



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL



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)

RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0880160	WC0880159	WC0880158
Sample Date		Client Info		15 Apr 2024	08 Apr 2024	07 Apr 2024
Machine Age	hrs	Client Info		79397	79234	79232
Oil Age	hrs	Client Info		164	1	1008
Filter Age	hrs	Client Info		164	1	1008
Oil Changed		Client Info		Not Changed	Changed	Not Changed
Filter Changed		Client Info		Not Changed	Changed	Not Changed
Sample Status				NORMAL	NORMAL	ABNORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>45	5	<1	9
Chromium	ppm	ASTM D5185m	>2	0	0	0
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m		1	<1	1
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>10	2	<1	1
Lead	ppm	ASTM D5185m	>5	0	0	0
Copper	ppm	ASTM D5185m	>14	7	0	8
Tin	ppm	ASTM D5185m	>13	1	<1	3
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

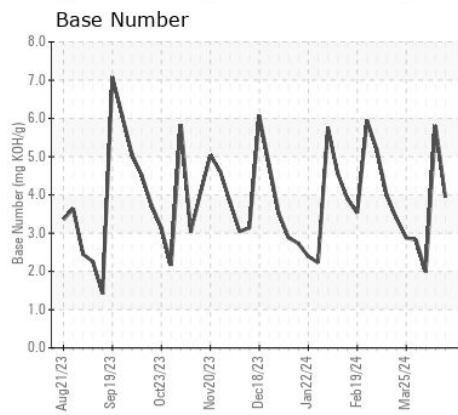
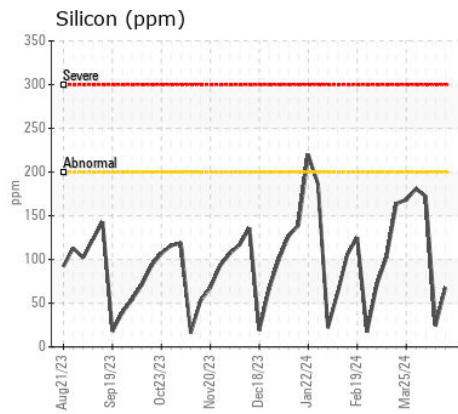
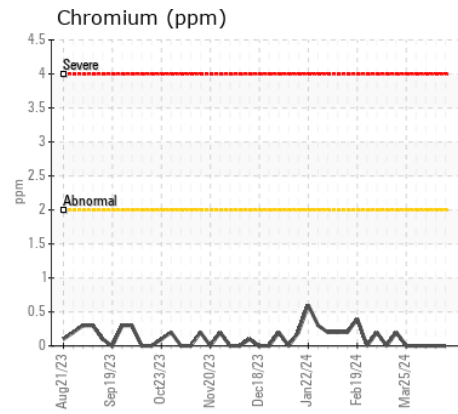
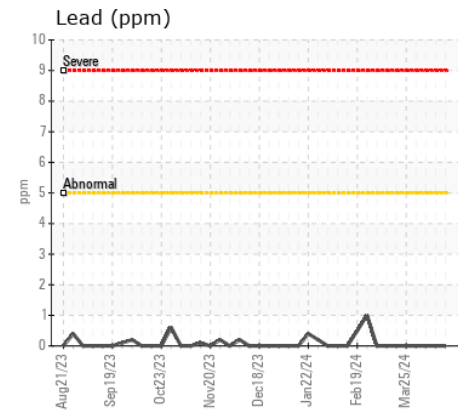
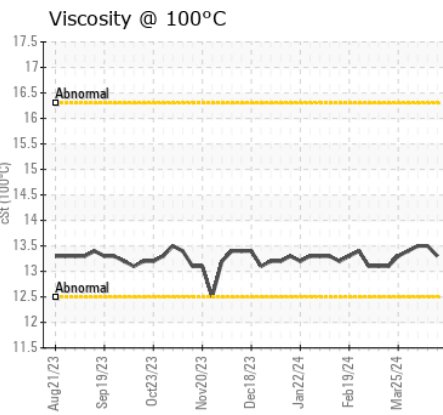
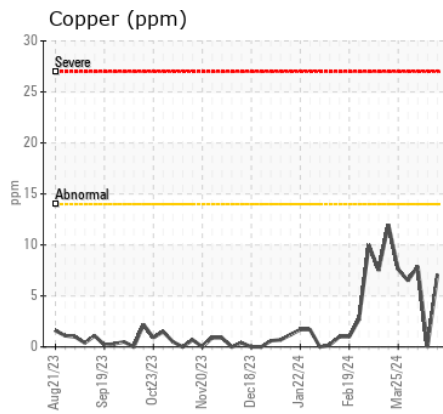
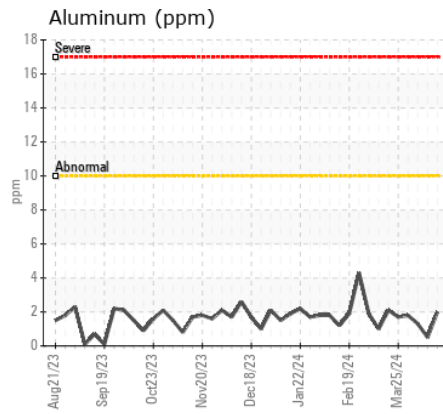
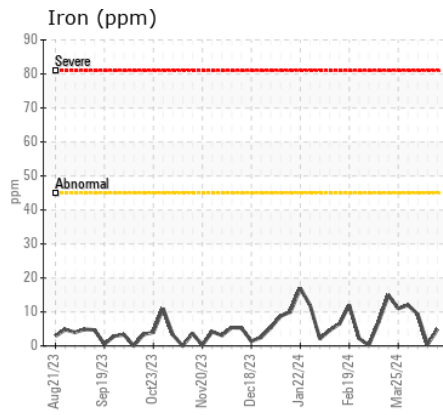
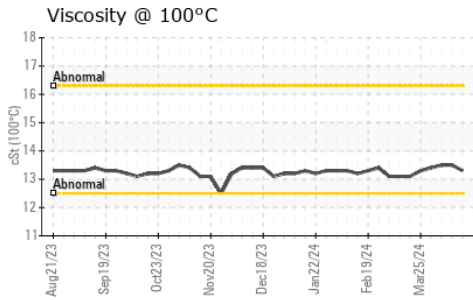
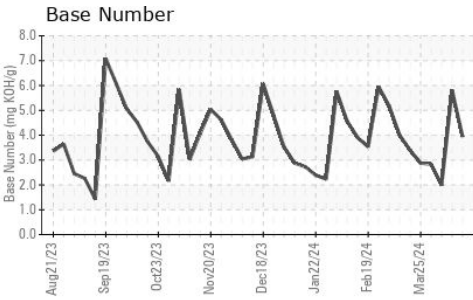
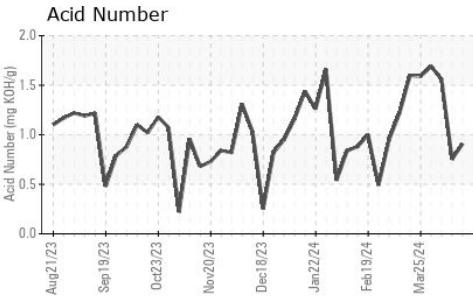
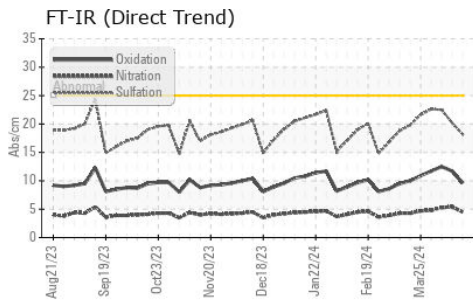
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>200	68	24	172
Potassium	ppm	ASTM D5185m	>20	1	0	0
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
Soot %	%	*ASTM D7844		0	0	0
Nitration	Abs/cm	*ASTM D7624	>20	4.5	5.4	5.3
Sulfation	Abs/.1mm	*ASTM D7415	>30	18.2	20.2	22.5
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

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 acceptable for the time in service.

Sodium	ppm	ASTM D5185m		3	2	2
Boron	ppm	ASTM D5185m		4	4	2
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		2	1	2
Manganese	ppm	ASTM D5185m		1	<1	<1
Magnesium	ppm	ASTM D5185m		15	11	12
Calcium	ppm	ASTM D5185m		1770	1662	1691
Phosphorus	ppm	ASTM D5185m		319	282	266
Zinc	ppm	ASTM D5185m		383	347	349
Sulfur	ppm	ASTM D5185m		4443	2534	3906
Oxidation	Abs/.1mm	*ASTM D7414	>25	9.6	11.7	12.5
Acid Number (AN)	mg KOH/g	ASTM D8045		0.91	0.752	1.56
Base Number (BN)	mg KOH/g	ASTM D2896		3.94	5.81	▲ 1.99
Visc @ 100°C	cSt	ASTM D445		13.3	13.5	13.5



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0880160
Lab Number : 06150586
Unique Number : 10980664
Test Package : MOB 2

Received : 16 Apr 2024
Tested : 17 Apr 2024
Diagnosed : 18 Apr 2024 - Sean Felton

ONSLow
 465 MEADOWVIEW RD
 JACKSONVILLE, NC
 US 28540

Contact: THOMAS BURTON
 thomas.burton@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)

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