



OIL ANALYSIS REPORT

WEAR	SEVERE
CONTAMINATION	SEVERE
FLUID CONDITION	NORMAL



Machine Id
Coopersville CAT 1 CPVM01BE
Component
Biogas Engine
Fluid
CHEVRON HDAX 9500 GAS ENGINE OIL 40 (105 GAL)

RECOMMENDATION

We recommend that you drain the oil and perform a filter service on this component if not already done. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0871431	WC0871584	WC0871578
Sample Date		Client Info		15 Jul 2024	09 Jul 2024	14 May 2024
Machine Age	hrs	Client Info		19422	19278	17991
Oil Age	hrs	Client Info		832	688	625
Filter Age	hrs	Client Info		832	688	625
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Filter Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				SEVERE	SEVERE	NORMAL

WEAR

The tin level is severe.

PQ		ASTM D8184	>21	16	15	---
Iron	ppm	ASTM D5185m	>15	5	4	<1
Chromium	ppm	ASTM D5185m	>4	<1	<1	0
Nickel	ppm	ASTM D5185m		<1	<1	0
Titanium	ppm	ASTM D5185m		<1	<1	0
Silver	ppm	ASTM D5185m		0	<1	0
Aluminum	ppm	ASTM D5185m	>6	3	3	2
Lead	ppm	ASTM D5185m	>9	2	1	<1
Copper	ppm	ASTM D5185m	>6	2	2	1
Tin	ppm	ASTM D5185m	>4	▲ 9	▲ 8	3
Vanadium	ppm	ASTM D5185m		0	<1	0
White Metal	scalar	*Visual	NONE	LIGHT	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

Elemental level of silicon (Si) above normal.

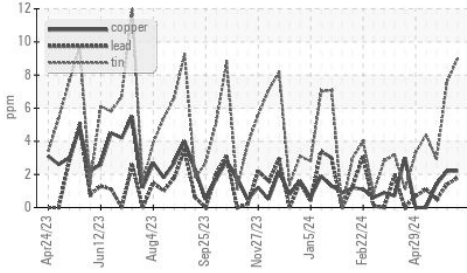
Silicon	ppm	ASTM D5185m	>181	▲ 238	▲ 210	99
Potassium	ppm	ASTM D5185m	>20	2	3	0
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	>.11	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844		0	0	0
Nitration	Abs/cm	*ASTM D7624		5.6	5.4	8.6
Sulfation	Abs/.1mm	*ASTM D7415		20.2	19.5	21.3
Silt	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

FLUID CONDITION

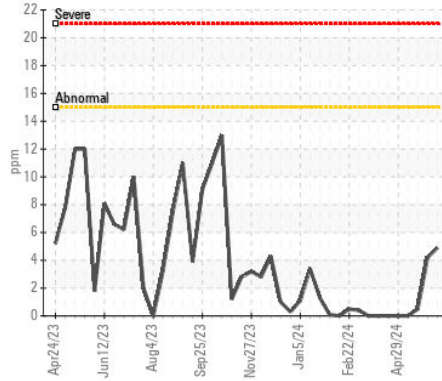
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid.

Sodium	ppm	ASTM D5185m	>21	0	0	<1
Boron	ppm	ASTM D5185m		70	77	75
Barium	ppm	ASTM D5185m		<1	0	0
Molybdenum	ppm	ASTM D5185m		8	7	6
Manganese	ppm	ASTM D5185m		<1	0	<1
Magnesium	ppm	ASTM D5185m		40	39	2
Calcium	ppm	ASTM D5185m		1736	1744	1705
Phosphorus	ppm	ASTM D5185m		414	432	357
Zinc	ppm	ASTM D5185m		631	612	425
Sulfur	ppm	ASTM D5185m		3274	3056	2684
Oxidation	Abs/.1mm	*ASTM D7414		14.9	14.0	16.6
Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	1.08	1.07	1.01
Base Number (BN)	mg KOH/g	ASTM D2896	5.4	4.44	4.26	4.40
Visc @ 100°C	cSt	ASTM D445	13.4	14.7	14.7	13.9

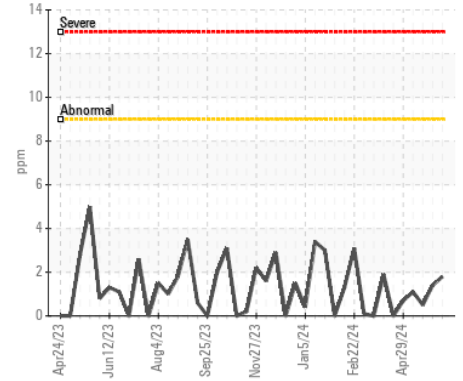
▲ Non-ferrous Metals



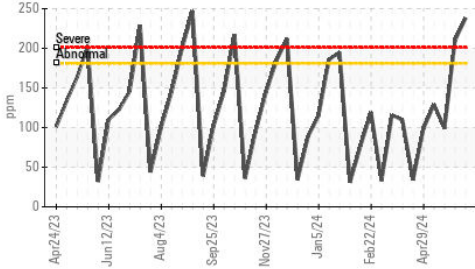
Iron (ppm)



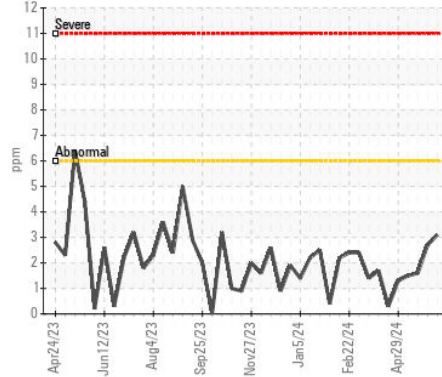
Lead (ppm)



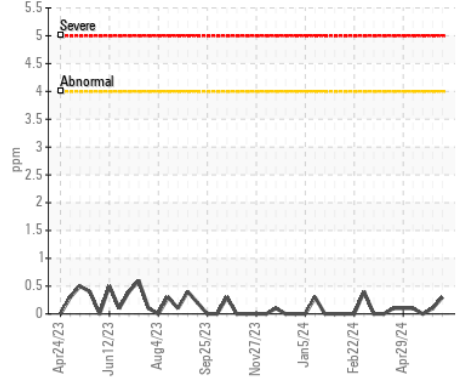
▲ Silicon (ppm)



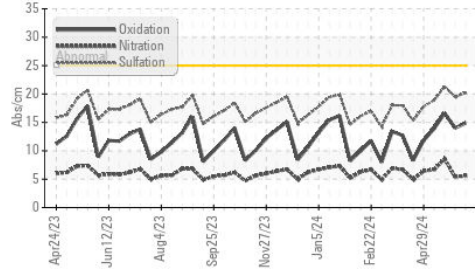
Aluminum (ppm)



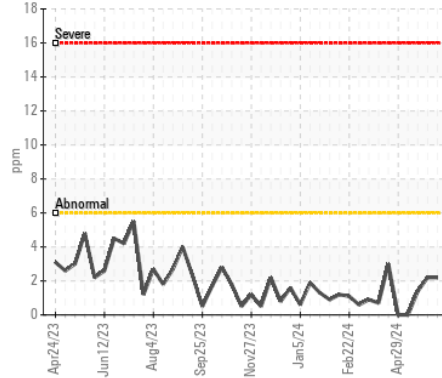
Chromium (ppm)



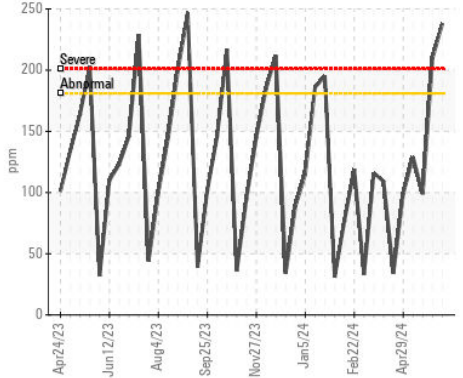
FT-IR (Direct Trend)



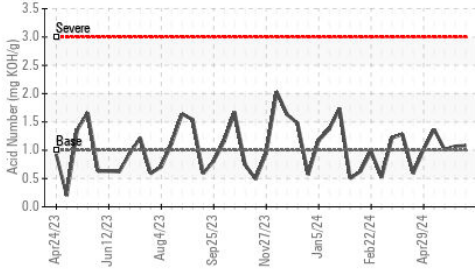
Copper (ppm)



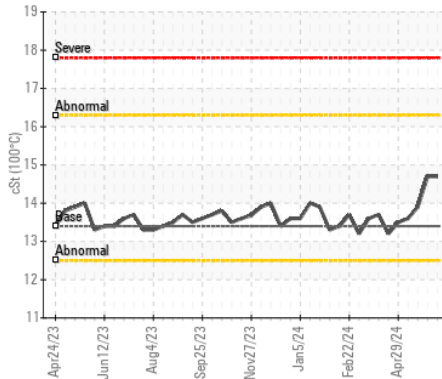
▲ Silicon (ppm)



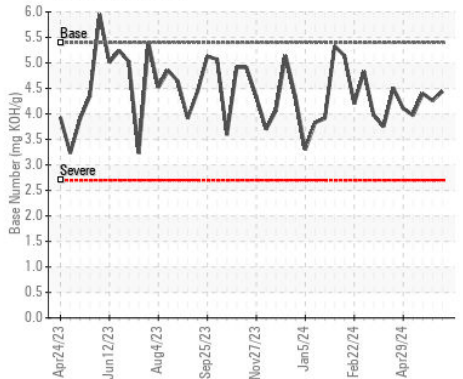
Acid Number



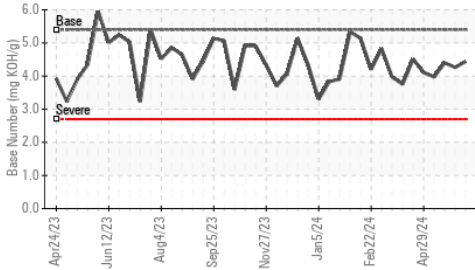
Viscosity @ 100°C



Base Number



Base Number



Certificate L2367

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

Sample No. : WC0871431

Lab Number : 06239306

Unique Number : 11128140

Test Package : MOB 2 (Additional Tests: PQ)

Received : 17 Jul 2024

Tested : 18 Jul 2024

Diagnosed : 19 Jul 2024 - Sean Felton

EDL NA Recips-Coopersville

Coopersville Powerstation, 15362 68th Avenue

Coopersville, MI

US 49404

Contact: Daniel Young

daniel.young@edlenergy.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)