

# **OIL ANALYSIS REPORT**





## Machine Id Grand Blanc CAT 2 GBLM02BE Biogas Engine

Fluid

CHEVRON HDAX 9500 GAS ENGINE OIL 40 (--- GAL)

SAMPLE INFORMATION method



Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: 400hr Oil Sample )

### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

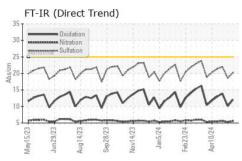
#### Fluid Condition

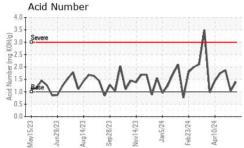
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

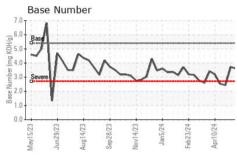
Sample Number		Client Info		WC0905720	WC0905716	WC0905674
Sample Date		Client Info		13 May 2024	06 May 2024	24 Apr 2024
Machine Age	hrs	Client Info		12985	12815	12532
Oil Age	hrs	Client Info		425	257	800
-	1115	Client Info		Not Changd		Not Changd
Oil Changed		Client Into		NORMAL	Changed	Ũ
Sample Status				NORMAL	NORMAL	SEVERE
CONTAMINATION	N	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	<1	0	5
Chromium	ppm	ASTM D5185m	>4	0	<1	<1
Nickel	ppm	ASTM D5185m		0	0	0
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>6	2	2	3
Lead	ppm	ASTM D5185m	>9	2	2	▲ 9
Copper	ppm	ASTM D5185m		2	2	5
Tin	ppm	ASTM D5185m	>4	1	2	2
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
	ррпі			-	-	-
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		21	9	4
Barium	ppm	ASTM D5185m		0	<1	0
Molybdenum	ppm	ASTM D5185m		2	3	3
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m		13	11	12
Calcium	ppm	ASTM D5185m		1734	1727	1842
Phosphorus	ppm	ASTM D5185m		273	267	269
Zinc	ppm	ASTM D5185m		349	331	330
Sulfur	ppm	ASTM D5185m		3447	3073	3412
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>181	114	88	<b>1</b> 92
Sodium	ppm	ASTM D5185m	>21	<1	0	2
Potassium	ppm	ASTM D5185m	>20	0	<1	0
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		0	0	0.1
Nitration	Abs/cm	*ASTM D7624		5.6	5.3	5.6
Sulfation	Abs/.1mm	*ASTM D7415		20.2	18.6	22.0
FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414		12.1	10.1	13.9
Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	1.40	1.04	1.87
Base Number (BN)	mg KOH/g	ASTM D2896	5.4	3.62	3.71	▲ 2.43
( -)	0 - 0					

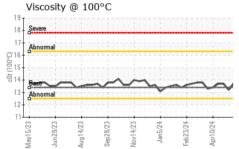


## **OIL ANALYSIS REPORT**









White Metal	scalar	*Visual	NONE	NONE	LIGHT	NO
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NO
recipitate	scalar	*Visual	NONE	NONE	NONE	NO
Silt	scalar	*Visual	NONE	NONE	NONE	NO
Debris	scalar	*Visual	NONE	NONE	NONE	NO
and/Dirt	scalar	*Visual	NONE	NONE	NONE	NO
opearance	scalar	*Visual	NORML	NORML	NORML	NO
Ddor	scalar	*Visual	NORML	NORML	NORML	NO
Emulsified Water	scalar	*Visual	>.11	NEG	NEG	NE
Free Water	scalar	*Visual		NEG	NEG	NE
FLUID PROPE	RTIES	method	limit/base	current	history1	hi
Visc @ 100°C	cSt	ASTM D445	13.4	13.7	13.2	13.
GRAPHS						
Iron (ppm)				Lead (ppm)		
Severe				Severe		
				10 - Abnormal		A
5 Abnormal			шd	-	٨	IV
- M		A 11	~	5-	.1	1
	m	~~v	1		~~~-	-
May15/23 Jun29/23 Aug14/23	Sep 2 8/23 Nov 1 4/23	Jan5/24 Feb23/24	0	May15/23 Jun29/23 Aug14/23	Sep28/23 Nov14/23	Jan5/24 Feb23/24
2 7 7		Ja Feb		May Jur Aug	Sep	다. 관
Aluminum (ppr	m)					
- 0	,			Chromium (	ppm)	
Severe				Chromium (	ppm)	10000000
-				6 5 4 4 Abnormal	ppm)	
Abnormal				6 5 4 4 3	ppm)	
0 - <b>G</b>	1 ~~~			6 5 4 4 Abnormal	ppm)	
	m	$\sim$	~	6 5 4 4 8 bhormal 3 2 1	~~~~	~
Abnormal	m	n5/24 - 5 (23/24 - 5 (10/24 - 5)	~	6 5 4 4 8 bhormal 3 2 1	~~~~	m5/24
May 15/23	Sep28/23	Jan5/24 + 5 Feb:23/24 + 5 Anrin2/4	~	6 5 4 4 3 2 1 0 6 2 5 8 evere 4 4 4 4 6 5 6 2 5 8 8 9 6 7 6 7 8 1 8 9 7 8 1 8 9 7 8 1 8 1 9 1 8 1 9 1 9 1 8 1 9 1 9 1 9 1	Sep28/23	Jan5/24 Feb23/24 Feb23/24
Abnormal EZ/SI/keW Copper (ppm)	m	Jan5/24 - 5 Feb23/24 - 5 Anvi10/24		6 5 4 4 2 1 0 5 5 4 4 4 4 5 5 4 4 4 5 5 5 5 5 5 5 5	Sep28/23	Jan5/24 P
Abnormal EZ/SI/VeW Copper (ppm)	m	Jan5/24 + + + + + + + + + + + + + + + + + + +	25	6 5 4 4 8 6 6 5 6 7 8 8 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	Sep28/23	Jan5/24 Feb/23/24
Copper (ppm)	m	Jan5/24 + + + + + + + + + + + + + + + + + + +	25	6 5 4 4 3 2 1 0 5 5 5 5 8 2 6 5 6 2 6 2 5 6 2 6 2 7 6 2 7 6 2 7 6 2 7 6 2 7 6 2 7 6 7 7 6 7 7 6 7 7 7 7	Sep28/23	Jan5/24
Abnormal EZ/SI/keW Copper (ppm)	m	Jan5/24	25	6 5 4 4 3 2 1 0 5 5 5 5 8 2 6 5 6 2 6 2 5 6 2 6 2 7 6 2 7 6 2 7 6 2 7 6 2 7 6 2 7 6 7 7 6 7 7 6 7 7 7 7	Sep28/23	Han5/24
Abnormal EZ/SJVeW Copper (ppm)	m	Jan5/24 - 5 Feb23/24 - 5 Anvi10/24		6 5 4 4 3 2 1 0 5 5 5 5 8 2 6 5 6 2 6 2 5 6 2 6 2 7 6 2 7 6 2 7 6 2 7 6 2 7 6 2 7 6 7 7 6 7 7 6 7 7 7 7	Sep28/23	Jan5/24 Feb23/24
Abnormal EZSI/keW Copper (ppm)	Nov14/23			Silicon (ppm)	Cap28/23	$\mathcal{N}$
Abnormal EZ/SI/kelW Copper (ppm)	Nov14/23			Silicon (ppm)	Cap28/23	$\mathcal{N}$
hand the second	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50	Jan5/24 + Jan5/24 + Feb23/24 + Fe		6 5 4 4 6 5 6 6 6 6 6 7 6 7 6 7 6 7 6 7 6 7 7 6 7	Sep.28/23	Jan5/24 Jan5/24 Feb23/24 Feb23/24
Copper (ppm) EZ/SI/keW Copper (ppm) Viscosity @ 100	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50			Severe Abnomal EZISI I/New Silicon (ppm Severe Sobromat CZ/SI/New Base Number	Sep.28/23	$\mathcal{N}$
EZISIVEW Copper (ppm) EZISIVEW Viscosity @ 100	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50			Severe Abnormal CZSI/kEW Silicon (ppm Silicon (ppm CZSI/kEW Base Numbe	Sep.28/23	$\mathcal{N}$
Abnomal EZ/S1/keW Copper (ppm) EZ/S1/keW Copper (ppm) Copper (ppm) Copper (ppm) Copper (ppm) Copper (ppm) Copper (ppm) Copper (ppm)	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50			Severe Abnormal CZSI/kEW Silicon (ppm Silicon (ppm CZSI/kEW Base Numbe	Sep.28/23	$\mathcal{N}$
Abnormal Abnormal Copper (ppm) Copper (pp	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50			Severe Abnormal CZSI/kEW Silicon (ppm Silicon (ppm CZSI/kEW Base Numbe	Sep.28/23	$\mathcal{N}$
Abnormal Abnormal Copper (ppm) Copper (pp	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50			Severe Abnormal CZSI/kEW Silicon (ppm Silicon (ppm CZSI/kEW Base Numbe	Sep.28/23	$\mathcal{N}$
Abnormal Abnormal Copper (ppm) Copper (pp	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50		25 20 uid 10 5 5 6 (h)(0) Bui) 40 uin 40 10 10 10 10 10 10 10 10 10 10 10 10 10	Severe Abnormal CE2/S I/NeW Silicon (ppm Silicon (ppm CE2/S I/NeW Base Number Severe Sobromat	Sep.28/23	$\mathcal{N}$
Abnormal EZSI/keW Copper (ppm) EZSI/keW Viscosity @ 100 Severe Abnormal EZSI/keW	Sep28/23 - 55 - 59 - 59 - 59 - 59 - 59 - 50 - 50		25 20 udd 10 25 10 20 10 10 25 20 10 10 25 20 10 10 25 20 10 10 25 20 10 10 25 20 10 10 10 10 10 10 10 10 10 10 10 10 10	Severe Abnormal CZSI/kEW Silicon (ppm Silicon (ppm CZSI/kEW Base Numbe	Sep 28/23 Sep 28/23 Novi 4/23	$\mathcal{N}$

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 **EDL NA Recips-Grand Blanc** Sample No. : WC0905720 Received : 15 May 2024 Grand Blanc Powerstation, 2361 West Grand Blanc Road Lab Number : 06180325 Tested : 16 May 2024 Grand Blanc, MI Unique Number : 11031651 Diagnosed : 17 May 2024 - Sean Felton US 48439 Test Package : MOB 2 Contact: Tony Saint Marie Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. tony.saintmarie@edlenergy.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T:

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: EDLGRA [WUSCAR] 06180325 (Generated: 05/17/2024 15:14:33) Rev: 1

Submitted By: DARREL HILTZ

Page 2 of 2

F:

NORML NEG