



# 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		<b>WC0870549</b>	WC0870548	WC0870547
Sample Date		Client Info		<b>17 Jun 2024</b>	10 Jun 2024	04 Jun 2024
Machine Age	hrs	Client Info		<b>68863</b>	68772	68635
Oil Age	hrs	Client Info		<b>22</b>	148	12
Filter Age	hrs	Client Info		<b>22</b>	148	12
Oil Changed		Client Info		<b>N/A</b>	N/A	Changed
Filter Changed		Client Info		<b>N/A</b>	N/A	Changed
Sample Status				<b>NORMAL</b>	ABNORMAL	NORMAL

## WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>45	<b>18</b>	▲ 58	31
Chromium	ppm	ASTM D5185m	>2	<b>0</b>	<1	0
Nickel	ppm	ASTM D5185m	>2	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m		<b>0</b>	<1	0
Silver	ppm	ASTM D5185m	>5	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>10	<b>&lt;1</b>	2	1
Lead	ppm	ASTM D5185m	>5	<b>0</b>	<1	0
Copper	ppm	ASTM D5185m	>14	<b>0</b>	2	0
Tin	ppm	ASTM D5185m	>13	<b>0</b>	1	0
Vanadium	ppm	ASTM D5185m		<b>0</b>	0	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

## CONTAMINATION

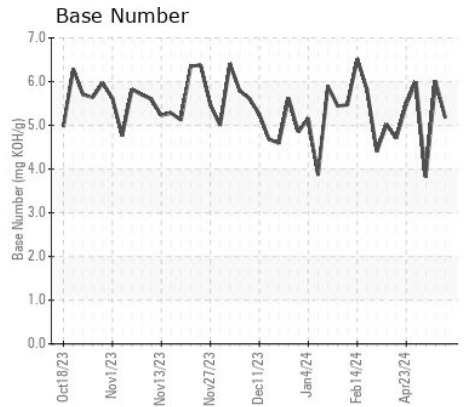
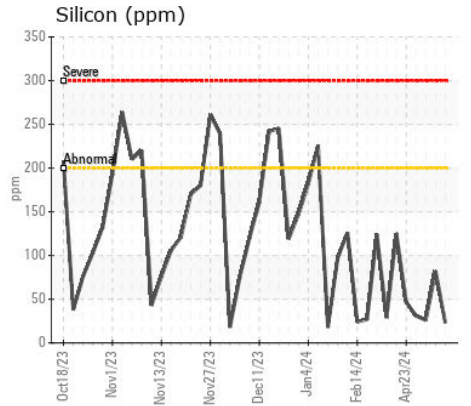
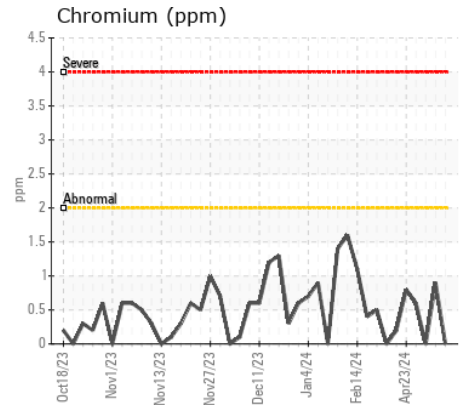
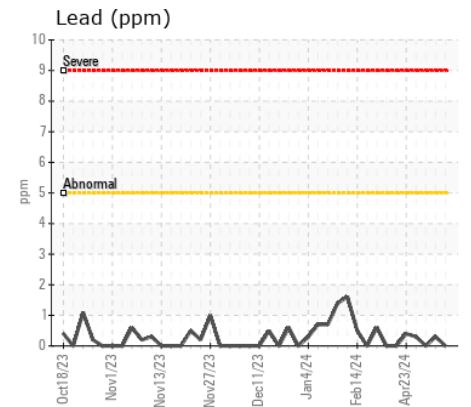
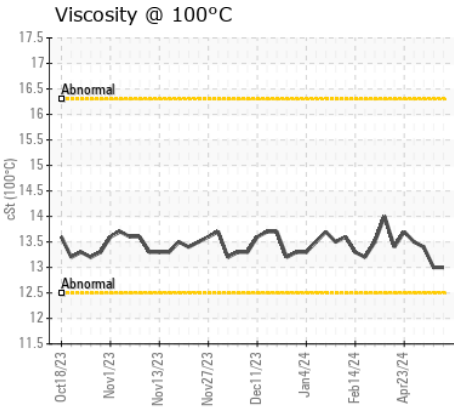
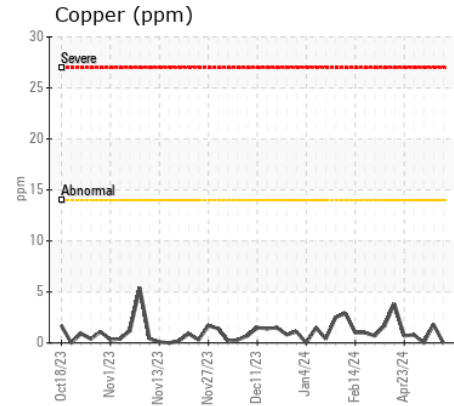
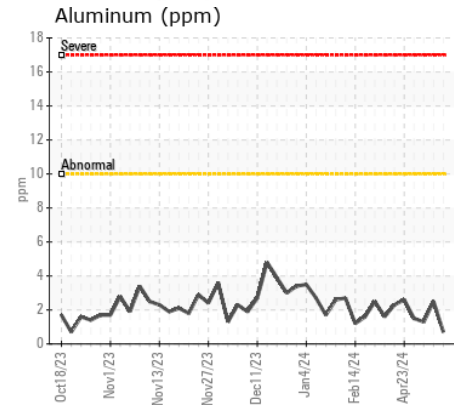
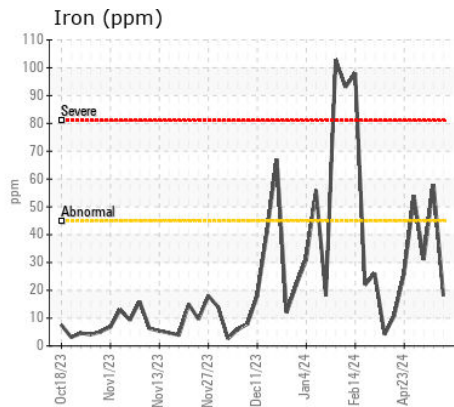
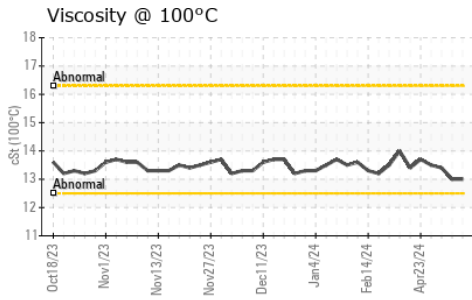
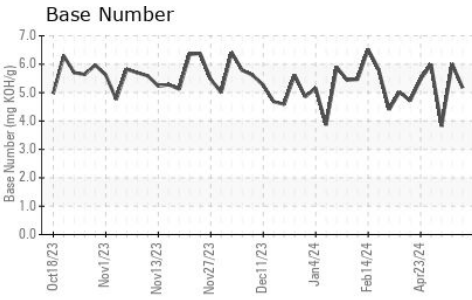
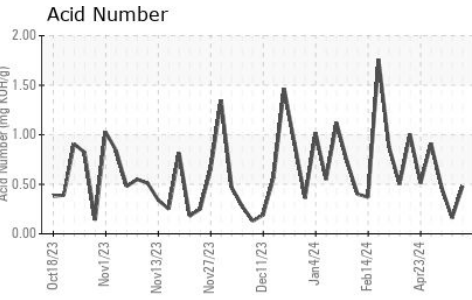
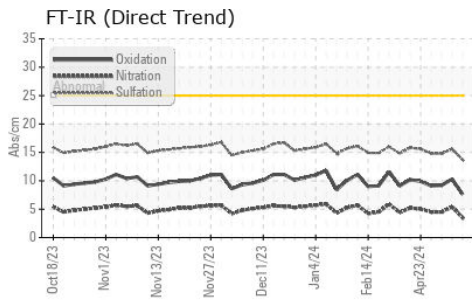
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>200	<b>23</b>	82	26
Potassium	ppm	ASTM D5185m	>20	<b>0</b>	1	0
Fuel		WC Method	>4.0	<b>&lt;1.0</b>	<1.0	<1.0
Water		WC Method	>0.1	<b>NEG</b>	NEG	NEG
Glycol		WC Method		<b>NEG</b>	NEG	NEG
Soot %	%	*ASTM D7844		<b>0</b>	0.1	0
Nitration	Abs/cm	*ASTM D7624	>20	<b>3.5</b>	5.4	4.5
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>13.7</b>	15.6	14.8
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	<b>NEG</b>	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		<b>&lt;1</b>	0	<1
Boron	ppm	ASTM D5185m		<b>7</b>	2	0
Barium	ppm	ASTM D5185m		<b>0</b>	0	<1
Molybdenum	ppm	ASTM D5185m		<b>4</b>	<1	0
Manganese	ppm	ASTM D5185m		<b>0</b>	<1	<1
Magnesium	ppm	ASTM D5185m		<b>32</b>	7	3
Calcium	ppm	ASTM D5185m		<b>1397</b>	1435	1417
Phosphorus	ppm	ASTM D5185m		<b>330</b>	395	366
Zinc	ppm	ASTM D5185m		<b>400</b>	477	437
Sulfur	ppm	ASTM D5185m		<b>2924</b>	2350	2159
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>7.6</b>	10.3	9.2
Acid Number (AN)	mg KOH/g	ASTM D8045		<b>0.48</b>	0.16	0.47
Base Number (BN)	mg KOH/g	ASTM D2896		<b>5.17</b>	6.01	3.82
Visc @ 100°C	cSt	ASTM D445		<b>13.0</b>	13.0	13.4



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC0870549  
**Lab Number** : 06213656  
**Unique Number** : 11086520  
**Test Package** : MOB 2

**Received** : 18 Jun 2024  
**Tested** : 20 Jun 2024  
**Diagnosed** : 20 Jun 2024 - Sean Felton

**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)

T:  
 F: