



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	MARGINAL
FLUID CONDITION	NORMAL

Area
TRUCK - URBAN
Machine Id
WESTERN STAR 99
Component
Diesel Engine
Fluid
SHELL Rotella T5 15W-40 (7 GAL)

RECOMMENDATION

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		PE0003249	PE0001934	PE0001315
Sample Date		Client Info		16 May 2024	27 Sep 2023	23 Jun 2023
Machine Age	hrs	Client Info		5424	4921	4376
Oil Age	hrs	Client Info		503	545	473
Filter Age	hrs	Client Info		503	545	473
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				MARGINAL	ABNORMAL	ABNORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>75	19	16	16
Chromium	ppm	ASTM D5185m	>5	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	0	<1
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>15	3	0	2
Lead	ppm	ASTM D5185m	>25	<1	<1	<1
Copper	ppm	ASTM D5185m	>100	<1	1	<1
Tin	ppm	ASTM D5185m	>4	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

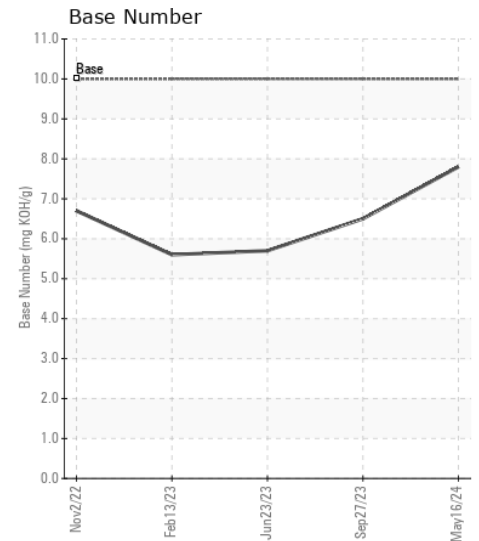
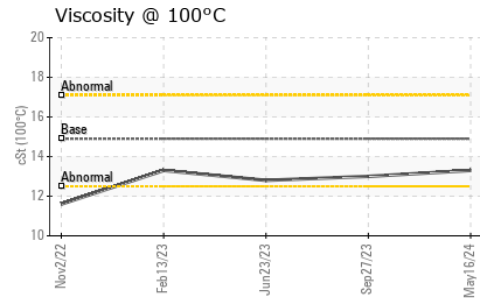
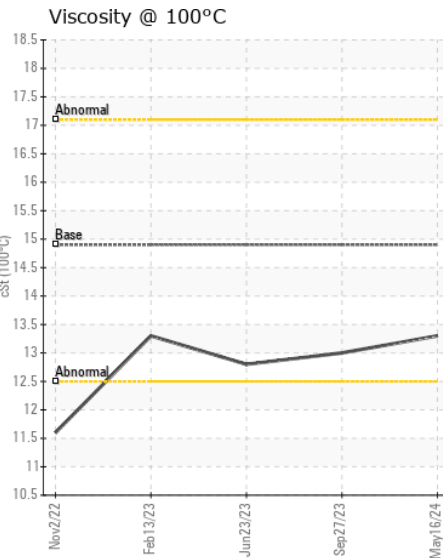
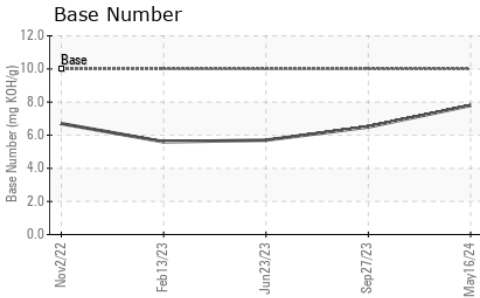
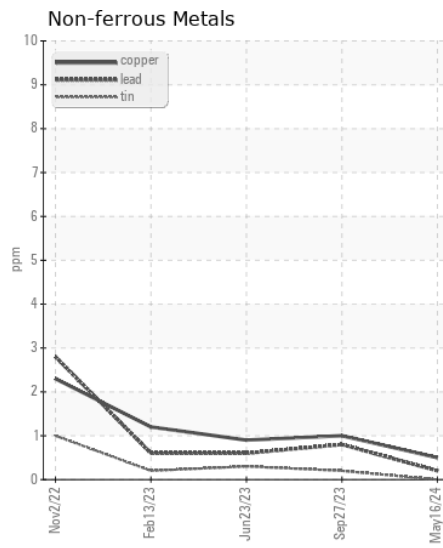
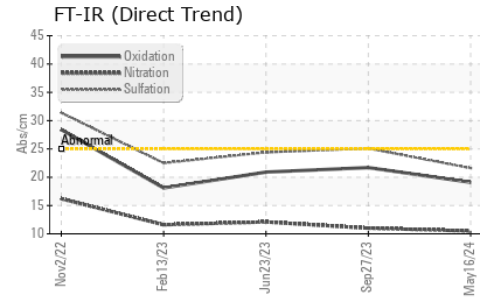
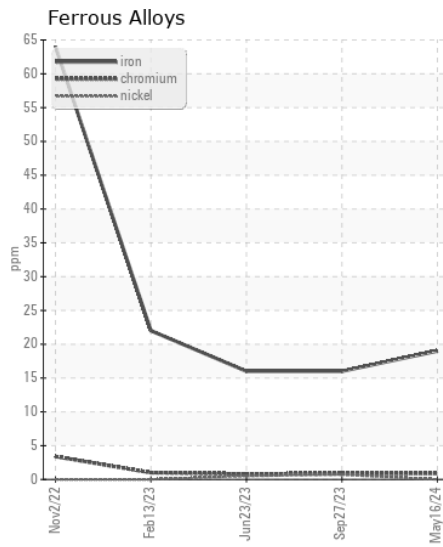
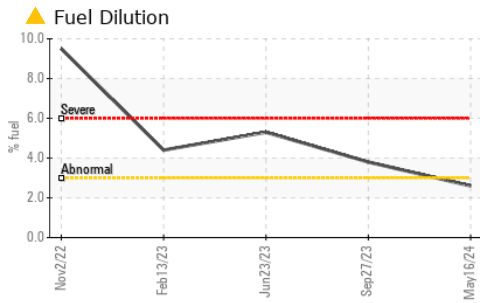
Light fuel dilution occurring.

Silicon	ppm	ASTM D5185m	>25	5	6	5
Potassium	ppm	ASTM D5185m	>20	16	3	3
Fuel	%	ASTM D3524	>3.0	▲ 2.6	▲ 3.8	▲ 5.3
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>6	0.8	1	1
Nitration	Abs/cm	*ASTM D7624	>20	10.5	11.0	12.1
Sulfation	Abs/.1mm	*ASTM D7415	>30	21.6	25.1	24.4
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

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

Sodium	ppm	ASTM D5185m		2	0	<1
Boron	ppm	ASTM D5185m		23	123	24
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		68	85	81
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m		868	334	53
Calcium	ppm	ASTM D5185m		1376	1367	2042
Phosphorus	ppm	ASTM D5185m		1183	972	940
Zinc	ppm	ASTM D5185m		1455	1191	1136
Sulfur	ppm	ASTM D5185m		4021	3632	3580
Oxidation	Abs/.1mm	*ASTM D7414	>25	19.1	21.7	20.9
Base Number (BN)	mg KOH/g	ASTM D2896	10	7.8	6.5	5.7
Visc @ 100°C	cSt	ASTM D445	14.9	13.3	13.0	12.8



Certificate L2367

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

Sample No. : PE0003249

Lab Number : 06193225

Unique Number : 11049977

Test Package : CONST (Additional Tests: FT-IR, ICP, KV100, PercentFuel, SCREEN, TBN

Received : 28 May 2024

Tested : 30 May 2024

Diagnosed : 30 May 2024 - Sean Felton

PetroCard - Aberdeen

110 Commerce St

Aberdeen, WA

US 98520

Contact: ED ROZMARYN

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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)

T:

F: