

## **OIL ANALYSIS REPORT**

Area **Action Newark** TUG 5600 - TUG

#### Diesel Engine Fluid DIESEL ENGINE OIL SAE 40 (--- GAL)

#### 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 condition of the oil is suitable for further service.

NORMAL

Sample Rating Trend

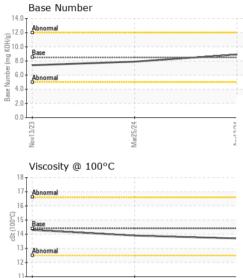
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0924891	WC0850653	WC0864773
Sample Date		Client Info		12 Apr 2024	25 Mar 2024	13 Nov 2023
Machine Age	hrs	Client Info		4892	4881	4764
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	ABNORMAL	NORMAL
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	2	10	12
Chromium	ppm	ASTM D5185m	>20	0	<1	0
Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	2	3
Lead	ppm	ASTM D5185m	>40	0	<1	0
Copper	ppm	ASTM D5185m	>330	0	1	0
Tin	ppm	ASTM D5185m	>15	0	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	250	11	23	12
D 1		ASTM D5185m	10	<1	0	0
Barium	ppm	AGTIVI DUTUUIII			÷	0
Molybdenum	ppm ppm	ASTM D5185m	100	52	59	58
			100	52 0		
Molybdenum	ppm	ASTM D5185m	100 450	-	59	58
Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m		0	59 <1	58 <1
Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	450	0 789	59 <1 811	58 <1 774
Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	450 3000	0 789 1026	59 <1 811 1132	58 <1 774 1098
Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	450 3000 1150	0 789 1026 959	59 <1 811 1132 971	58 <1 774 1098 1003
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	450 3000 1150 1350	0 789 1026 959 1180	59 <1 811 1132 971 1170	58 <1 774 1098 1003 1174
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	450 3000 1150 1350 4250	0 789 1026 959 1180 3712	59 <1 811 1132 971 1170 3226	58 <1 774 1098 1003 1174 3119
Molybdenum 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 ASTM D5185m	450 3000 1150 1350 4250 limit/base	0 789 1026 959 1180 3712 current	59 <1 811 1132 971 1170 3226 history1	58 <1 774 1098 1003 1174 3119 history2
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	450 3000 1150 1350 4250 limit/base >25	0 789 1026 959 1180 3712 current 3	59 <1 811 1132 971 1170 3226 history1 5	58 <1 774 1098 1003 1174 3119 history2 3
Molybdenum 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 ASTM D5185m ASTM D5185m ASTM D5185m	450 3000 1150 1350 4250 imit/base >25 >216	0 789 1026 959 1180 3712 current 3 1	59 <1 811 1132 971 1170 3226 history1 5 1	58 <1 774 1098 1003 1174 3119 history2 3 2
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	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	450 3000 1150 1350 4250 <b>limit/base</b> >25 >216 >20	0 789 1026 959 1180 3712 current 3 1 <1	59 <1 811 1132 971 1170 3226 history1 5 1 3	58 <1 774 1098 1003 1174 3119 history2 3 2 2
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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	450 3000 1150 1350 4250 <b>imit/base</b> >25 >216 >20 <b>imit/base</b>	0 789 1026 959 1180 3712 current 3 1 <1 <1	59 <1 811 1132 971 1170 3226 history1 5 1 3 3 history1	58 <1 774 1098 1003 1174 3119 history2 3 2 2 history2
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 ASTM D5185m	450 3000 1150 1350 4250 <b>Imit/base</b> >25 >216 >20 <b>Imit/base</b> >3	0 789 1026 959 1180 3712 current 3 1 <1 <1 current 0	59 <1 811 1132 971 1170 3226 history1 5 1 3 3 history1 0	58 <1 774 1098 1003 1174 3119 history2 3 2 2 2 history2 0
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	450 3000 1150 1350 4250 <b>imit/base</b> >25 >216 >20 <b>imit/base</b> >3 >20	0 789 1026 959 1180 3712 current 3 1 <1 <1 current 0 4.6	59 <1 811 1132 971 1170 3226 history1 5 1 3 history1 0 6.4	58 <1 774 1098 1003 1174 3119 history2 3 2 2 2 history2 0 8.0
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	450 3000 1150 1350 4250 <b>imit/base</b> >25 >216 >20 <b>imit/base</b> >3 >20 >30	0 789 1026 959 1180 3712 current 3 1 <1 <1 current 0 4.6 16.5	59 <1 811 1132 971 1170 3226 history1 5 1 3 <u>history1</u> 0 6.4 17.0	58 <1 774 1098 1003 1174 3119 history2 3 2 2 history2 0 8.0 17.7



Nov13/23

# **OIL ANALYSIS REPORT**





Mar25/24

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VISUAL		method					history2
Vhite Metal	scalar	*Visual	NONE		NONE	NONE	NONE
ellow Metal	scalar	*Visual	NONE		NONE	NONE	NONE
recipitate	scalar	*Visual	NONE		NONE	NONE	NONE
ilt	scalar	*Visual	NONE		NONE	NONE	NONE
ebris	scalar	*Visual	NONE		NONE	▲ MODER	NONE
and/Dirt	scalar	*Visual	NONE		NONE	NONE	NONE
ppearance	scalar	*Visual	NORM		NORML	NORML	NORML
)dor	scalar	*Visual	NORMI		NORML	NORML	NORML
mulsified Water	scalar	*Visual	>0.2	-	NEG	NEG	NEG
ree Water	scalar	*Visual	20.2		NEG	NEG	NEG
FLUID PROPERT			limit/b	200			_
		method	limit/ba	ase	current	history1	history2
/isc @ 100°C	cSt	ASTM D445	14.4		13.7	13.9	14.3
GRAPHS							
Iron (ppm)				100 <del>т</del>	Lead (ppm)		
Severe				80-	Severe		
				c0.	-		
Abnormal				und 40	Abnormal		
-				20	-		
				0			
3/23 -	5/24 -		Apr12/24 -		3/23 -	5/24 .	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Nov13/23	Mar25/24		Apr1		Nov13/23	Mar25/24	
Aluminum (ppm)					Chromium (p	opm)	
Severa				<sup>50</sup>	Severe		
Severe				40-	Gevele		
Abnomal				e <sup>30</sup> -	Abnormal		
Abnormal				20-	Abholmai		
				10-			
23	24 -		24	01	23	24	VC
Nov13/23	Mar25/24		Apr12/24		Nov13/23	Mar25/24	ACC Lash
Z Copper (ppm)	2		-		Zilicon (ppm)		
				<sup>80</sup> T	Severe		
Severe Pabriormal				60			
				튭 40 -	Abnormal		
				20-			
~	*		+	0			
Nov13/23	Mar25/24		Apr12/24		Nov13/23	Mar25/24	
	Ma		Ap				<
Viscosity @ 100°C				15.0-	Base Numbe	r 	
Abnormal				Base Number (mg KOH/g)	Abnormal		
Base				B <sup>10.0</sup>	Base		
Abnormal	1			-0.5 In	Abnormal		
				ase N			
en	4			0.0		4	e e e e e e e e e e e e e e e e e e e
Nov13/23	Mar25/24		Apr12/24		Nov13/23	Mar25/24	
No	Me.		Ap		No	Ma	<
			NO 07-	10			OTE NEW
earCheck USA - 501 20924891	Madiso Recei		, NC 275 3 Apr 202		IN	110 EVERGREI	-
157433	Teste		Apr 202				NEWARK, N

Centificate 12367 Test Package : MOB 1 (Additional Tests: TBN) 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)

Laboratory Sample No. Lab Number Unique Number

Contact/Location: Robert Witynski - INT110NEW

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