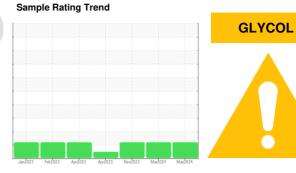


# **OIL ANALYSIS REPORT**

# TRUCK - URBAN **WESTERN STAR M127**

**Diesel Engine** 

SHELL Rotella T5 15W-40 (7 GAL)



### **DIAGNOSIS**

#### Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

#### Wear

All component wear rates are normal.

#### Contamination

Sodium and/or potassium levels are high.

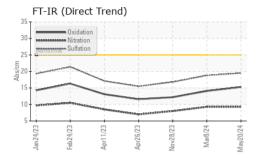
#### **Fluid Condition**

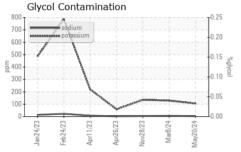
The BN result indicates that there is suitable alkalinity remaining in the oil.

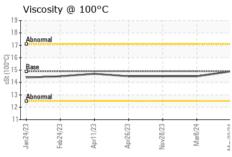
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PE0003328	PE0003279	PE0002383
Sample Date		Client Info		20 May 2024	08 Mar 2024	28 Nov 2023
Machine Age	hrs	Client Info		25096	24570	24283
Oil Age	hrs	Client Info		526	287	513
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
CONTAMINATIO	V	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	9	14	6
Chromium	ppm	ASTM D5185m	>20	<1	2	<1
Nickel	ppm	ASTM D5185m	>4	0	2	0
Titanium	ppm	ASTM D5185m		<1	<1	0
Silver	ppm	ASTM D5185m	>3	<1	<1	0
Aluminum	ppm	ASTM D5185m	>20	5	8	3
Lead	ppm	ASTM D5185m	>40	1	1	0
Copper	ppm	ASTM D5185m	>330	1	2	<1
Tin	ppm	ASTM D5185m	>15	<1	1	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		<1	1	0
ADDITIVES		method	limit/base	current	history1	history2
Doron						0.0
Boron	ppm	ASTM D5185m		18	23	20
Barium	ppm	ASTM D5185m ASTM D5185m		18 0	23	20
Barium	ppm	ASTM D5185m		0	0	2
Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m		0	0 89	2 79
Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		0 80 <1	0 89 1	2 79 0
Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 80 <1 24	0 89 1 18	2 79 0 35
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 80 <1 24 2324	0 89 1 18 2221	2 79 0 35 1929
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		0 80 <1 24 2324 1039	0 89 1 18 2221 1141	2 79 0 35 1929 906
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	limit/base	0 80 <1 24 2324 1039 1213	0 89 1 18 2221 1141 1237	2 79 0 35 1929 906 1065
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	limit/base >25	0 80 <1 24 2324 1039 1213 4150	0 89 1 18 2221 1141 1237 4333	2 79 0 35 1929 906 1065 3851
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		0 80 <1 24 2324 1039 1213 4150 current	0 89 1 18 2221 1141 1237 4333 history1	2 79 0 35 1929 906 1065 3851 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m		0 80 <1 24 2324 1039 1213 4150 current	0 89 1 18 2221 1141 1237 4333 history1	2 79 0 35 1929 906 1065 3851 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	>25	0 80 <1 24 2324 1039 1213 4150 current 6	0 89 1 18 2221 1141 1237 4333 history1 9 6	2 79 0 35 1929 906 1065 3851 history2 8
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	>25	0 80 <1 24 2324 1039 1213 4150 current 6 4	0 89 1 18 2221 1141 1237 4333 history1 9 6 ▲ 129	2 79 0 35 1929 906 1065 3851 history2 8 4
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  method ASTM D5185m	>25 >20	0 80 <1 24 2324 1039 1213 4150 current 6 4 ••••••••••••••••••••••••••••••••••	0 89 1 18 2221 1141 1237 4333 history1 9 6 ▲ 129 NEG	2 79 0 35 1929 906 1065 3851 history2 8 4 135 NEG
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m	>25 >20 limit/base >3	0 80 <1 24 2324 1039 1213 4150 current 6 4 ▲ 105 NEG	0 89 1 18 2221 1141 1237 4333 history1 9 6 ▲ 129 NEG	2 79 0 35 1929 906 1065 3851 history2 8 4 135 NEG history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm	ASTM D5185m *ASTM D7844	>25 >20 limit/base >3	0 80 <1 24 2324 1039 1213 4150 current 6 4 ▲ 105 NEG current 0.3	0 89 1 18 2221 1141 1237 4333 history1 9 6 ▲ 129 NEG history1 0.3	2 79 0 35 1929 906 1065 3851 history2 8 4 135 NEG history2 0.3
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm	ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624	>25 >20 limit/base >3 >20	0 80 <1 24 2324 1039 1213 4150 current 6 4 ▲ 105 NEG current 0.3 9.3	0 89 1 18 2221 1141 1237 4333 history1 9 6 ▲ 129 NEG history1 0.3 9.3	2 79 0 35 1929 906 1065 3851 history2 8 4 135 NEG history2 0.3 8.0
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm	ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7415 *Method	>25 >20 limit/base >3 >20 >30 limit/base	0 80 <1 24 2324 1039 1213 4150 current 6 4 ▲ 105 NEG current 0.3 9.3 19.5 current	0 89 1 18 2221 1141 1237 4333 history1 9 6 ▲ 129 NEG history1 0.3 9.3 18.8 history1	2 79 0 35 1929 906 1065 3851 history2 8 4 135 NEG history2 0.3 8.0 16.8 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm	ASTM D5185m *ASTM D7842 *ASTM D7624 *ASTM D76145	>25 >20 limit/base >3 >20 >30	0 80 <1 24 2324 1039 1213 4150 current 6 4 ▲ 105 NEG current 0.3 9.3 19.5	0 89 1 18 2221 1141 1237 4333 history1 9 6 ▲ 129 NEG history1 0.3 9.3 18.8	2 79 0 35 1929 906 1065 3851 history2 8 4 135 NEG history2 0.3 8.0 16.8

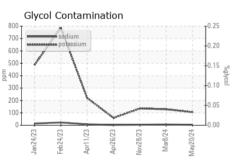


# **OIL ANALYSIS REPORT**









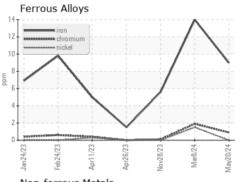
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
ELLID DDODEDI	mathad	limit/booo	ourront.	hiotomut	hiotomyO	
FLUID PROPERTIES		method	limit/base	current	history1	history2

14.5

14.5

14.9

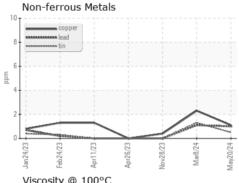
## Visc @ 100°C **GRAPHS**

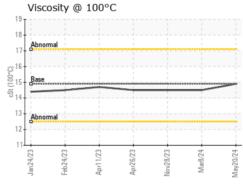


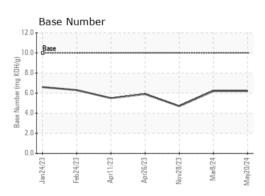
cSt

ASTM D445

14.9











Laboratory Sample No.

Lab Number : 06194845 Unique Number : 11056968

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : PE0003328

Received **Tested** 

: 29 May 2024 : 31 May 2024 Diagnosed

: 31 May 2024 - Sean Felton

PetroCard - Aberdeen 110 Commerce St Aberdeen, WA US 98520 Contact: Sean McNealley

Test Package : CONST (Additional Tests: FT-IR, Glycol, ICP, KV100, SCREEN, TBN) 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: PETABE [WUSCAR] 06194845 (Generated: 05/31/2024 16:43:03) Rev: 1

Submitted By: ED ROZMARYN

smcnealley@petrocard.com

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F: