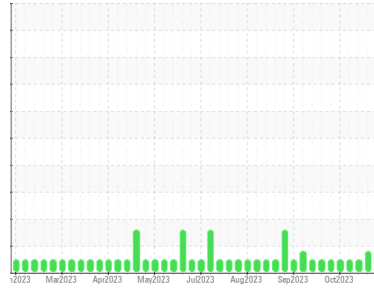




OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Machine Id
CATERPILLAR GM01
 Component
Biogas Engine
 Fluid
MAHLER Q8 Mahler G8 SAE 40 (--- GAL)

DIAGNOSIS

Recommendation
 No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear
 The iron level is abnormal. All other 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		WC0836363	WC0836375	WC0836380
Sample Date	Client Info		16 Oct 2023	13 Oct 2023	10 Oct 2023
Machine Age	hrs	Client Info	23664	23593	23525
Oil Age	hrs	Client Info	191	720	52
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			ABNORMAL	ABNORMAL	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	▲ 78	▲ 49	43
Chromium	ppm	ASTM D5185m >2	1	<1	<1
Nickel	ppm	ASTM D5185m >2	2	<1	<1
Titanium	ppm	ASTM D5185m	0	0	0
Silver	ppm	ASTM D5185m >5	0	0	0
Aluminum	ppm	ASTM D5185m >10	4	3	3
Lead	ppm	ASTM D5185m >5	2	<1	0
Copper	ppm	ASTM D5185m >14	2	3	1
Tin	ppm	ASTM D5185m >13	2	1	1
Vanadium	ppm	ASTM D5185m	0	0	0
Cadmium	ppm	ASTM D5185m	<1	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	5	5	7
Barium	ppm	ASTM D5185m	3	0	0
Molybdenum	ppm	ASTM D5185m	3	2	<1
Manganese	ppm	ASTM D5185m	<1	<1	<1
Magnesium	ppm	ASTM D5185m	28	13	20
Calcium	ppm	ASTM D5185m	1450	1339	1359
Phosphorus	ppm	ASTM D5185m	411	327	381
Zinc	ppm	ASTM D5185m	493	386	452
Sulfur	ppm	ASTM D5185m	2178	1689	1914

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >200	147	104	61
Sodium	ppm	ASTM D5185m	120	81	36
Potassium	ppm	ASTM D5185m >20	8	<1	<1

INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	0	0	0
Nitration	Abs/cm	*ASTM D7624 >20	5.6	5.6	5.2
Sulfation	Abs/.1mm	*ASTM D7415 >30	15.6	15.6	15.2

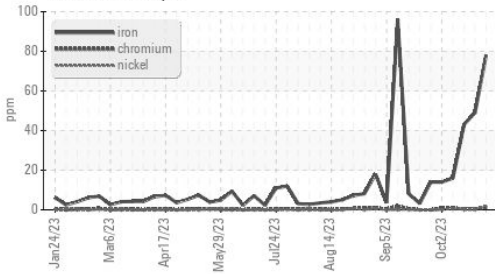
FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	9.6	9.6	9.3
Acid Number (AN)	mg KOH/g	ASTM D8045	0.37	0.29	0.47
Base Number (BN)	mg KOH/g	ASTM D2896 8.0	5.68	6.60	7.47

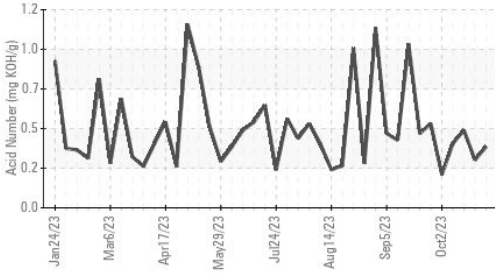


OIL ANALYSIS REPORT

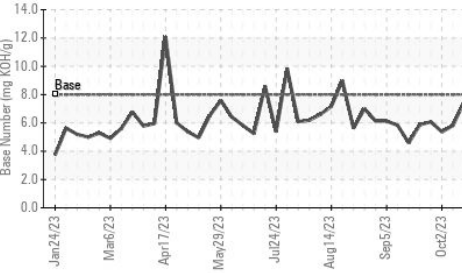
▲ Ferrous Alloys



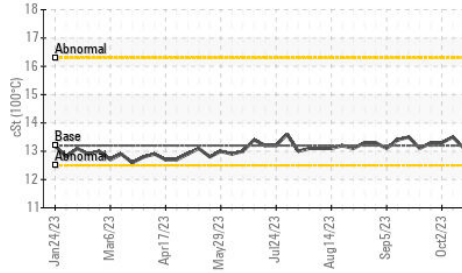
Acid Number



Base Number



Viscosity @ 100°C

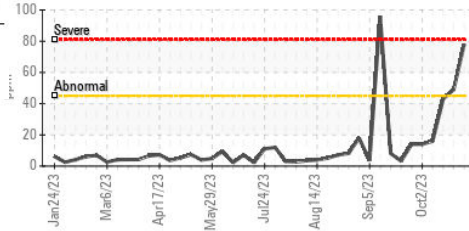


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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

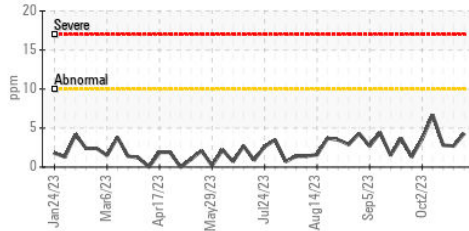
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.2	13.3	13.2

GRAPHS

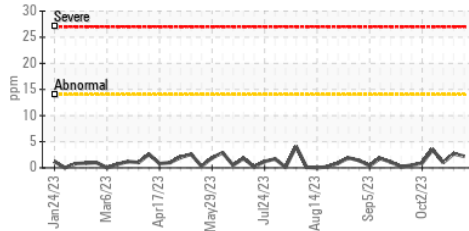
▲ Iron (ppm)



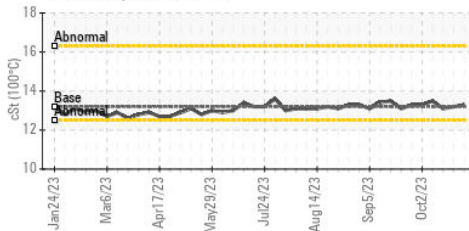
Aluminum (ppm)



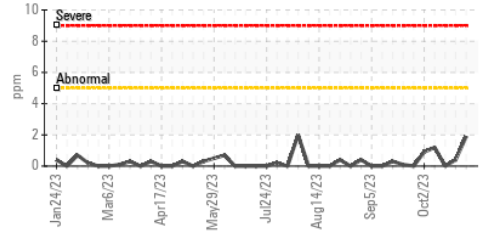
Copper (ppm)



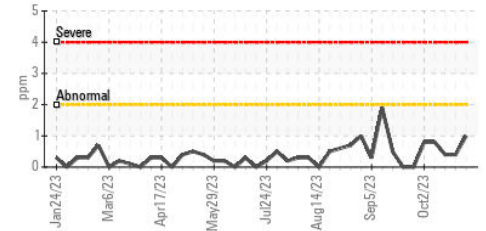
Viscosity @ 100°C



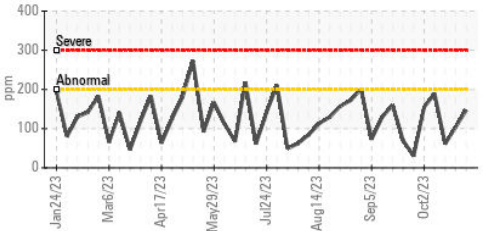
Lead (ppm)



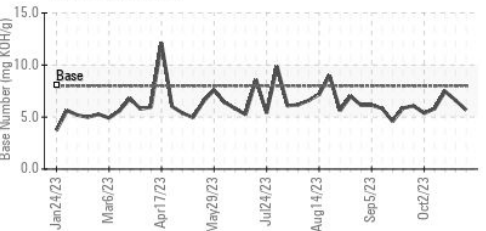
Chromium (ppm)



Silicon (ppm)



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0836363 **Received** : 17 Oct 2023
Lab Number : 05982004 **Diagnosed** : 19 Oct 2023
Unique Number : 10699299 **Diagnostician** : Jonathan Hester
Test Package : MOB 2

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: