

OIL ANALYSIS REPORT





Machine Id SAVM02BE (S/N GZJ00544)

Biogas Engine Fluid

CHEVRON HDAX 9500 GAS ENGINE OIL 40 (141 GAL)



SAMPLE INFORM	/ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0788907	WC0788904	WC0788901
Sample Date		Client Info		02 Apr 2024	14 Mar 2024	20 Feb 2024
Machine Age	hrs	Client Info		77809	77374	76850
Oil Age	hrs	Client Info		211	480	575
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	SEVERE	SEVERE
CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method		NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>14	<1	2	4
Chromium	ppm	ASTM D5185m	>3	0	0	<1
Nickel	ppm	ASTM D5185m		0	<1	<1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m		0	0	<1
Aluminum	ppm	ASTM D5185m	>5	2	2	<1
Lead	ppm	ASTM D5185m	>8	0	2	3
Copper	ppm	ASTM D5185m	>5	3	2	3
Tin	ppm	ASTM D5185m	>3	<1	3	3
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		9	7	3
Barium	ppm	ASTM D5185m		0	0	5
Molybdenum	ppm	ASTM D5185m		10	9	7
Manganese	ppm	ASTM D5185m		0	0	<1
Magnesium	ppm	ASTM D5185m		26	22	10
Calcium	ppm	ASTM D5185m		1821	1958	1502
Phosphorus	ppm	ASTM D5185m		253	286	223
Zine		ACTN DE105m		044	0.40	000

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.

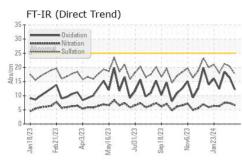
Aluminum	ppm	ASTM D5185m	>5	2	2	<1
Lead	ppm	ASTM D5185m	>8	0	2	3
Copper	ppm	ASTM D5185m	>5	3	2	3
Tin	ppm	ASTM D5185m	>3	<1	3	3
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		9	7	3
Barium	ppm	ASTM D5185m		0	0	5
Molybdenum	ppm	ASTM D5185m		10	9	7
Manganese	ppm	ASTM D5185m		0	0	<1
Magnesium	ppm	ASTM D5185m		26	22	10
Calcium	ppm	ASTM D5185m		1821	1958	1502
Phosphorus	ppm	ASTM D5185m		253	286	223
Zinc	ppm	ASTM D5185m		344	349	292
Sulfur	ppm	ASTM D5185m		1914	2142	1809
CONTAMINANTS		method	limit/base	current	history1	history2
CONTAMINANTS Silicon	ppm	method ASTM D5185m	limit/base	current 123	history1	history2
Silicon	ppm	ASTM D5185m	>180 >20	123	2 45	2 33
Silicon Sodium	ppm ppm	ASTM D5185m ASTM D5185m	>180 >20	123 1	▲ 245 2	▲ 233 0
Silicon Sodium Potassium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	>180 >20 >20	123 1 0	 ▲ 245 2 0 	▲ 233 0 2
Silicon Sodium Potassium INFRA-RED	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m method	>180 >20 >20	123 1 0 current	▲ 245 2 0 history1	▲ 233 0 2 history2
Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844	>180 >20 >20	123 1 0 current 0	▲ 245 2 0 history1 0	▲ 233 0 2 history2 0.1
Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 *ASTM D7624	>180 >20 >20	123 1 0 current 0 6.6	▲ 245 2 0 history1 0 7.4	 233 0 2 history2 0.1 7.5
Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 *ASTM D7624 *ASTM D7415	>180 >20 >20 limit/base	123 1 0 current 0 6.6 17.6	 ▲ 245 2 0 history1 0 7.4 20.3 	 233 0 2 history2 0.1 7.5 21.3
Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7415 method	>180 >20 >20 limit/base	123 1 0 current 0 6.6 17.6 current	 ▲ 245 2 0 history1 0 7.4 20.3 history1 	 233 0 2 history2 0.1 7.5 21.3 history2
Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm ppm ppm % Abs/cm Abs/.1mm TION Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7415 method *ASTM D7414	>180 >20 >20 limit/base	123 1 0 current 0 6.6 17.6 current 12.1	 ▲ 245 2 0 history1 0 7.4 20.3 history1 16.4 	 233 0 2 history2 0.1 7.5 21.3 history2 18.4
Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation Acid Number (AN)	ppm ppm ppm % Abs/cm Abs/.1mm TION Abs/.1mm mg KOH/g	ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415 method *ASTM D7414 ASTM D8045	>180 >20 >20 limit/base limit/base	123 1 0 current 0 6.6 17.6 17.6 12.1 0.87 4.71	 ▲ 245 2 0 history1 0 7.4 20.3 history1 16.4 1.50 3.94 	 233 0 2 history2 0.1 7.5 21.3 history2 18.4 1.62
Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation Acid Number (AN) Base Number (BN)	ppm ppm ppm % Abs/cm Abs/.1mm TION Abs/.1mm mg KOH/g	ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415 method *ASTM D7414 ASTM D8045	>180 >20 >20 limit/base limit/base	123 1 0 current 0 6.6 17.6 17.6 12.1 0.87 4.71	 ▲ 245 2 0 history1 0 7.4 20.3 history1 16.4 1.50 3.94 	 233 0 2 history2 0.1 7.5 21.3 history2 18.4 1.62 3.94

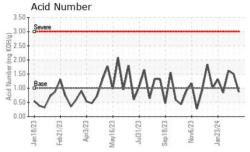
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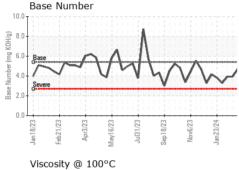


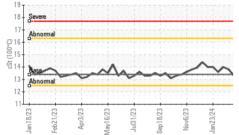
OIL ANALYSIS REPORT

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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		NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPER	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.4	13.3	13.8	14.0
GRAPHS						
Iron (ppm)				Lead (ppm)		
25 20 Severe	1.1.1.1.1.1.1		15	Severe		
			10	Foodundin		
5 - Abnormal		1	ШШ	Abnormal	Å	
5-	۸.		5		λ	Λ.
1 v	m~	N	\overline{N}		MAN	$\square M$
Jan 18/23 Feb 21/23 Apr3/23	Jul31/23	Sep18/23 Nov6/23		Jan 1 8/23 Feb 2 1/23 Apr3/23	May16/23 Jul31/23 Sep18/23	Nov6/23 Jan23/24
Jan1 Feb2 Ap	Jul	Sep 1 Nov	2000	Jan1 Feb2 Ap	May1 Jul3	Nov Jan2
Aluminum (ppm)				Chromium (pj	om)	
12 IO			5	Severe		
8-			4	AL		
6 - Abnormal			۳	- 0		
4			Z			
	-	\sim			~~~~	\sim
	/23	3/23 5/23			5/23 5/23	3/23
Jan 18/23 Feb 21/23 Apr3/23	Jul31/23	Sep 18/23 Nov6/23		Jan 18/23 Feb 21/23 Apr3/23	May16/23 Jul31/23 Sep18/23	Nov6/23 Jan23/24
Copper (ppm)				Silicon (ppm)	_	
²⁰ T		1200000000000	500		111111111111111111111111111111111111111	
15 - Severe			400		11.	
10-			E 300	Same A	/VM AA	M.
Abnormal			200	1/1/1/		
5 denominal	N	$\sim \wedge$	100	VVV	····· Y	VV
	23+	23	0 5	23	23	23
Jan 18/23	Jul31/23	Sep18/23 Nov6/23	201	Jan 1 8/23 - Feb 2 1/23 - Apr3/23 -	May16/23 Jul31/23 Sep18/23	Nov6/23 - Jan23/24 -
ع ≥ Viscosity @ 100°		v2	5		Se J M.	- P
VISCOSITY @ 100°	u 	130000000000	10.0	Base Number		
8 Severe			(0)(H0) 6.0 Base Wmper (mg K0H/0) 8 Base Vmmper (mg K0H/0) 8 Base Vmmpe	the transmission	11000	
6- Abnormal			¥ 6.0		A /	
14 - Base	000		A.0	2	VWW	2m
Abnormal			N 2.0	oevere		
104			0.0	L		
Jan 18/23 Feb 21/23 Apr3/23	/23	(/23	5	23	23	/23
	53	118	2	(18/ 313/	31,	23
Jan Feb Aş	Jul31/23	Sep 18/23 . Nov6/23 .		Jan18/23 Feb21/23 Apr3/23	May16/23 Jul31/23 Sep18/23	Nov6/23 Jan23/24

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 **EDL NA Recips-Sand Valley** Sample No. : WC0788907 SAND VALLEY POWER STATION, 3345 COUNTY ROAD 209 Received : 04 Apr 2024 Lab Number : 06138734 Tested : 05 Apr 2024 COLLINSVILLE, AL Unique Number : 10963542 Diagnosed : 06 Apr 2024 - Don Baldridge US 35961 Test Package : MOB 2 Contact: BRANDON PEYTON Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. brandon.peyton@energydi.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)

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Submitted By: FRANK WILLIAMS

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