

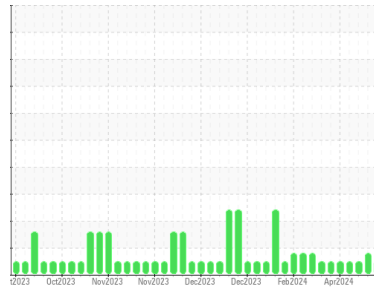


OIL ANALYSIS REPORT



Machine Id
CATERPILLAR GM02
 Component
Biogas Engine
 Fluid
MAHLER Q8 Mahler G8 SAE 40 (--- 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		WC0870547	WC0870554	WC0870555
Sample Date	Client Info		04 Jun 2024	29 Apr 2024	23 Apr 2024
Machine Age	hrs	Client Info	68635	68529	68435
Oil Age	hrs	Client Info	12	50	77
Oil Changed	Client Info		Changed	Changed	N/A
Sample Status			NORMAL	ABNORMAL	NORMAL

CONTAMINATION

	method	limit/base	current	history1	history2
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

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >45	31	▲ 54	26
Chromium	ppm	ASTM D5185m >2	0	<1	<1
Nickel	ppm	ASTM D5185m >2	0	<1	<1
Titanium	ppm	ASTM D5185m	0	<1	<1
Silver	ppm	ASTM D5185m >5	0	0	0
Aluminum	ppm	ASTM D5185m >10	1	2	3
Lead	ppm	ASTM D5185m >5	0	<1	<1
Copper	ppm	ASTM D5185m >14	0	<1	<1
Tin	ppm	ASTM D5185m >13	0	<1	<1
Vanadium	ppm	ASTM D5185m	0	0	<1
Cadmium	ppm	ASTM D5185m	0	<1	<1

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	2	0
Barium	ppm	ASTM D5185m	<1	0	0
Molybdenum	ppm	ASTM D5185m	0	<1	2
Manganese	ppm	ASTM D5185m	<1	<1	<1
Magnesium	ppm	ASTM D5185m	3	4	26
Calcium	ppm	ASTM D5185m	1417	1374	1391
Phosphorus	ppm	ASTM D5185m	366	418	426
Zinc	ppm	ASTM D5185m	437	451	485
Sulfur	ppm	ASTM D5185m	2159	2283	2246

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >200	26	31	47
Sodium	ppm	ASTM D5185m	<1	0	1
Potassium	ppm	ASTM D5185m >20	0	1	<1

INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	0	0.1	0.1
Nitration	Abs/cm	*ASTM D7624 >20	4.5	4.5	5.0
Sulfation	Abs/.1mm	*ASTM D7415 >30	14.8	14.8	15.6

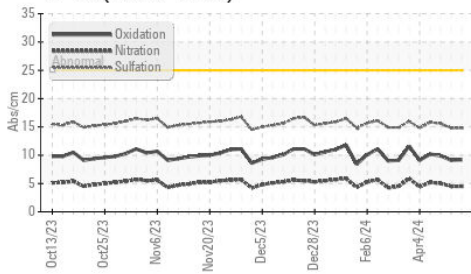
FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	9.2	9.1	9.9
Acid Number (AN)	mg KOH/g	ASTM D8045	0.47	0.914	0.51
Base Number (BN)	mg KOH/g	ASTM D2896 8.0	3.82	5.99	5.47

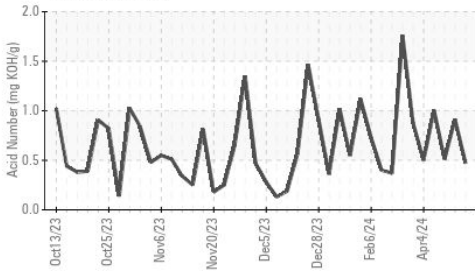


OIL ANALYSIS REPORT

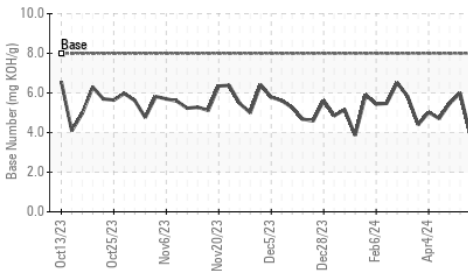
FT-IR (Direct Trend)



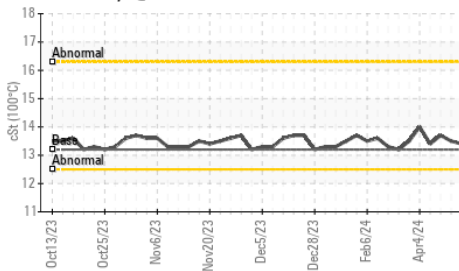
Acid Number



Base Number



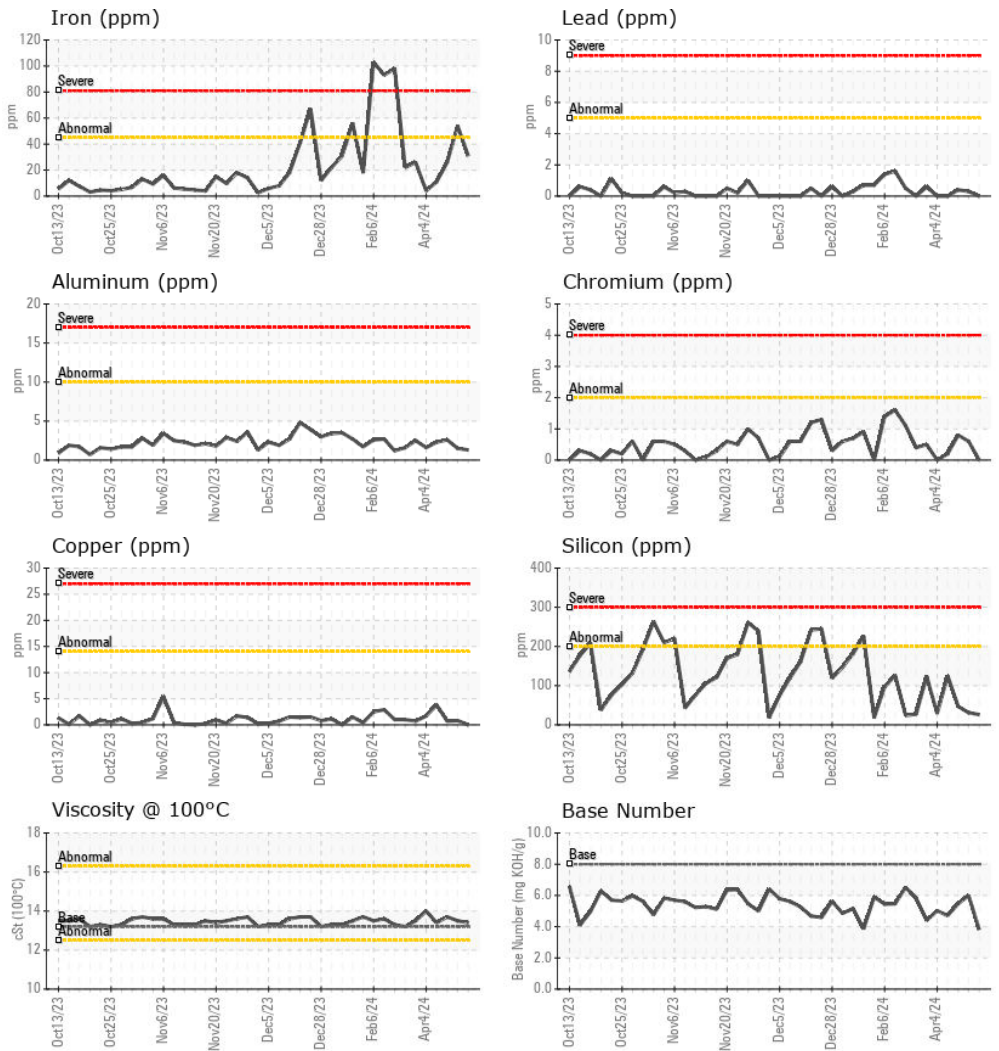
Viscosity @ 100°C



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	13.4	13.5

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : WC0870547

Lab Number : 06200338

Unique Number : 11062461

Test Package : MOB 2

Received : 05 Jun 2024

Tested : 13 Jun 2024

Diagnosed : 13 Jun 2024 - Jonathan Hester

OAK GROVE KS

1150 E 700TH AVE

ARCADIA, KS

US 66711

Contact: KALEB WEAVER

kaleb.weaver@cubedistrictenergy.com

T:

F:

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)