

OIL ANALYSIS REPORT



Hancock CAT 3 (S/N 3RC00176)

Component **Biogas Engine**

CHEVRON HDAX LFG SAE 40 (--- GAL)





Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

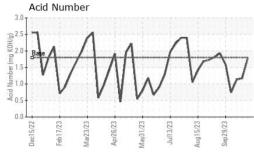
Fluid Condition

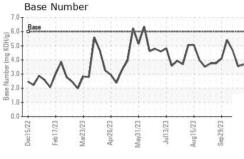
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

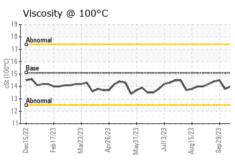
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0851275	WC0851223	WC0851210
Sample Date		Client Info		27 Oct 2023	20 Oct 2023	12 Oct 2023
Machine Age	hrs	Client Info		71026	70861	70682
Oil Age	hrs	Client Info		655	490	311
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATIO	V	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	ourront	history1	history2
				current	•	•
Iron	ppm	ASTM D5185m	>15	10	7	6
Chromium	ppm	ASTM D5185m		<1	0	0
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>6	2	1	<1
Lead	ppm	ASTM D5185m	>9	<1	<1	0
Copper	ppm	ASTM D5185m	>14	2	<1	1
Tin	ppm	ASTM D5185m	>4	6	6	4
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVEC		اء مالم مدر	limit/base	current	الاستعادات	history2
ADDITIVES		method	IIIIII/Dase	Current	history1	HISTOLYZ
Boron	ppm	ASTM D5185m	IIIIII/Dase	0	0	0
	ppm		IIIIII/Dase			
Boron		ASTM D5185m	IIIIIII/Dase	0	0	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	IIIIII/Dase	0 0	0	0
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	IIIIII/Dase	0 0 <1	0 0 <1	0 0 <1
Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	IIIIII/Dase	0 0 <1 <1	0 0 <1 <1	0 0 <1 <1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	270	0 0 <1 <1 5	0 0 <1 <1 2	0 0 <1 <1 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	270	0 0 <1 <1 5 1794	0 0 <1 <1 2 1738	0 0 <1 <1 0 1665
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	270	0 0 <1 <1 5 1794 294	0 0 <1 <1 2 1738 269	0 0 <1 <1 0 1665 220
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	270	0 0 <1 <1 5 1794 294 328	0 0 <1 <1 2 1738 269 342	0 0 <1 <1 0 1665 220 272
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	270 310	0 0 <1 <1 5 1794 294 328 2168	0 0 <1 <1 2 1738 269 342 2215	0 0 <1 <1 0 1665 220 272 1880
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	270 310	0 0 <1 <1 5 1794 294 328 2168	0 0 <1 <1 2 1738 269 342 2215 history1	0 0 <1 <1 0 1665 220 272 1880 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	270 310 limit/base >181	0 0 <1 <1 5 1794 294 328 2168 current	0 0 <1 <1 2 1738 269 342 2215 history1	0 0 <1 <1 0 1665 220 272 1880 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	270 310 limit/base >181	0 0 <1 <1 5 1794 294 328 2168 current 163	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1	0 0 <1 <1 0 1665 220 272 1880 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	270 310 limit/base >181 >20	0 0 <1 <1 5 1794 294 328 2168 current 163 2 1	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1 <1 history1	0 0 <1 <1 0 1665 220 272 1880 history2 120 <1 0 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	270 310 limit/base >181 >20 limit/base	0 0 <1 <1 5 1794 294 328 2168 current 163 2 1 current 0.1	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1 <1 history1 0	0 0 <1 <1 0 1665 220 272 1880 history2 120 <1 0 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	270 310 limit/base >181 >20 limit/base	0 0 <1 <1 5 1794 294 328 2168 current 163 2 1 current 0.1 7.0	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1 <1 history1	0 0 <1 <1 0 1665 220 272 1880 history2 120 <1 0 history2
Boron Barium Molybdenum 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 Method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method *ASTM D7844 *ASTM D7624 *ASTM D76145	270 310 limit/base >181 >20 limit/base >20 >30	0 0 <1 <1 <1 5 1794 294 328 2168 current 163 2 1 current 0.1 7.0 21.1	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1 <1 0 6.5 20.1	0 0 <1 <1 0 1665 220 272 1880 history2 120 <1 0 history2 0 5.9 18.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm	ASTM D5185m Method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method *ASTM D7844 *ASTM D7624 *ASTM D7415 Method	270 310 limit/base >181 >20 limit/base >20 >30 limit/base	0 0 <1 <1 <1 5 1794 294 328 2168 current 163 2 1 current 0.1 7.0 21.1 current	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1 <1 history1 0 6.5 20.1 history1	0 0 -(1) -(1) 0 1665 220 272 1880 history2 120 -(1) 0 history2 0 5.9 18.6 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm	ASTM D5185m METHOD ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m METHOD *ASTM D7844 *ASTM D7624 *ASTM D7415 METHOD *ASTM D7414	270 310 limit/base >181 >20 limit/base >20 >30 limit/base >25	0 0 -1 -1 -1 -5 -1794 -294 -328 -2168	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1 <1 history1 0 6.5 20.1 history1 14.6	0 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm	ASTM D5185m Method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method *ASTM D7844 *ASTM D7624 *ASTM D7415 Method	270 310 limit/base >181 >20 limit/base >20 >30 limit/base	0 0 <1 <1 <1 5 1794 294 328 2168 current 163 2 1 current 0.1 7.0 21.1 current	0 0 <1 <1 2 1738 269 342 2215 history1 145 <1 <1 history1 0 6.5 20.1 history1	0 0



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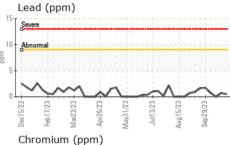


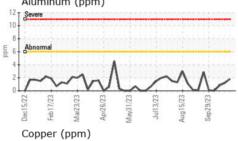


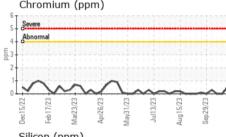
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

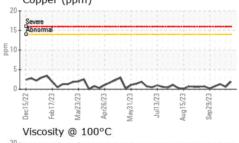
FLUID FROFER	THES	memou			HISTOLAL	HISTORY
Visc @ 100°C	cSt	ASTM D445	15.1	14.1	14.1	14.0

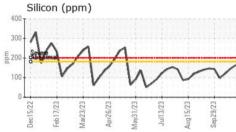
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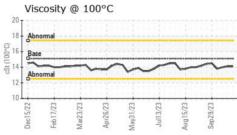


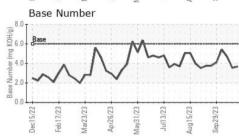
















Certificate L2367

Laboratory Sample No. Lab Number

Unique Number Test Package : MOB 2

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0851275 : 05994509 : 10722869

Received

: 31 Oct 2023 : 01 Nov 2023 Diagnosed : Sean Felton Diagnostician

EDL NA Recips-Hancock County HANCOCK COUNTY POWER STATION, 3574 TOWNSHIP ROAD 142

FINDLAY, OH US 45840

Contact: TIM CUSICK tim.cusick@energydevelopments.com

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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