

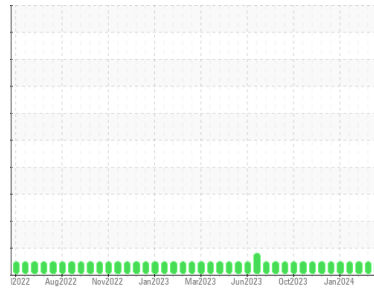


OIL ANALYSIS REPORT



Machine Id
Grand River CAT 1 GRRM01BE
 Component
Biogas Engine
 Fluid
CHEVRON HDAX 9500 GAS ENGINE OIL 40 (90 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			WC0724921	WC0724924	WC0724872
Sample Date	Client Info			17 Apr 2024	08 Apr 2024	27 Mar 2024
Machine Age	hrs	Client Info		72412	72196	71983
Oil Age	hrs	Client Info		1250	1063	810
Oil Changed	Client Info			Not Chngd	Not Chngd	Not Chngd
Sample Status				NORMAL	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel	WC Method	>4.0		<1.0	<1.0	<1.0
Water	WC Method	>.11		NEG	NEG	NEG
Glycol	WC Method			NEG	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>15	2	3	3
Chromium	ppm	ASTM D5185m	>4	0	<1	0
Nickel	ppm	ASTM D5185m		0	<1	<1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>6	1	2	1
Lead	ppm	ASTM D5185m	>9	2	2	<1
Copper	ppm	ASTM D5185m	>6	2	2	2
Tin	ppm	ASTM D5185m	>4	2	2	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		0	<1	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		0	<1	2
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		2	3	3
Manganese	ppm	ASTM D5185m		<1	<1	0
Magnesium	ppm	ASTM D5185m		9	11	14
Calcium	ppm	ASTM D5185m		1928	1976	1941
Phosphorus	ppm	ASTM D5185m		267	313	278
Zinc	ppm	ASTM D5185m		303	370	343
Sulfur	ppm	ASTM D5185m		1869	2124	2131

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>181	46	43	32
Sodium	ppm	ASTM D5185m	>21	2	1	1
Potassium	ppm	ASTM D5185m	>20	0	2	0

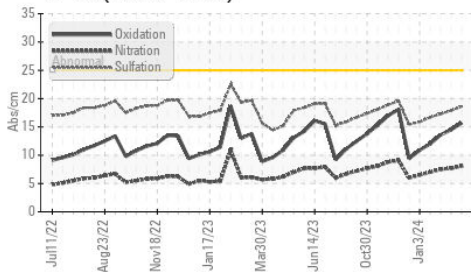
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		0	0	0
Nitration	Abs/cm	*ASTM D7624		8.1	7.7	7.5
Sulfation	Abs/.1mm	*ASTM D7415		18.6	17.9	17.3

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414		15.7	14.5	13.6
Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	1.01	1.60	2.13
Base Number (BN)	mg KOH/g	ASTM D2896	5.4	3.67	3.86	4.62

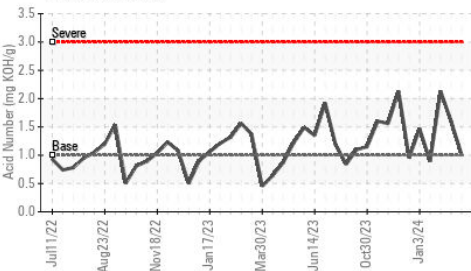


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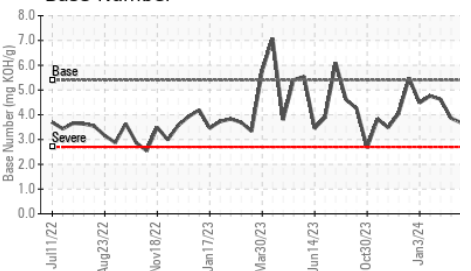
FT-IR (Direct Trend)



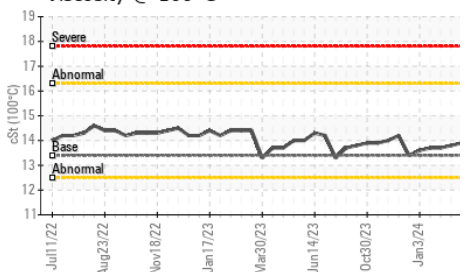
Acid Number



Base Number



Viscosity @ 100°C



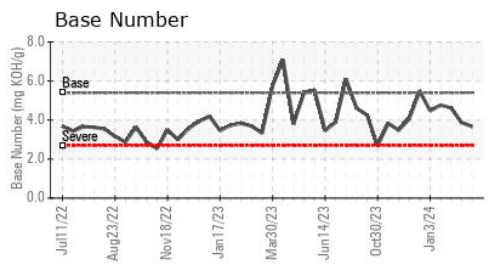
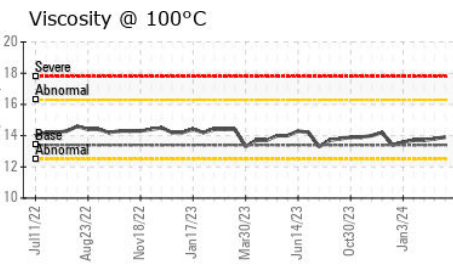
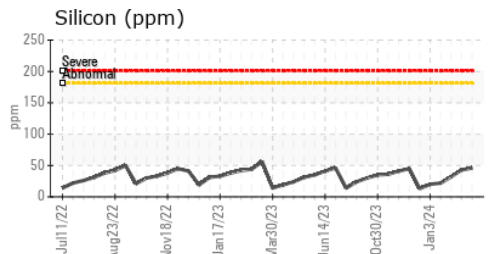
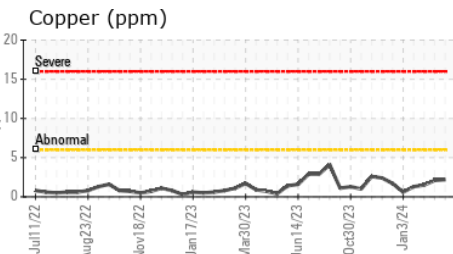
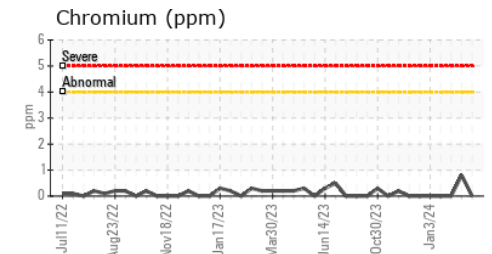
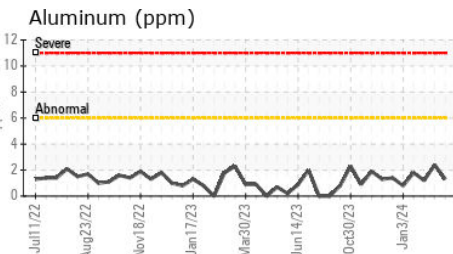
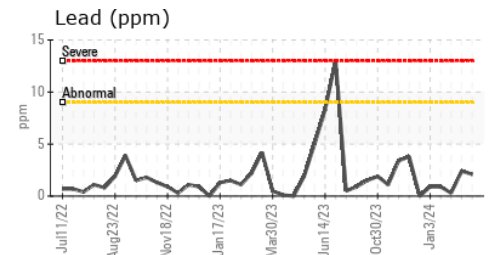
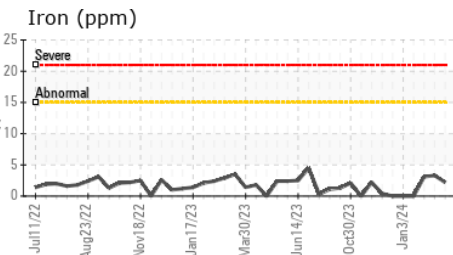
Viscosity @ 100°C



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	LIGHT
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>.11	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.4	13.9	13.8

GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0724921 **Received** : 19 Apr 2024
Lab Number : 06154640 **Tested** : 23 Apr 2024
Unique Number : 10990063 **Diagnosed** : 23 Apr 2024 - Sean Felton
Test Package : MOB 2

EDL NA Recips-Grand River
 Grand River Powerstation, 8550 West Grand River Hwy
 Grand Ledge, MI
 US 48837
 Contact: JAMES ALEXANDER
 james.alexander@edlenergy.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)