

OIL ANALYSIS REPORT

1

Area TRUCK - URBAN INTERNATIONAL 91

DIAGNOSIS

Diesel Engine

Recommendation

Resample at the next service interval to monitor.

SHELL Rotella T5 15W-40 (--- GAL)

Wear

Fluid

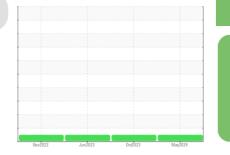
All component wear rates are normal.

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 Rating Trend

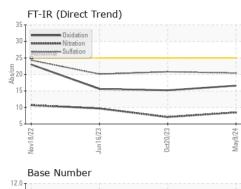


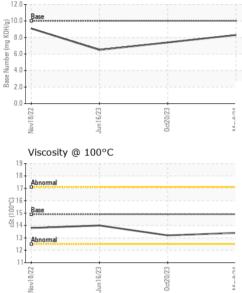
NORMAL

SAMPLE INFORM	1ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PE0003244	PE0001939	PE0001314
Sample Date		Client Info		09 May 2024	20 Oct 2023	16 Jun 2023
Machine Age	hrs	Client Info		3778	3302	2979
Oil Age	hrs	Client Info		476	323	704
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	J	method	limit/base	current	history1	history2
Fuel		WC Method	>2.0	<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
					9	
Iron	ppm	ASTM D5185m	>100	21		19
Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m	0	0	0	
Silver	ppm	ASTM D5185m		0 2	0	0
	ppm	ASTM D5185m	>20			<1
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm		>330	3	3	4
Tin	ppm	ASTM D5185m	>15	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		0	0	0
			11 1. 11			
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	limit/base	44	331	50
Boron Barium		ASTM D5185m ASTM D5185m	limit/base	44 0	331 0	50 0
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	44 0 63	331 0 72	50 0 68
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	44 0 63 <1	331 0 72 <1	50 0 68 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	44 0 63 <1 847	331 0 72 <1 306	50 0 68 0 55
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	44 0 63 <1 847 1304	331 0 72 <1 306 1299	50 0 68 0 55 2169
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	44 0 63 <1 847 1304 1055	331 0 72 <1 306 1299 962	50 0 68 0 55 2169 990
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	limit/base	44 0 63 <1 847 1304 1055 1290	331 0 72 <1 306 1299 962 1114	50 0 68 0 55 2169 990 1187
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		44 0 63 <1 847 1304 1055 1290 3655	331 0 72 <1 306 1299 962 1114 2966	50 0 68 0 55 2169 990 1187 4299
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	44 0 63 <1 847 1304 1055 1290	331 0 72 <1 306 1299 962 1114	50 0 68 0 55 2169 990 1187
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	limit/base	44 0 63 <1 847 1304 1055 1290 3655	331 0 72 <1 306 1299 962 1114 2966	50 0 68 0 55 2169 990 1187 4299 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm 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	44 0 63 <1 847 1304 1055 1290 3655 current	331 0 72 <1 306 1299 962 1114 2966 history1	50 0 68 0 55 2169 990 1187 4299 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	limit/base	44 0 63 <1 847 1304 1055 1290 3655 current 5	331 0 72 <1 306 1299 962 1114 2966 history1 4	50 0 68 0 55 2169 990 1187 4299 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm 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	44 0 63 <1 847 1304 1055 1290 3655 <u>current</u> 5 2	331 0 72 <1 306 1299 962 1114 2966 history1 4 2	50 0 68 0 55 2169 990 1187 4299 history2 3 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20	44 0 63 <1 847 1304 1055 1290 3655 <u>current</u> 5 2 2 2	331 0 72 <1 306 1299 962 1114 2966 history1 4 2 2 <1	50 0 68 0 55 2169 990 1187 4299 history2 3 2 2 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base	44 0 63 <1 847 1304 1055 1290 3655 current 5 2 2 2 2	331 0 72 <1 306 1299 962 1114 2966 history1 4 2 <1 4 1 2 <1	50 0 68 0 55 2169 990 1187 4299 history2 3 2 <1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3	44 0 63 <1 847 1304 1055 1290 3655 <i>current</i> 5 2 2 2 2 <i>current</i> 0.4	331 0 72 <1 306 1299 962 1114 2966 history1 4 2 <1 4 2 <1 history1 0.2	50 0 68 0 55 2169 990 1187 4299 history2 3 2 <1 history2 0.3
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 >25 >20 limit/base >3 >20	44 0 63 <1 847 1304 1055 1290 3655 current 5 2 2 2 current 0.4 8.5	331 0 72 <1 306 1299 962 1114 2966 history1 4 2 <1 4 2 <1 history1 0.2 7.1	50 0 68 0 55 2169 990 1187 4299 history2 3 2 <1 2 <1 history2 0.3 9.7
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 >25 >20 Imit/base >3 >20 >3 >20 >30	44 0 63 <1 847 1304 1055 1290 3655 <u>current</u> 5 2 2 2 2 <u>current</u> 0.4 8.5 20.4	331 0 72 <1 306 1299 962 1114 2966 history1 4 2 <1 4 2 <1 0.2 7.1 20.8	50 0 68 0 55 2169 990 1187 4299 history2 3 2 <1 kistory2 0.3 9.7 20.1
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	limit/base >25 >20 limit/base >3 >20 >30 >30	44 0 63 <1 847 1304 1055 1290 3655 <i>current</i> 5 2 2 2 <i>current</i> 0.4 8.5 20.4 <i>current</i>	331 0 72 <1 306 1299 962 11114 2966 history1 4 2 <1 4 2 <1 history1 0.2 7.1 20.8 history1	50 0 68 0 55 2169 990 1187 4299 history2 3 2 <1 history2 0.3 9.7 20.1 history2

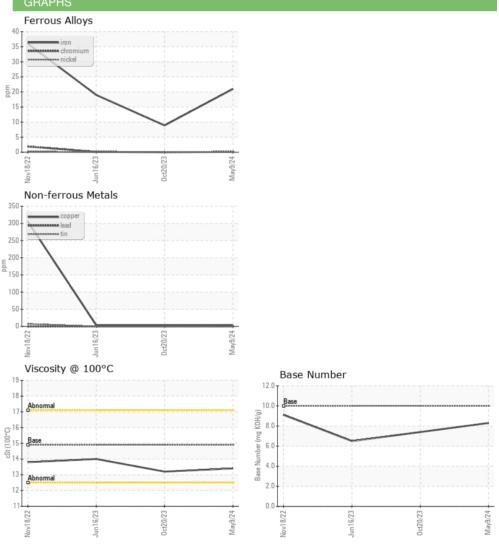


OIL ANALYSIS REPORT





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 PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.9	13.4	13.2	14.0
CDADUS						



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 **PetroCard - Aberdeen** Sample No. : PE0003244 Received : 17 May 2024 110 Commerce St Lab Number : 06183604 Tested : 21 May 2024 Aberdeen, WA US 98520 Unique Number : 11034930 Diagnosed : 21 May 2024 - Sean Felton Test Package : CONST (Additional Tests: FT-IR, ICP, KV100, SCREEN, TBN) Contact: Sean McNealley Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. smcnealley@petrocard.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Т: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

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Submitted By: ED ROZMARYN

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