

OIL ANALYSIS REPORT

Sample Rating Trend



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

All component wear rates are normal.

Elemental level of silicon (Si) above normal indicating ingress of seal material.

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

DIAGNOSIS

Contamination

Fluid Condition

suitable for further service.

Wear

Machine Id **PECM04BE** Component

Biogas Engine

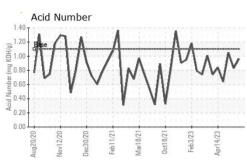
CHEVRON HDAX 9500 GAS ENGINE OIL 40 (150 GAL)

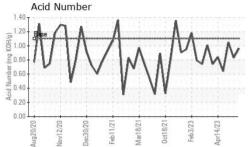
2/020 Nov/020 Dec/020 Feb/021 Ne2/021 Det/021 Feb/023 Apr/023

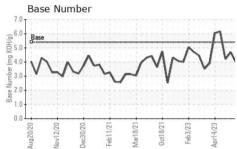
2020 Nov2020 Doc2020 Fe62021 Mar2021 Occ2021 Fe62023 Apr2023									
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2			
Sample Number		Client Info		WC0788393	WC0788279	WC0788274			
Sample Date		Client Info		21 Feb 2024	07 Feb 2024	23 Jan 2024			
Machine Age	hrs	Client Info		66510	66172	65825			
Oil Age	hrs	Client Info		519	180	750			
Oil Changed		Client Info		Not Changd	Changed	Not Changd			
Sample Status				ABNORMAL	NORMAL	ABNORMA			
CONTAMINATION	I	method	limit/base	current	history1	history2			
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0			
Water		WC Method	>0.1	NEG	NEG	NEG			
Glycol		WC Method		NEG	NEG	NEG			
WEAR METALS		method	limit/base	current	history1	history2			
Iron	ppm	ASTM D5185m	>15	3	0	9			
Chromium	ppm	ASTM D5185m	>4	<1	0	<1			
Nickel	ppm	ASTM D5185m		<1	0	<1			
Titanium	ppm	ASTM D5185m		<1	0	<1			
Silver	ppm	ASTM D5185m	>5	<1	0	0			
Aluminum	ppm	ASTM D5185m		<1	2	3			
Lead	ppm	ASTM D5185m	>9	1	1	3			
Copper	ppm	ASTM D5185m		3	<1	<u> </u>			
Tin	ppm	ASTM D5185m	>4	3	1	3			
Vanadium	ppm	ASTM D5185m		<1	0	<1			
Cadmium	ppm	ASTM D5185m		<1	0	<1			
ADDITIVES	PP	method	limit/base	current	history1	history2			
					83	4			
Boron	ppm	ASTM D5185m		16		4			
Barium	ppm	ASTM D5185m		5	0	0			
March de alle services				-	0	0			
Molybdenum	ppm	ASTM D5185m		5	2	2			
Manganese	ppm	ASTM D5185m		<1	<1	<1			
Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m		<1 28	<1 23	<1 30			
Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		<1 28 2268	<1 23 1381	<1 30 1694			
Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 28 2268 340	<1 23 1381 308	<1 30 1694 255			
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 28 2268 340 442	<1 23 1381 308 489	<1 30 1694 255 342			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 28 2268 340 442 4192	<1 23 1381 308 489 2979	<1 30 1694 255 342 3137			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	limit/base	<1 28 2268 340 442 4192 current	<1 23 1381 308 489 2979 history1	<1 30 1694 255 342 3137 history2			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m		<1 28 2268 340 442 4192 current 194	<1 23 1381 308 489 2979 history1 133	<1 30 1694 255 342 3137 history2 152			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	>181	<1 28 2268 340 442 4192 current 194 0	<1 23 1381 308 489 2979 history1 133 1	<1 30 1694 255 342 3137 history2 152 2			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	>181	<1 28 2268 340 442 4192 current 194	<1 23 1381 308 489 2979 history1 133	<1 30 1694 255 342 3137 history2 152			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	>181	<1 28 2268 340 442 4192 current ▲ 194 0 2 current	<1 23 1381 308 489 2979 history1 133 1	<1 30 1694 255 342 3137 history2 152 2 7			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm i ppm i ppm i ppm i ppm i ppm i ppm i ppm i ppm i	ASTM D5185m ASTM D5185m	>181 >20 limit/base	<1 28 2268 340 442 4192 current 194 0 2 current 0	<1 23 1381 308 489 2979 history1 133 1 0 history1 0	<1 30 1694 255 342 3137 history2 152 2 7 history2 0			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>181 >20 limit/base	<1 28 2268 340 442 4192 current ▲ 194 0 2 current	<1 23 1381 308 489 2979 history1 133 1 0 history1	<1 30 1694 255 342 3137 history2 152 2 7 history2			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm i ppm i ppm i ppm i ppm i ppm i ppm i ppm i ppm i	ASTM D5185m ASTM D5185m	>181 >20 limit/base >20	<1 28 2268 340 442 4192 current 194 0 2 current 0	<1 23 1381 308 489 2979 history1 133 1 0 history1 0	<1 30 1694 255 342 3137 history2 152 2 7 history2 0			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844	>181 >20 limit/base >20	<1 28 2268 340 442 4192 current 0 2 current 0 5.1	<1 23 1381 308 489 2979 history1 133 1 0 history1 0 4.9	<1 30 1694 255 342 3137 history2 152 2 7 history2 0 5.1 18.5			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624	>181 >20 limit/base >20 >30 limit/base	<1 28 2268 340 442 4192 current 194 0 2 current 0 5.1 18.3	<1 23 1381 308 489 2979 history1 133 1 0 history1 0 4.9 16.3	<1 30 1694 255 342 3137 history2 152 2 7 history2 0 5.1			
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7415	>181 >20 limit/base >20 >30 limit/base	<1 28 2268 340 442 4192 Current 0 2 Current 0 5.1 18.3 Current	<1 23 1381 308 489 2979 history1 133 1 0 history1 0 4.9 16.3 history1	<1 30 1694 255 342 3137 history2 152 2 7 history2 0 5.1 18.5 history2			

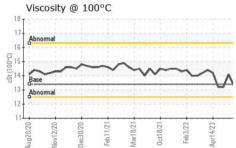


OIL ANALYSIS REPORT









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	VISUAL		method	limit/base	current	history1	history2
	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
NN	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
W.	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
Apr14/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Api	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
A A	FLUID PROPERT	IES	method	limit/base	current	history1	history2
W.	Visc @ 100°C	cSt	ASTM D445	13.4	13.3	14.1	13.2
	GRAPHS						
	Iron (ppm)			15	Lead (ppm)		
53	to a more so a		the second	15	Severe		
Feb3/23 Apr14/23	60+		A	_ 10	Abnormal		
	튭 40 -			bhu	>		
	20 - Severe		-11-	5			٨
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Th	Aug20/20 Nov12/20 Dec30/20 Feb11/21	Mar18/2	Oct18/21 Feb3/23 Apr14/23		Aug20/20 Nov12/20 Dec30/20	Feb11/21 Mar18/21 Oct18/21	Feb3/23 Apr14/23
V		N	A P		4 1		AI I
	Aluminum (ppm)	1000,51537	100000000000	6	Chromium (p	,	
	10-		1	5	Abnormal		
	8 - Abnormal		1	4 843			
Apr14/23	4			음 ³ 2			
Ap	2	N	M	\wedge	~~		A A
		3/21	3/21	0	720	1/21	Z3 Z3
	Aug20/20 Nov12/20 Dec30/20 Feb11/21	Mar18/2	Oct18/21 Feb3/23 Apr14/23		Aug 20/20 Nov12/20 Dec30/20	Feb11/21 Mar18/21 0ct18/21	Feb 3/23 Apr1 4/23
	Copper (ppm)	10700			Silicon (ppm)	1075	
	20 T	100000000	00000000	250	Silivere	annananan	NORMANNA -
2	15 - Severe			200	0	A	
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				A 100		MI. AI	$\Lambda \Lambda M$
	Abnomal 5-	۸.		A	IVV	MAN	MN
r14/23 -	5 Abnormal		m		IVVV	rW	W
Apr14/23	5 Abnormal	18/21	b3/23	<u>10</u> 50	V	12/11/	P3/23
Apri 4/23	Aug2020 0 0 Nov1220 0 0 0 Dec3020 0 Feb11/21	12525	Oct18/21+5 Feb3/23+55	<u>10</u> 50	Aug20/20 Nov12/20 Dec30/20	Feb11/21 Mar18/21 0ct18/21	Feb3/23 April 4/23
Apr14/23	Abnormal 5 0 0 0 0 0 0 0 0 0 0 0 0 0	12525	Oct18/21 Feb3/23 Apr14/23	<u>JV</u> 50 0	Base Number		Feb3/23 - April 4/23 - April 4/
Apri 4/23	Abnormal 0 00000 00000000000000000000000000000	12525	0ct18/21	<u>JV</u> 50 0	Base Number		Feb3/23
Apr14/23	Abnormal 5 0 0 0 0 0 0 0 0 0 0 0 0 0	12525	0ct18/211	<u>JV</u> 50 0	Base Number		Feb323
Apr14/23	Abnormal 0 0 0 0 0 0 0 0 0 0 0 0 0	12525	Oct18/21+5	<u>JV</u> 50 0	Base Number		F643/23 Apri 4/23
April 4/23	Abnormal 5 0 0 0 0 0 0 0 0 0 0 0 0 0	12525	0ct18/21	<u>JV</u> 50 0	Base Number		Feb3/23 April4/23
Apr14/23 +	Abnormal 0 02020 me 0 02020 me 0 02020 me 0 02020 me 0 02020 me 0 0200	~~		500 0 (0)H(0)X (0)H(0	OZ/02/07/07/07/07/07/07/07/07/07/07/07/07/07/	~~^	mh
Apr14/23	Abnormal 0 02020 me 0 02020 me 0 02020 me 0 02020 me 0 02020 me 0 0200	~~		500 0 (0)H(0)X (0)H(0	OZ/02/07/07/07/07/07/07/07/07/07/07/07/07/07/	~~^	r A
Apr14/23	Abnormal 5 0 0 0 0 0 0 0 0 0 0 0 0 0	~~	0ct18/21 - 0ct18/21 - 6 Feb3/23 - 6 Aori 4/23 - Aori 4/23 - 6	500 0 (0)H(0)X (0)H(0	Base Number		Feb3/23 - Feb3/23 - Feb3/23 - April 4/23 - A
iboratory	Abnormal 5 0 0 0 0 0 0 0 0 0 0 0 0 0	Mar18/21	+12/81200 +12/81200 n Ave., Cary	NC 27513	Pase Number	1211121 12111121 1211121 1211121 1211121 1211121 1211121 1211121 1211121 1211121 12111121 12111121 12111111	4 + CZIFUIJUBY + CZIFUIJUBY
boratory mple No.	Abnormal Viscosity @ 100°C Abnormal Viscosity @ 100°C Abnormal (2,000)	1 Madiso Recei	E216 June 1278 June n Ave., Cary ved : 23	NC 27513 Feb 2024	Pase Number	1201109 1201109 EDL NA Recij V POWER STATION, 2993	CERTERINGTON
oratory pple No. Number	Abnormal Viscosity @ 100°C Viscosity @ 100°C Abnormal Control of the second	1 Madiso Recei Teste	E216 June 1278 June n Ave., Cary ved : 23 d : 26	NC 27513 Feb 2024 Feb 2024	Pecan ROV	1201109 1201109 EDL NA Recij V POWER STATION, 2993	S-Pecan Ron WHETHERINGTON I ALDOSTA, G
aboratory ample No. ab Number ique Number	Abnormal	1 Madiso Recei	E216 June 1278 June n Ave., Cary ved : 23 d : 26	NC 27513 Feb 2024	Pecan ROV	12/11 42/12/12/12/12/12/12/12/12/12/12/12/12/12	CERTERINGTON
aboratory ample No. ab Number ique Number est Package mple report,	Abnormal	1 Madiso Recei Teste Diagn	n Ave., Cary ved : 23 d : 26 iosed : 27 00-237-1369	NC 27513 Feb 2024 Feb 2024 - Se	Pecan ROV	1271194 1271194 EDL NA Recip V POWER STATION, 2993 V	CZFPECAN RO SWHETHERINGTON ALDOSTA, G US 3160 JASON JONE