

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id HBKM02BE

Component Biogas Engine Fluid

SHELL MYSELLA S5 S (48 GAL)

Diriciteoio

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Top Up Amount: 30 GAL)

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 INFORM	1ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0775167	WC0775169	WC0775170
Sample Date		Client Info		29 May 2024	22 May 2024	16 May 2024
Machine Age	hrs	Client Info		107015	106853	106717
Oil Age	hrs	Client Info		179	17	644
Oil Changed		Client Info		Oil Added	Changed	Oil Added
Sample Status				NORMAL	NORMAL	SEVERE
CONTAMINATION	١	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	4	1	6
Chromium	ppm	ASTM D5185m	>3	<1	0	<1
Nickel	ppm	ASTM D5185m		<1	0	<1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m		<1	<1	<1
Aluminum	ppm	ASTM D5185m		2	2	4
Lead	ppm	ASTM D5185m	>8	<1	<1	<1
Copper	ppm	ASTM D5185m	>5	1	0	2
Tin	ppm	ASTM D5185m	>3	2	<1	4 5
Vanadium	ppm	ASTM D5185m		<1	0	<1
Cadmium	ppm	ASTM D5185m		<1	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	ASTM D5185m	limit/base	35	history1 24	history2 4
Boron Barium	ppm ppm		limit/base	35 2	24 0	4
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	35 2 12	24 0 11	4 0 6
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	35 2 12 <1	24 0 11 0	4 0 6 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	35 2 12 <1 108	24 0 11 0 115	4 0 6 <1 21
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		35 2 12 <1 108 1644	24 0 11 0 115 1629	4 0 6 <1 21 1673
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	35 2 12 <1 108 1644 585	24 0 11 0 115 1629 532	4 0 6 <1 21 1673 396
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		35 2 12 <1 108 1644 585 665	24 0 11 0 115 1629 532 637	4 0 6 <1 21 1673 396 465
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	300	35 2 12 <1 108 1644 585	24 0 11 0 115 1629 532	4 0 6 <1 21 1673 396
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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	300 limit/base	35 2 12 <1 108 1644 585 665 3976 current	24 0 11 0 115 1629 532 637 3581 history1	4 0 6 <1 21 1673 396 465 3606 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	300 limit/base >180	35 2 12 <1 108 1644 585 665 3976 current 95	24 0 11 0 115 1629 532 637 3581 history1 27	4 0 6 <1 21 1673 396 465 3606 history2 ▲ 204
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	300 300 limit/base >180 >20	35 2 12 <1 108 1644 585 665 3976 <u>current</u> 95 <1	24 0 11 0 115 1629 532 637 3581 history1 27 <1	4 0 6 <1 21 1673 396 465 3606 history2 ▲ 204 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	300 limit/base >180	35 2 12 <1 108 1644 585 665 3976 current 95	24 0 11 0 115 1629 532 637 3581 history1 27	4 0 6 <1 21 1673 396 465 3606 history2 ▲ 204
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	300 300 limit/base >180 >20	35 2 12 <1 108 1644 585 665 3976 current 95 <1 2	24 0 111 0 115 1629 532 637 3581 history1 27 <1 <1 <1 history1	4 0 6 <1 21 1673 396 465 3606 history2 204 0 3 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm 1 ppm 2 ppm 2 ppm 2 ppm 2 ppm 2 ppm 3 ppm 4 ppm 4 ppm 2 ppm 2 ppm 4 ppm 4 ppm 3 ppm 4 ppm 4	ASTM D5185m ASTM D5185m	300 limit/base >180 >20 >20	35 2 12 <1 108 1644 585 665 3976 <i>current</i> 95 <1 2 <i>current</i> 0.1	24 0 11 0 115 1629 532 637 3581 history1 27 <1 <1 <1 <1 history1 0	4 0 6 <1 21 1673 396 465 3606 history2 204 0 3 3 bistory2 0
Boron Barium Molybdenum 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	300 limit/base >180 >20 >20	35 2 12 <1 108 1644 585 665 3976 <i>current</i> 95 <1 2 <i>current</i> 0.1 5.2	24 0 11 0 115 1629 532 637 3581 history1 27 <1 <1 <1 history1 0 3.9	4 0 6 <1 21 1673 396 465 3606 history2 ▲ 204 0 3 3 bistory2 0 5.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm 1 ppm 2 ppm 2 ppm 2 ppm 2 ppm 2 ppm 3 ppm 4 ppm 4 ppm 2 ppm 2 ppm 4 ppm 4 ppm 3 ppm 4 ppm 4	ASTM D5185m ASTM D5185m	300 limit/base >180 >20 >20	35 2 12 <1 108 1644 585 665 3976 <i>current</i> 95 <1 2 <i>current</i> 0.1	24 0 11 0 115 1629 532 637 3581 history1 27 <1 <1 <1 <1 history1 0	4 0 6 <1 21 1673 396 465 3606 history2 204 0 3 3 bistory2 0
Boron Barium Molybdenum 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	300 limit/base >180 >20 >20	35 2 12 <1 108 1644 585 665 3976 <i>current</i> 95 <1 2 <i>current</i> 0.1 5.2	24 0 11 0 115 1629 532 637 3581 history1 27 <1 <1 <1 history1 0 3.9	4 0 6 <1 21 1673 396 465 3606 history2 ▲ 204 0 3 3 bistory2 0 0 5.5
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 ASTM D5185m	300 imit/base >180 >20 >20 >20 imit/base	35 2 12 <1 108 1644 585 665 3976 <u>current</u> 95 <1 2 <u>current</u> 0.1 5.2 25.9	24 0 11 0 115 1629 532 637 3581 history1 27 <1 <1 <1 history1 0 3.9 17.3	4 0 6 21 1673 396 465 3606 history2 204 0 3 204 0 3 3 history2 0 5.5 5.5 22.7
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 ASTM D7844 *ASTM D7624	300 imit/base >180 >20 >20 >20 imit/base	35 2 12 <12 108 1644 585 665 3976 <i>current</i> 95 <1 2 <i>current</i> 0.1 5.2 25.9 <i>current</i>	24 0 11 0 115 1629 532 637 3581 history1 27 <1 <1 <1 history1 0 3.9 17.3 history1	4 0 6 <1 21 1673 396 465 3606 history2 204 0 3 3 history2 0 5.5 22.7
Boron Barium Molybdenum 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 D7844 *ASTM D7624 *ASTM D7414	300 imit/base >180 >20 >20 >20 limit/base limit/base	35 2 12 <1 108 1644 585 665 3976 current 95 <1 2 current 0.1 5.2 25.9 current 20.8 1.06 4.93	24 0 111 0 115 1629 532 637 3581 history1 27 <1 <1 <1 history1 0 3.9 17.3 history1 11.7 0.93 5.77	4 0 6 31 21 1673 396 465 3606 history2 204 0 3 204 0 3 history2 0 5.5 22.7 history2

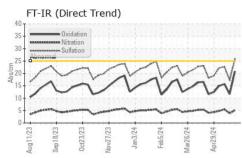
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Submitted By: Samantha Gauger

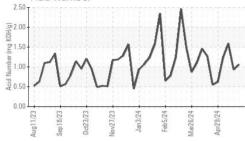
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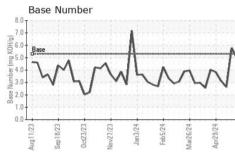


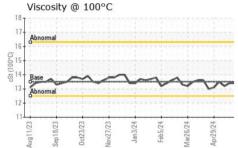
OIL ANALYSIS REPORT











		method	limit/base	current	history1	histo
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	NOR
Odor	scalar	*Visual	NORML	NORML	NORML	NOR
Emulsified Water	scalar	*Visual		NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT Visc @ 100°C	IES cSt	method ASTM D445	limit/base 13.5	current	history1 13.4	histo 13.2
GRAPHS	CSI	ASTNI D445	13.5	13.4	13.4	13.2
Iron (ppm)				Lead (ppm)		
Savara		ana ana ana	15	⁵ T 3 3 3 3 5 5 5 5 5 5 5 5 7 3 3		
Abnormal		(1700) (007)	10	Severe Abnormal		noutini
E2/L1/23/23/23/23/23/23/23/23/23/23/23/23/23/	Jan3/24	Feb5/24 Mar26/24 Anr29/24		Chromina Sep 18/23 0ct23/23	Uov27/23 Jan3/24 Feb5/24	Mar26/24
) + O				Severe		
	\sim	m		Abnormal		
	Jan3/24	Feb5/24		Abnormal	Nov27/23 - Jan3/24 + Feb5/24 - 5	Mar26/24
Abnormal Copper (ppm)	Jan3/24 - <	Feb5/24	250 200 <u>E</u> 150 50	Abnormal Abnormal (2) (2) (2) (2) (2) (2) (2) (2)	Nov21/23 - Jan3/24 - Feb5/24 -	Maz6/24
Abnormal Abnormal Copper (ppm) Severe	Jan3/24 + Jan3/24 - San3/24 - San3/2	Feb5/24 Feb5/24 Feb5/24 Fob/26/24 Feb5/24 Fob/26/24 Feb5/24 Fob/26/24 Fob/26/26 Fob/26/24 Fob/26/24 Fob/26/24 Fob/26/24 Fob/26/24 Fob/26/24 Fob/26/26 Fob/26		Abnormal Control Control Cont	Nov21/23 Jan3/24 Feb5/24 Feb5/24	\mathcal{M}
Abnormal Copper (ppm) Severe Copper (ppm) Copper (ppm)	~	~~~~\		Abnormal Control Control Cont	\mathcal{M}	\mathcal{M}



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

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