

### **OIL ANALYSIS REPORT**

#### Sample Rating Trend



#### Machine Id PETERBILT 854576 Component

# Diesel Engine

### SHELL ROTELLA T4 15W40 (--- QTS)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

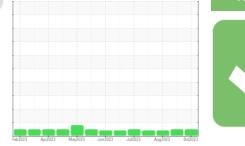
All component wear rates are normal.

#### 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.

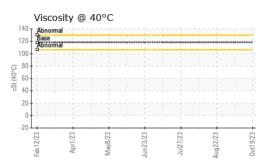


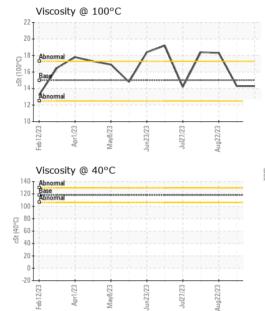


SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0838309	WC0657270	WC0657269
Sample Date		Client Info		19 Oct 2023	10 Sep 2023	22 Aug 2023
Machine Age	mls	Client Info		167452	134881	124694
Oil Age	mls	Client Info		10168	10187	11084
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	ABNORMAL
CONTAMINATION	٧	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	>110	15	19	17
Chromium	ppm	ASTM D5185m	>4	<1	1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	<1
Titanium	ppm	ASTM D5185m		<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	1	0	0
Lead	ppm	ASTM D5185m	>45	1	2	1
Copper	ppm	ASTM D5185m	>85	2	3	3
Tin	ppm	ASTM D5185m	>4	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		<1	<1	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 131	history1 126	history2 90
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	131	126	90
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	131 <1	126 0	90 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	131 <1 1	126 0 1	90 0 6
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	131 <1 1 0	126 0 1 <1	90 0 6 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	131 <1 1 0 15	126 0 1 <1 13	90 0 6 <1 33
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	131 <1 1 0 15 2013	126 0 1 <1 13 2130	90 0 6 <1 33 1832
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	131 <1 1 0 15 2013 897	126 0 1 <1 13 2130 910	90 0 6 <1 33 1832 760
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	limit/base	131 <1 1 0 15 2013 897 1099	126 0 1 <1 2130 910 1150	90 0 6 <1 33 1832 760 959
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		131 <1 1 0 15 2013 897 1099 3395	126 0 1 <1 13 2130 910 1150 3982	90 0 6 <1 33 1832 760 959 3423
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	limit/base	131 <1 1 0 15 2013 897 1099 3395 current	126 0 1 <1 2130 910 1150 3982 history1	90 0 6 <1 33 1832 760 959 3423 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	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	limit/base	131 <1 1 0 15 2013 897 1099 3395 current 3	126 0 1 <1 2130 910 1150 3982 history1 5	90 0 6 <1 33 1832 760 959 3423 history2 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	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	limit/base >30	131 <1 1 0 15 2013 897 1099 3395 current 3 <1	126 0 1 <1 13 2130 910 1150 3982 history1 5 2	90 0 6 <1 33 1832 760 959 3423 history2 4 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >30 >20	131 <1 1 0 15 2013 897 1099 3395 current 3 <1 8	126 0 1 <1 2130 910 1150 3982 history1 5 2 6	90 0 6 <1 33 1832 760 959 3423 history2 4 1 6
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	limit/base >30 >20 limit/base	131 <1 1 0 15 2013 897 1099 3395 current 3 <1 8	126 0 1 <1 13 2130 910 1150 3982 history1 5 2 6 history1	90 0 6 <1 33 1832 760 959 3423 history2 4 1 6 <i>history2</i>
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m	limit/base >30 >20 limit/base >3	131 <1 1 0 15 2013 897 1099 3395 current 3 3 <1 8 current 0.5	126 0 1 <1 13 2130 910 1150 3982 history1 5 2 6 history1 0.5	90 0 6 <1 33 1832 760 959 3423 history2 4 1 6 history2 0.6
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	limit/base >30 >20 limit/base >3 >20	131 <1 1 0 15 2013 897 1099 3395 current 3 3 <1 8 current 0.5 7.1	126 0 1 <1 2130 910 1150 3982 history1 5 2 6 history1 0.5 6.7	90 0 6 <1 33 1832 760 959 3423 history2 4 1 6 <i>history2</i> 0.6 6.7
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 D5185m	Imit/base >30 >20 Imit/base >3 >20 ≥20 ≥3 >20	131 <1 1 0 15 2013 897 1099 3395 current 3 <1 8 current 0.5 7.1 20.6	126 0 1 <1 13 2130 910 1150 3982 history1 5 2 6 <u>history1</u> 0.5 6.7 19.7	90 0 6 <1 33 1832 760 959 3423 history2 4 1 6 <b>history2</b> 0.6 6.7 19.0
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 D7844 *ASTM D7844	limit/base >30 >20 limit/base >3 >20 >30 >30	131 <1 1 0 15 2013 897 1099 3395 current 3 3 <1 8 current 0.5 7.1 20.6 current	126 0 1 <1 2130 910 1150 3982 history1 5 2 6 history1 0.5 6.7 19.7 history1	90 0 6 <1 33 1832 760 959 3423 history2 4 1 6 <i>history2</i> 0.6 6.7 19.0 <i>history2</i>

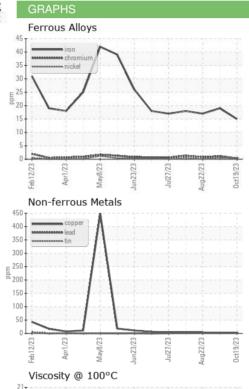


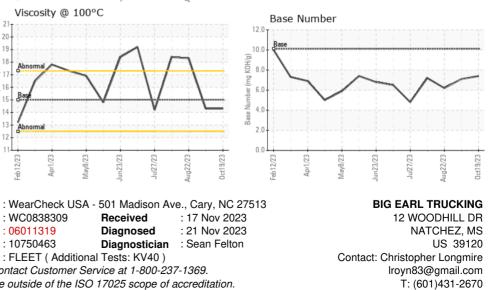
## **OIL ANALYSIS REPORT**





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
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPER	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15	14.3	14.3	<b>1</b> 8.3
GRAPHS						







Test Package : FLEET (Additional Tests: KV40) Certificate L2367 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)

Mav8/23

20 19

18

14

13

12

Laboratory

Sample No.

Lab Number

Unique Number

E

Feb12/23

Apr1/23 .

: WC0838309

:06011319

: 10750463

Submitted By: Christopher Longmire

Page 2 of 2

F: