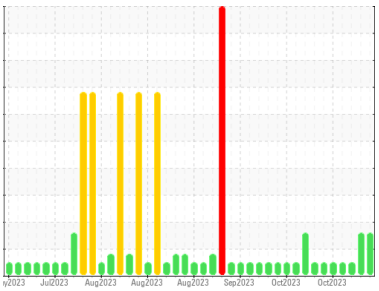
OIL ANALYSIS REPORT

Sample Rating Trend



DIRT

Machine Id
CATERPILLAR GM02
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

All component wear rates are normal.

Contamination

Elemental level of silicon (Si) above normal indicating ingress of seal material.

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.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0870536**	WC0870545	WC0870499
Sample Date		Client Info		**06 Nov 2023**	03 Nov 2023	01 Nov 2023
Machine Age	hrs	Client Info		**65948**	65876	65828
Oil Age	hrs	Client Info		**410**	338	290
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	**16**	9	7
Chromium	ppm	ASTM D5185m	>2	**<1**	<1	0
Nickel	ppm	ASTM D5185m	>2	**1**	<1	0
Titanium	ppm	ASTM D5185m		**0**	0	0
Silver	ppm	ASTM D5185m	>5	**0**	0	0
Aluminum	ppm	ASTM D5185m	>10	**3**	2	2
Lead	ppm	ASTM D5185m	>5	**<1**	<1	0
Copper	ppm	ASTM D5185m	>14	**5**	1	<1
Tin	ppm	ASTM D5185m	>13	**2**	2	2
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	<1	0

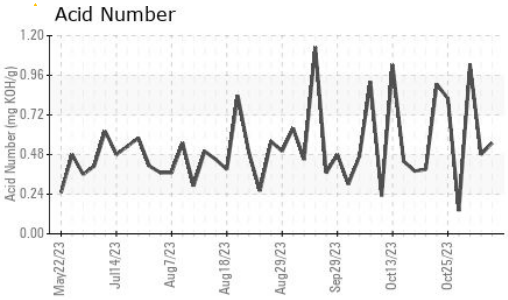
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**0**	<1	0
Barium	ppm	ASTM D5185m		**0**	2	0
Molybdenum	ppm	ASTM D5185m		**1**	1	0
Manganese	ppm	ASTM D5185m		**<1**	0	0
Magnesium	ppm	ASTM D5185m		**9**	7	3
Calcium	ppm	ASTM D5185m		**1426**	1314	1417
Phosphorus	ppm	ASTM D5185m		**367**	368	357
Zinc	ppm	ASTM D5185m		**440**	421	455
Sulfur	ppm	ASTM D5185m		**1966**	2445	1922

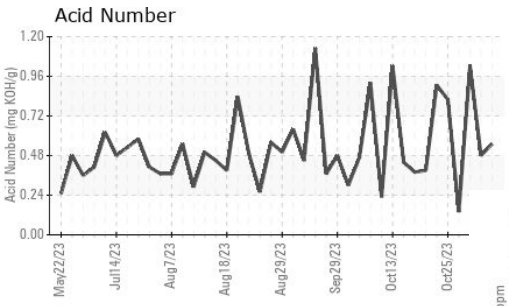
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>200	▲ **220**	▲ 210	193
Sodium	ppm	ASTM D5185m		**3**	0	0
Potassium	ppm	ASTM D5185m	>20	**0**	2	0

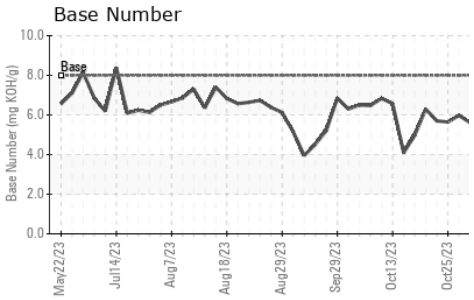
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0**	0	0
Nitration	Abs/cm	*ASTM D7624	>20	**5.6**	5.5	5.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	**16.5**	16.2	16.0

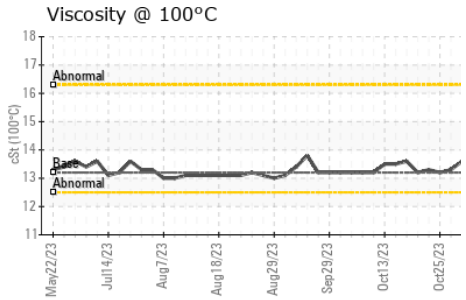
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**10.7**	10.4	10.3
Acid Number (AN)	mg KOH/g	ASTM D8045		**0.55**	0.48	1.025
Base Number (BN)	mg KOH/g	ASTM D2896	8.0	**5.70**	5.82	5.62

OIL ANALYSIS REPORT





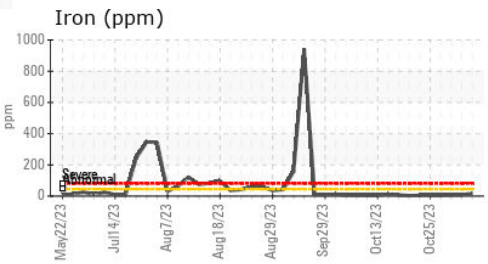


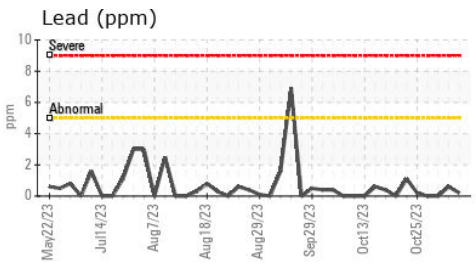


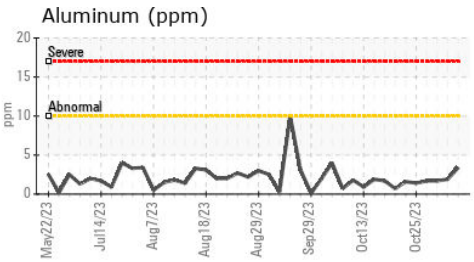
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

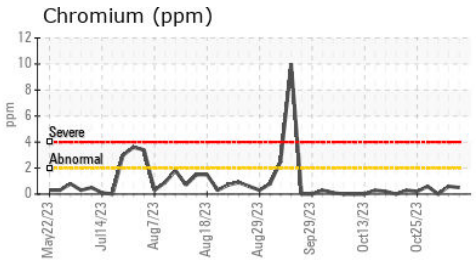
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.2	**13.6**	13.6	13.6

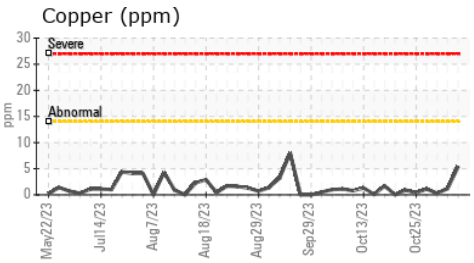
GRAPHS

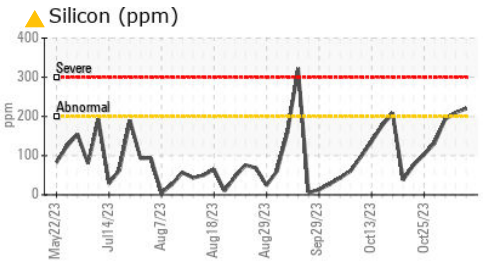


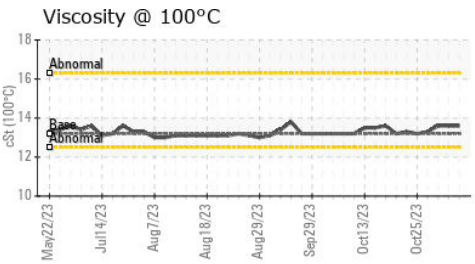


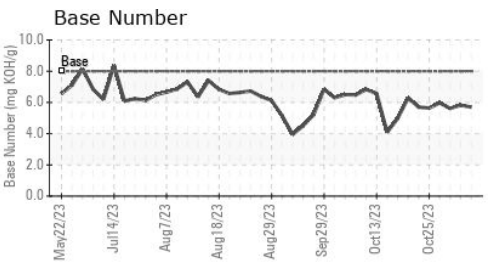












Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0870536
Lab Number : 06001121
Unique Number : 10729481
Test Package : MOB 2

Received : 07 Nov 2023
Diagnosed : 09 Nov 2023
Diagnostician : Sean Felton

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)

OAK GROVE KS
1150 E 700TH AVE
ARCADIA, KS
US 66711
Contact: KALEB WEAVER
kaleb.weaver@cubedistrictenergy.com
T:
F: