

# **OIL ANALYSIS REPORT**

## Sample Rating Trend







# Machine Id MTNM01BE Component Biogas Engine Fluid SHELL MYSELLA S5 N 40 (160 GAL)

## DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: As stated on paper note section we were hoping to do soot testing or additional testing to see why it's so dark in such a short amount of time.)

#### Wear

All component wear rates are normal.

## Contamination

There is no indication of any contamination in the oil

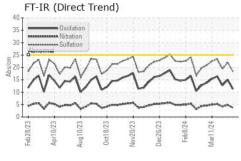
## **Fluid Condition**

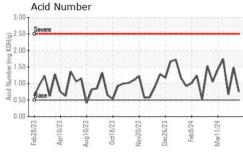
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

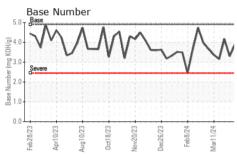
Sample Number   Client Info   WC0775219   WC0775217   WC0775215   Sample Date   Client Info   10 Apr 2024   26 Mar 2024   27 Mar 2024   28 M	40 (160 GAL)		12023 Apr20	23 Aug2023 Oct2023	NovZUZ3 Dec2UZ3 FebZUZ4	Mar2U24	
Client Info	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   42071   41990   41861	Sample Number		Client Info		WC0775219	WC0775217	WC0775214
Oil Changed	Sample Date		Client Info		10 Apr 2024	01 Apr 2024	26 Mar 2024
Cili Changed   Cilient Info   N/A   N/A   N/A   N/A   NORMAL   N	Machine Age	hrs	Client Info		42071	41990	41861
NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   nistory1   nistory2   nistory3   ni	Oil Age	hrs	Client Info		75	143	14
CONTAMINATION   method   limit/base   current   history1   history2	Oil Changed		Client Info		N/A	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >14         1         4         3           Chromium         ppm         ASTM D5185m         0         0         0           Nickel         ppm         ASTM D5185m         0         0         0           Silver         ppm         ASTM D5185m         0         0         0           Silver         ppm         ASTM D5185m         0         0         0           Aluminum         ppm         ASTM D5185m         >5         2         3         3           Lead         ppm         ASTM D5185m         >5         -1         <1	CONTAMINATION	٧	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >14         1         4         3           Chromium         ppm         ASTM D5185m         >3         0         0         0           Nickel         ppm         ASTM D5185m         0         0         0         0           Silver         ppm         ASTM D5185m         0         0         0         0           Aluminum         ppm         ASTM D5185m         >5         2         3         3         3           Lead         ppm         ASTM D5185m         >5         2         3         3         3           Lead         ppm         ASTM D5185m         >5         -1         <1	Water		WC Method		NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS		method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>14	1	4	3
Titanium	Chromium	ppm	ASTM D5185m	>3	0	0	0
Silver	Nickel	ppm	ASTM D5185m		0	<1	<1
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0
Lead	Silver	ppm	ASTM D5185m		0	0	0
Copper         ppm         ASTM D5185m         >5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Aluminum	ppm	ASTM D5185m	>5	2	3	3
Copper         ppm         ASTM D5185m         >5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <0         0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0         <0	Lead	ppm	ASTM D5185m	>8	0	0	0
Tin	Copper		ASTM D5185m	>5	<1	<1	<1
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         4           Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         2         5         4           Manganese         ppm         ASTM D5185m         0         0         0           Manganesium         ppm         ASTM D5185m         0         0         0           Magnesium         ppm         ASTM D5185m         1427         1706         1488           Phosphorus         ppm         ASTM D5185m         300         279         361         301           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         >180         47         167         99           CONTAMINANTS         method         limit/base         current         his				>3			
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         4           Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         2         5         4           Mangaese         ppm         ASTM D5185m         0         0         0           Magnesium         ppm         ASTM D5185m         11         37         25           Calcium         ppm         ASTM D5185m         1427         1706         1488           Phosphorus         ppm         ASTM D5185m         317         435         390           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history2           Solicon         ppm         ASTM D5185m         >20         2         1	Vanadium					0	0
Boron					0		
Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         2         5         4           Manganese         ppm         ASTM D5185m         0         0         0           Magnesium         ppm         ASTM D5185m         11         37         25           Calcium         ppm         ASTM D5185m         1427         1706         1488           Phosphorus         ppm         ASTM D5185m         300         279         361         301           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D7844         0.1         0.1         0.1           Nitration         Abs/.1mm         *ASTM D7624	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         2         5         4           Manganese         ppm         ASTM D5185m         0         0         0           Magnesium         ppm         ASTM D5185m         11         37         25           Calcium         ppm         ASTM D5185m         1427         1706         1488           Phosphorus         ppm         ASTM D5185m         300         279         361         301           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >180         47         167         99           Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %	Boron	ppm	ASTM D5185m		0	4	4
Manganese         ppm         ASTM D5185m         0         0         0           Magnesium         ppm         ASTM D5185m         11         37         25           Calcium         ppm         ASTM D5185m         1427         1706         1488           Phosphorus         ppm         ASTM D5185m         300         279         361         301           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history1           Soot %	Barium	ppm	ASTM D5185m		0	0	0
Magnesium         ppm         ASTM D5185m         11         37         25           Calcium         ppm         ASTM D5185m         1427         1706         1488           Phosphorus         ppm         ASTM D5185m         300         279         361         301           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >180         47         167         99           Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1           Nitration<	Molybdenum	ppm	ASTM D5185m		2	5	4
Calcium         ppm         ASTM D5185m         1427         1706         1488           Phosphorus         ppm         ASTM D5185m         300         279         361         301           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >180         47         167         99           Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4	Manganese	ppm	ASTM D5185m		0	0	0
Phosphorus         ppm         ASTM D5185m         300         279         361         301           Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >180         47         167         99           Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1           Nitration         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history1 <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td>11</td> <td>37</td> <td>25</td>	Magnesium	ppm	ASTM D5185m		11	37	25
Zinc   ppm   ASTM D5185m   317   435   390     Sulfur   ppm   ASTM D5185m   2960   3934   3399     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >180   47   167   99     Sodium   ppm   ASTM D5185m   >20   2   1   1     Potassium   ppm   ASTM D5185m   >20   0   0   0     INFRA-RED   method   limit/base   current   history1   history2     Soot %   *ASTM D7844   0.1   0.1   0.1   0.1     Nitration   Abs/cm   *ASTM D7624   >16   3.7   4.9   4.2     Sulfation   Abs/.1mm   *ASTM D7415   18.3   22.0   19.4     FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/.1mm   *ASTM D7414   11.3   15.0   12.8     Acid Number (AN)   mg KOH/g   ASTM D8045   0.5   0.75   1.48   0.67	Calcium	ppm	ASTM D5185m		1427	1706	1488
Zinc         ppm         ASTM D5185m         317         435         390           Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >180         47         167         99           Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8	Phosphorus	ppm	ASTM D5185m	300	279	361	301
Sulfur         ppm         ASTM D5185m         2960         3934         3399           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >180         47         167         99           Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48			ASTM D5185m		317	435	390
Silicon         ppm         ASTM D5185m         >180         47         167         99           Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	Sulfur		ASTM D5185m		2960	3934	
Sodium         ppm         ASTM D5185m         >20         2         1         1           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	Silicon	ppm	ASTM D5185m	>180	47	167	99
INFRA-RED	Sodium	ppm	ASTM D5185m	>20	2	1	1
Soot %         %         *ASTM D7844         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	Potassium	ppm	ASTM D5185m	>20	0	0	0
Nitration         Abs/cm         *ASTM D7624         >16         3.7         4.9         4.2           Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	Soot %	%	*ASTM D7844		0.1	0.1	0.1
Sulfation         Abs/.1mm         *ASTM D7415         18.3         22.0         19.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	Nitration	Abs/cm	*ASTM D7624	>16	3.7	4.9	4.2
Oxidation         Abs/.1mm         *ASTM D7414         11.3         15.0         12.8           Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67							
Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Acid Number (AN)         mg KOH/g         ASTM D8045         0.5         0.75         1.48         0.67	Oxidation	Abs/.1mm	*ASTM D7414		11.3	15.0	12.8
				0.5			

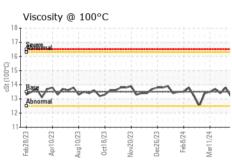


# **OIL ANALYSIS REPORT**





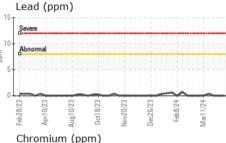


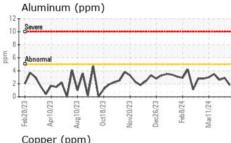


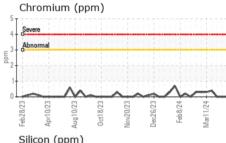
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

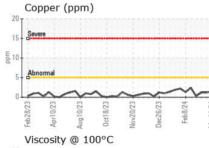
FLUID PROPER	TIES	method				history2
Visc @ 100°C	cSt	ASTM D445	13.5	13.2	13.8	13.4

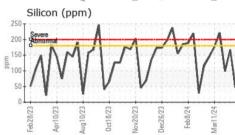
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Abn	ormal						
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Feb28/23	Apr10/23	Aug 10/23	Oct18/23	Nov20/23	Jec26/23	Feb8/24	Mar11/24

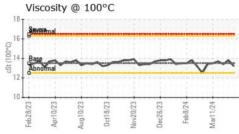


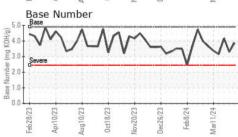
















Laboratory Sample No.

: WC0775219 Lab Number : 06148889 Unique Number : 10978967

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested** Diagnosed

: 15 Apr 2024 : 16 Apr 2024 : 24 Apr 2024 - Jonathan Hester

**EDL NA Recips-Morgantown** Morgantown Powerstation, 950 Shiloh Morgantown, PA

US 19543 Contact: ARON GUNN aron.gunn@edlenergy.com

Test Package : MOB 2 Certificate 12367 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)

Report Id: EDLMOR [WUSCAR] 06148889 (Generated: 04/24/2024 08:51:05) Rev: 1

Submitted By: LANDON WEBER

T:

F: