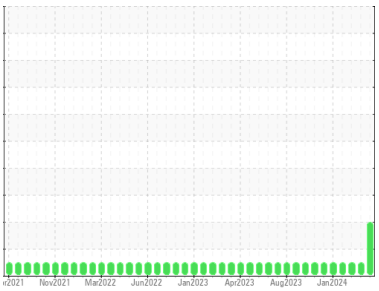
OIL ANALYSIS REPORT

Sample Rating Trend



WEAR

Machine Id
Grand River CAT 5 GRRM05BE
Component
Biogas Engine
Fluid
CHEVRON HDAX 9500 GAS ENGINE OIL 40 (90 GAL)

DIAGNOSIS

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

Wear
The high ferrous density (PQ) index indicates that abnormal wear is occurring.

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		**WC0934190**	WC0724871	WC0724870
Sample Date		Client Info		**17 Jun 2024**	21 Mar 2024	13 Mar 2024
Machine Age	hrs	Client Info		**76692**	76283	76283
Oil Age	hrs	Client Info		**488**	1400	1207
Oil Changed		Client Info		**Not Changd**	Changed	Not Changd
Sample Status				**ABNORMAL**	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
PQ		ASTM D8184	>21	▲ **27**	---	---
Iron	ppm	ASTM D5185m	>15	**1**	4	3
Chromium	ppm	ASTM D5185m	>4	**0**	0	<1
Nickel	ppm	ASTM D5185m		**0**	<1	0
Titanium	ppm	ASTM D5185m		**<1**	0	0
Silver	ppm	ASTM D5185m		**0**	0	0
Aluminum	ppm	ASTM D5185m	>6	**<1**	1	2
Lead	ppm	ASTM D5185m	>9	**0**	2	1
Copper	ppm	ASTM D5185m	>6	**4**	3	2
Tin	ppm	ASTM D5185m	>4	**0**	2	1
Vanadium	ppm	ASTM D5185m		**<1**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

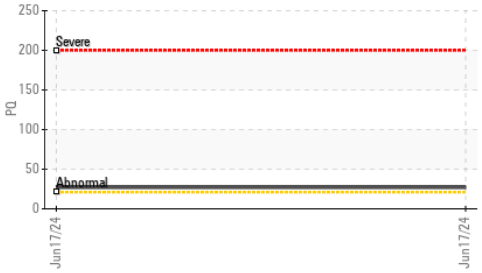
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**12**	1	1
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**3**	2	2
Manganese	ppm	ASTM D5185m		**<1**	<1	0
Magnesium	ppm	ASTM D5185m		**23**	12	11
Calcium	ppm	ASTM D5185m		**1832**	1904	1755
Phosphorus	ppm	ASTM D5185m		**269**	286	265
Zinc	ppm	ASTM D5185m		**337**	350	339
Sulfur	ppm	ASTM D5185m		**1867**	1969	1830

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>181	**25**	55	51
Sodium	ppm	ASTM D5185m	>21	**3**	4	2
Potassium	ppm	ASTM D5185m	>20	**2**	4	4

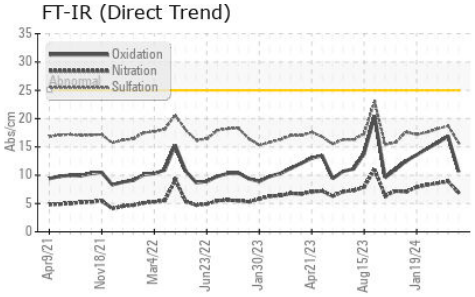
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0**	0	0
Nitration	Abs/cm	*ASTM D7624		**6.9**	8.9	8.6
Sulfation	Abs/.1mm	*ASTM D7415		**15.7**	18.7	18.2

OIL ANALYSIS REPORT

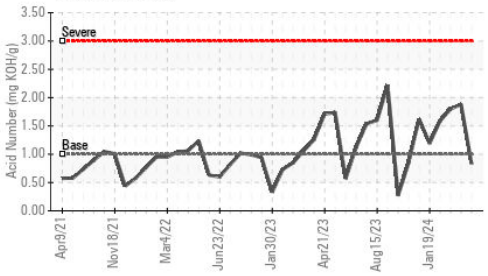
PQ



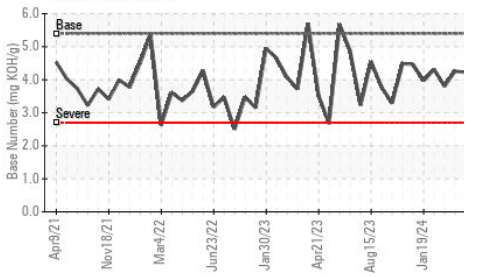
FT-IR (Direct Trend)



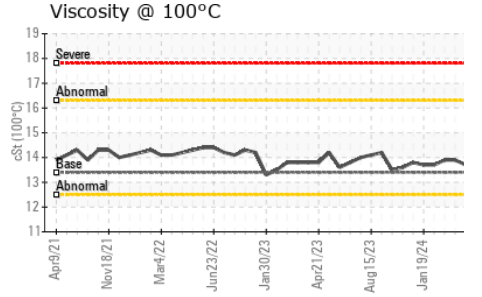
Acid Number



Base Number



Viscosity @ 100°C



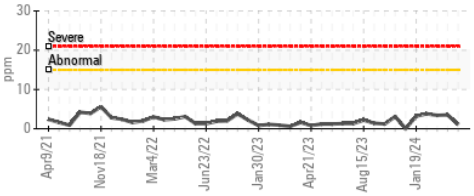
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414		**10.6**	16.9	15.7
Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	**0.83**	1.88	1.80
Base Number (BN)	mg KOH/g	ASTM D2896	5.4	**4.22**	4.26	3.80

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	>.11	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

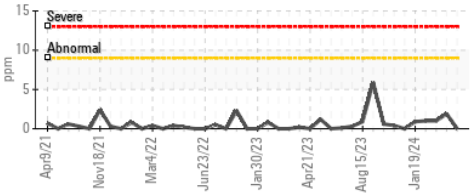
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.4	**13.7**	13.9	13.9

GRAPHS

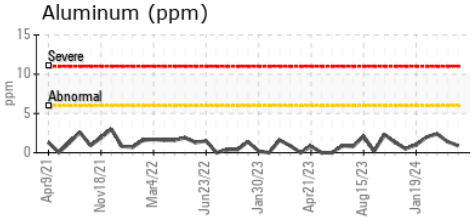
Iron (ppm)



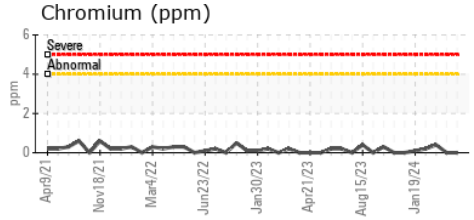
Lead (ppm)



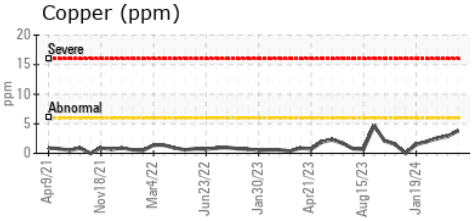
Aluminum (ppm)



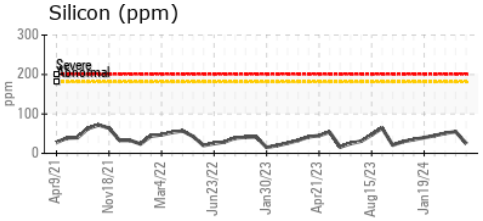
Chromium (ppm)



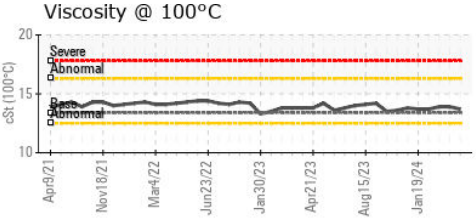
Copper (ppm)



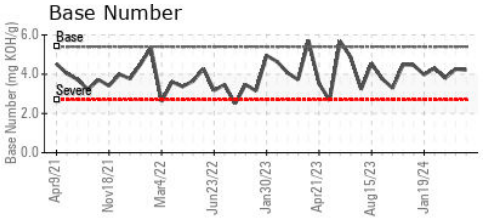
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0934190
Lab Number : 06214918
Unique Number : 11087782
Test Package : MOB 2 (Additional Tests: PQ)

Received : 19 Jun 2024
Tested : 20 Jun 2024
Diagnosed : 21 Jun 2024 - 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)

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Grand Ledge, MI
US 48837
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Report Id: EDLGRAMI [WUSCAR] 06214918 (Generated: 06/21/2024 17:17:55) Rev: 2

Submitted By: Paul Jaworsky