

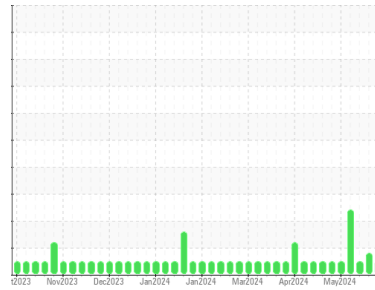


# OIL ANALYSIS REPORT



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)**

Sample Rating Trend



**NORMAL**



## 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		<b>WC0880167</b>	WC0880166	WC0880165
Sample Date	Client Info		<b>11 Jun 2024</b>	28 May 2024	20 May 2024
Machine Age	hrs	Client Info	<b>80484</b>	80412	80224
Oil Age	hrs	Client Info	<b>1</b>	352	164
Oil Changed	Client Info		<b>Changed</b>	Not Changd	Changed
Sample Status			<b>NORMAL</b>	MARGINAL	NORMAL

## CONTAMINATION

	method	limit/base	current	history1	history2
Water	WC Method	>0.1	<b>NEG</b>	NEG	NEG
Glycol	WC Method		<b>NEG</b>	NEG	NEG

## WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>45	<b>8</b>	▲ 43	14
Chromium	ppm	ASTM D5185m	>2	<b>0</b>	2	1
Nickel	ppm	ASTM D5185m	>2	<b>0</b>	1	<1
Titanium	ppm	ASTM D5185m		<b>0</b>	2	2
Silver	ppm	ASTM D5185m	>5	<b>0</b>	0	<1
Aluminum	ppm	ASTM D5185m	>10	<b>1</b>	3	2
Lead	ppm	ASTM D5185m	>5	<b>&lt;1</b>	<1	<1
Copper	ppm	ASTM D5185m	>14	<b>&lt;1</b>	5	3
Tin	ppm	ASTM D5185m	>13	<b>0</b>	3	2
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Cadmium	ppm	ASTM D5185m		<b>0</b>	<1	<1

## ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		<b>&lt;1</b>	7	5
Barium	ppm	ASTM D5185m		<b>0</b>	1	0
Molybdenum	ppm	ASTM D5185m		<b>3</b>	4	3
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m		<b>22</b>	18	13
Calcium	ppm	ASTM D5185m		<b>1479</b>	2608	1737
Phosphorus	ppm	ASTM D5185m		<b>372</b>	489	331
Zinc	ppm	ASTM D5185m		<b>471</b>	577	378
Sulfur	ppm	ASTM D5185m		<b>3612</b>	6366	4416

## CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>200	<b>8</b>	158	75
Sodium	ppm	ASTM D5185m		<b>&lt;1</b>	1	0
Potassium	ppm	ASTM D5185m	>20	<b>1</b>	2	1
Fuel	%	ASTM D3524	>4.0	<b>&lt;1.0</b>	<1.0	<1.0

## INFRA-RED

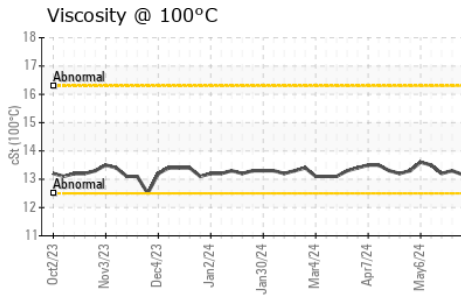
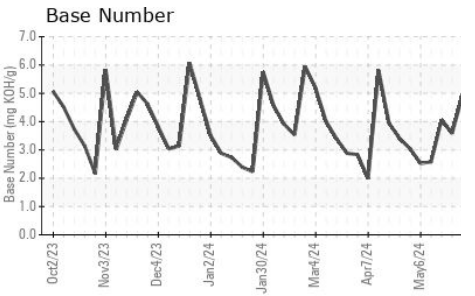
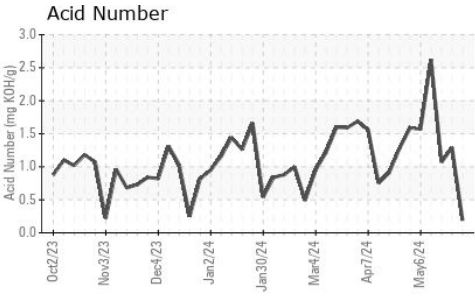
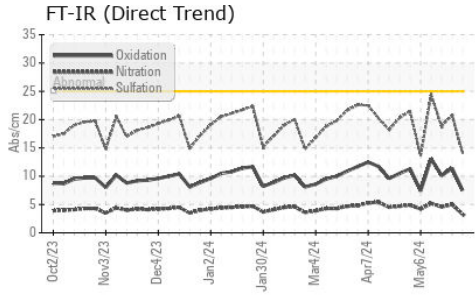
	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844		<b>0</b>	0.1	0.1
Nitration	Abs/cm	*ASTM D7624	>20	<b>3.3</b>	5.0	4.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>14.1</b>	20.8	18.8

## FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>7.5</b>	11.4	10.1
Acid Number (AN)	mg KOH/g	ASTM D8045		<b>0.19</b>	1.29	1.07
Base Number (BN)	mg KOH/g	ASTM D2896		<b>4.94</b>	3.58	4.06



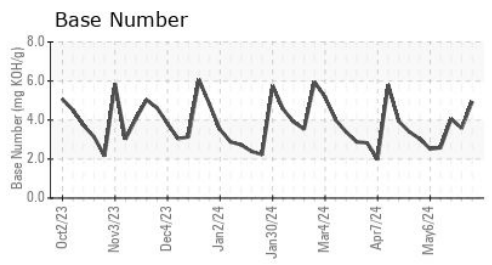
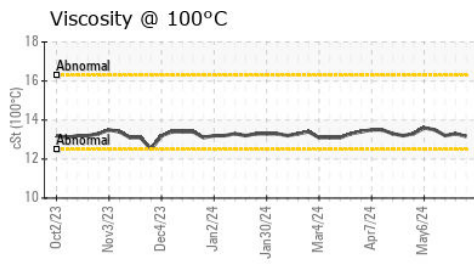
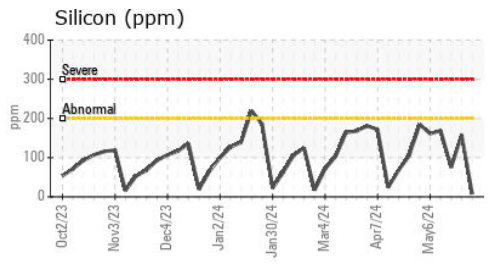
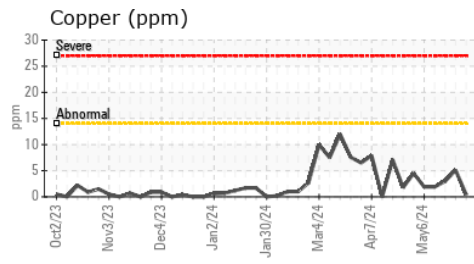
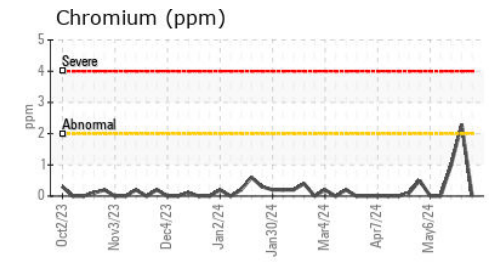
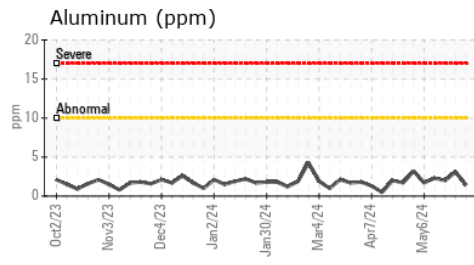
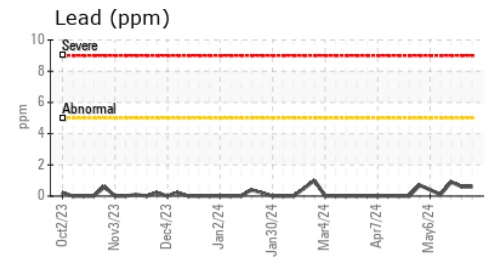
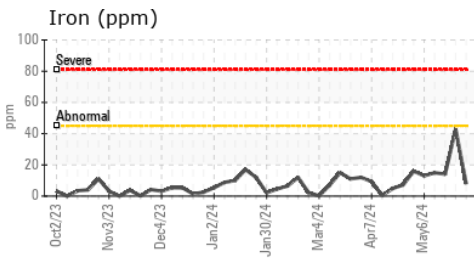
# OIL ANALYSIS REPORT



PARAMETER	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	13.16	13.3	13.2

### GRAPHS



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC0880167  
**Lab Number** : 06207995  
**Unique Number** : 11075456  
**Test Package** : MOB 2 ( Additional Tests: FuelDilution )

**Received** : 12 Jun 2024  
**Tested** : 19 Jun 2024  
**Diagnosed** : 19 Jun 2024 - Jonathan Hester

**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)