



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL



Machine Id
CATERPILLAR GM02
Component
Biogas Engine
Fluid
D-A Lubricant Blue Flame HB-5 40W (--- GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0870552	WC0870551	WC0870553
Sample Date		Client Info		01 Jul 2024	24 Jun 2024	21 Jun 2024
Machine Age	hrs	Client Info		69089	68936	68866
Oil Age	hrs	Client Info		248	95	25
Filter Age	hrs	Client Info		248	95	25
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>45	12	8	20
Chromium	ppm	ASTM D5185m	>2	0	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>10	2	2	2
Lead	ppm	ASTM D5185m	>5	0	0	2
Copper	ppm	ASTM D5185m	>14	<1	<1	<1
Tin	ppm	ASTM D5185m	>13	2	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

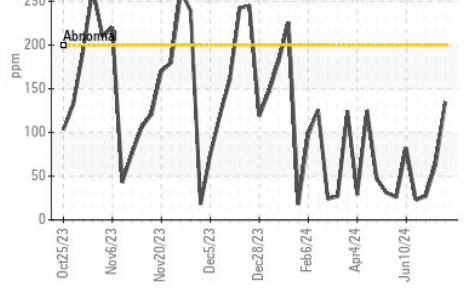
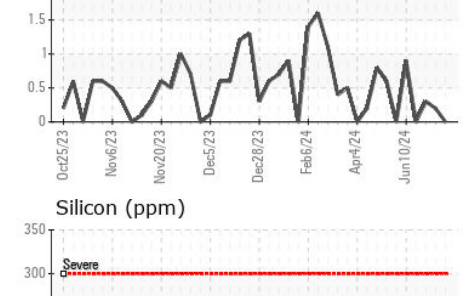
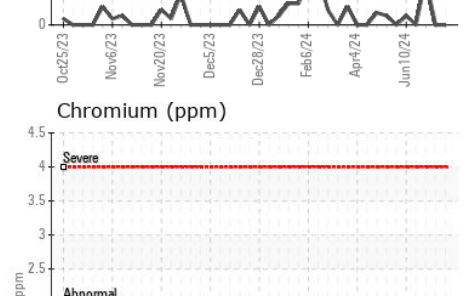
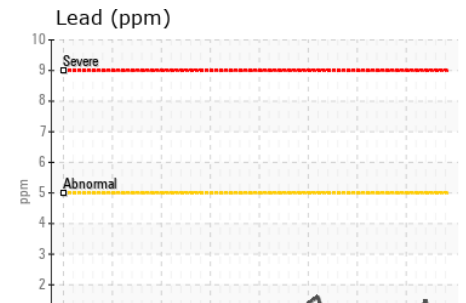
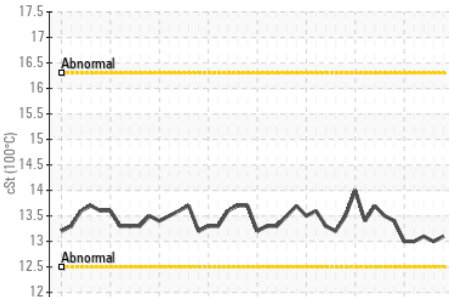
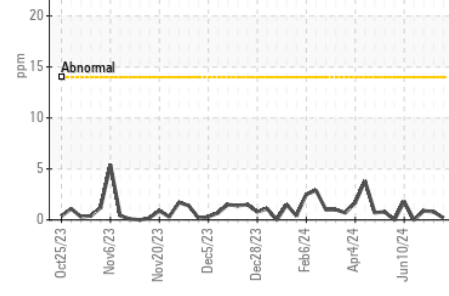
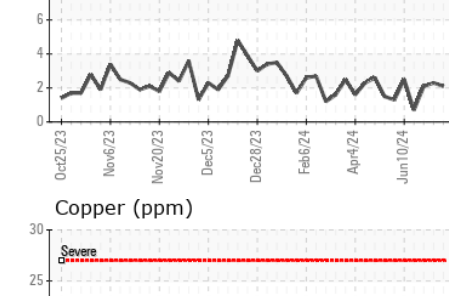
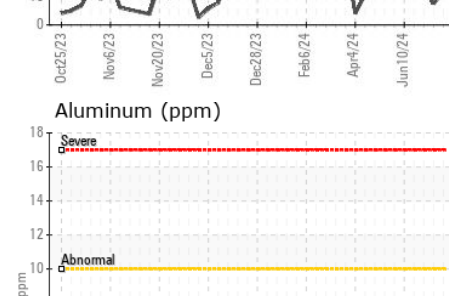
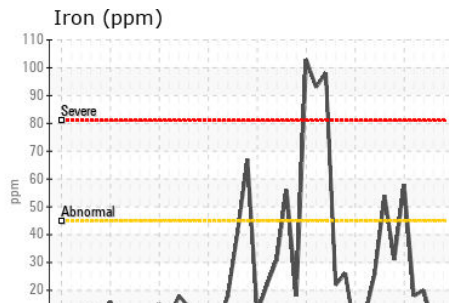
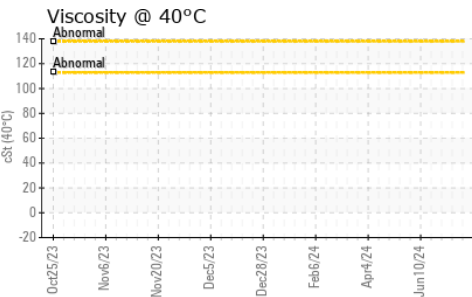
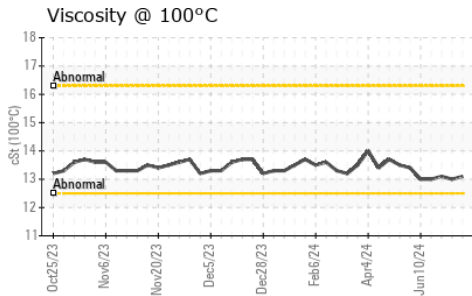
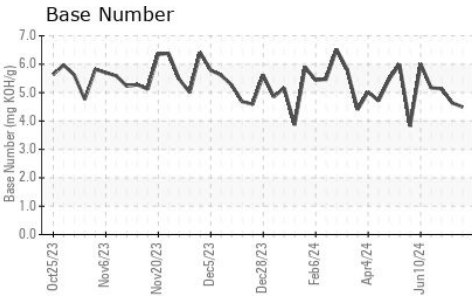
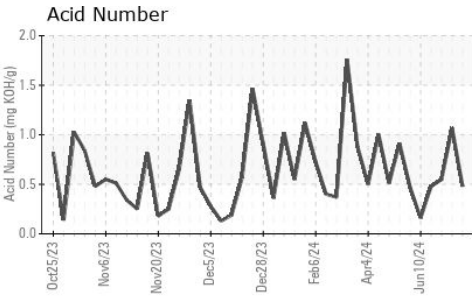
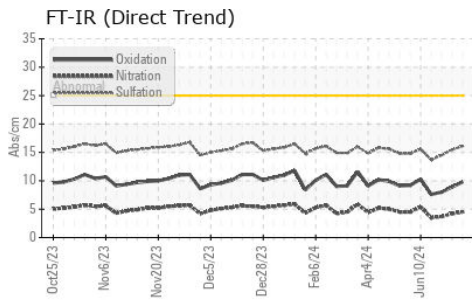
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>200	135	63	27
Potassium	ppm	ASTM D5185m	>20	<1	1	3
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	4.2	3.7
Sulfation	Abs/.1mm	*ASTM D7415	>30	16.1	15.5	14.5
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 suitable for further service.

Sodium	ppm	ASTM D5185m		2	0	1
Boron	ppm	ASTM D5185m		9	10	10
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		3	4	5
Manganese	ppm	ASTM D5185m		<1	0	<1
Magnesium	ppm	ASTM D5185m		35	31	33
Calcium	ppm	ASTM D5185m		1388	1272	1397
Phosphorus	ppm	ASTM D5185m		350	301	345
Zinc	ppm	ASTM D5185m		422	423	421
Sulfur	ppm	ASTM D5185m		3151	2532	3171
Oxidation	Abs/.1mm	*ASTM D7414	>25	9.8	8.9	8.0
Acid Number (AN)	mg KOH/g	ASTM D8045		0.48	1.07	0.55
Base Number (BN)	mg KOH/g	ASTM D2896		4.49	4.64	5.13
Visc @ 100°C	cSt	ASTM D445		13.1	13.0	13.1



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0870552 **Received** : 02 Jul 2024
Lab Number : 06226435 **Tested** : 05 Jul 2024
Unique Number : 11109928 **Diagnosed** : 05 Jul 2024 - Don Baldridge
Test Package : MOB 2 (Additional Tests: KV40)

OAK GROVE KS
 1150 E 700TH AVE
 ARCADIA, KS
 US 66711

Contact: KALEB WEAVER
 kaleb.weaver@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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 F: