2023
Machine Age	hrs	Client Info	75603	75441	75276
Oil Age	hrs	Client Info	884	717	552
Oil Changed	Client Info		Not Chngd	Not Chngd	Not Chngd
Sample Status			ABNORMAL	NORMAL	NORMAL

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 >45	11	4	3
Chromium	ppm	ASTM D5185m >2	<1	<1	0
Nickel	ppm	ASTM D5185m >2	<1	0	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	0	0
Copper	ppm	ASTM D5185m >14	2	<1	2
Tin	ppm	ASTM D5185m >13	1	1	1
Vanadium	ppm	ASTM D5185m	0	0	0
Cadmium	ppm	ASTM D5185m	0	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	7	3	2
Barium	ppm	ASTM D5185m	0	0	0
Molybdenum	ppm	ASTM D5185m	3	4	4
Manganese	ppm	ASTM D5185m	1	<1	0
Magnesium	ppm	ASTM D5185m	13	17	19
Calcium	ppm	ASTM D5185m	1630	1500	1466
Phosphorus	ppm	ASTM D5185m	329	280	262
Zinc	ppm	ASTM D5185m	417	365	321
Sulfur	ppm	ASTM D5185m	3900	3244	2840

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >200	116	107	93
Sodium	ppm	ASTM D5185m	<1	3	2
Potassium	ppm	ASTM D5185m >20	0	<1	0

INFRA-RED

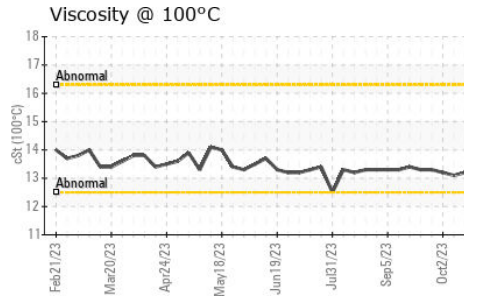
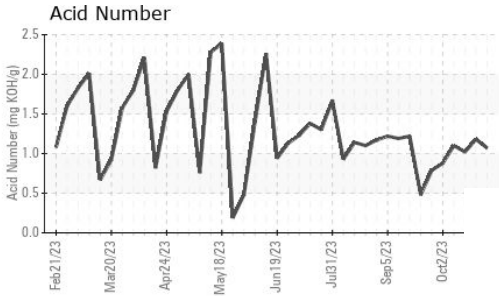
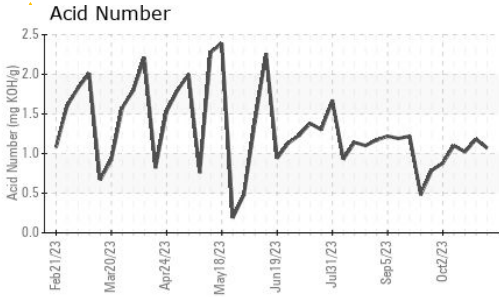
	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	0	0	0
Nitration	Abs/cm	*ASTM D7624 >20	4.3	4.3	4.1
Sulfation	Abs/.1mm	*ASTM D7415 >30	19.7	19.6	19.0

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	9.7	9.7	9.5
Acid Number (AN)	mg KOH/g	ASTM D8045	1.07	1.18	1.02
Base Number (BN)	mg KOH/g	ASTM D2896	▲ 2.16	3.14	3.73



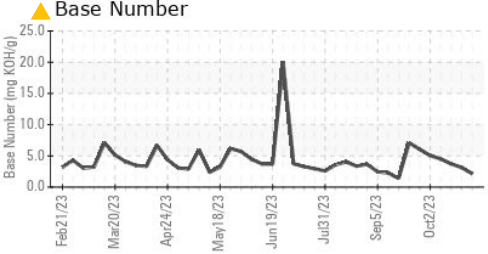
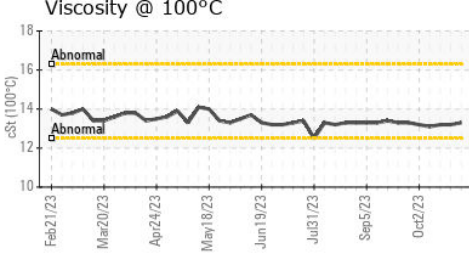
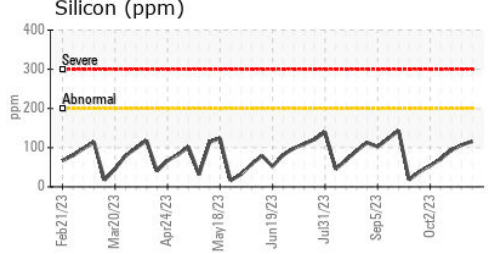
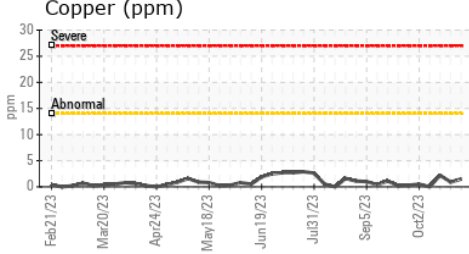
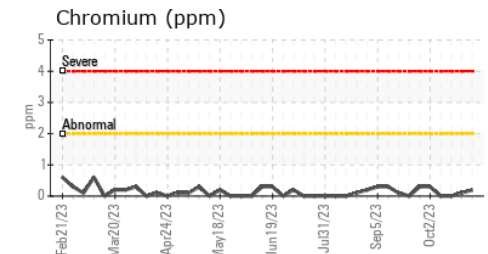
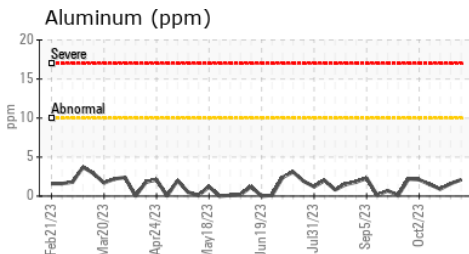
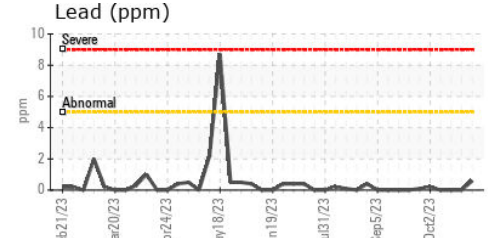
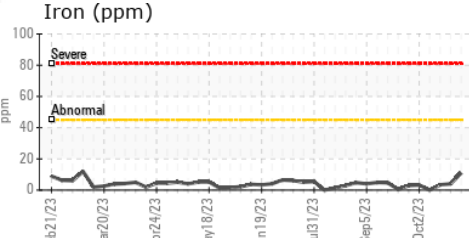
OIL ANALYSIS REPORT



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	13.3	13.2	13.2

GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0760113 **Received** : 31 Oct 2023
Lab Number : 05995099 **Diagnosed** : 08 Nov 2023
Unique Number : 10723459 **Diagnostician** : Jonathan Hester
Test Package : MOB 2

ONSLow
 465 MEADOWVIEW RD
 JACKSONVILLE, NC
 US 28540
 Contact: THOMAS BURTON
 thomas.burton@cubedistrictenergy.com
 T:
 F:

Certificate L2367
 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)