



OIL ANALYSIS REPORT

WEAR	ABNORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Area
NADINE URCIUOLI [TOM LARKEY]

Machine Id
VOLVO PENTA 4110132121

Component
Center Gasoline Engine

Fluid
VOLVO 10W40 (4 LTR)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		VPA054895	---	---
Sample Date		Client Info		15 Apr 2024	---	---
Machine Age	hrs	Client Info		0	---	---
Oil Age	hrs	Client Info		0	---	---
Filter Age	hrs	Client Info		0	---	---
Oil Changed		Client Info		Changed	---	---
Filter Changed		Client Info		Changed	---	---
Sample Status				ABNORMAL	---	---

WEAR

Iron and nickel ppm levels are abnormal. Aluminum ppm levels are noted.

Iron	ppm	ASTM D5185m	>150	▲ 230	---	---
Chromium	ppm	ASTM D5185m	>20	8	---	---
Nickel	ppm	ASTM D5185m	>5	▲ 7	---	---
Titanium	ppm	ASTM D5185m		<1	---	---
Silver	ppm	ASTM D5185m	>2	0	---	---
Aluminum	ppm	ASTM D5185m	>40	● 22	---	---
Lead	ppm	ASTM D5185m	>50	26	---	---
Copper	ppm	ASTM D5185m	>155	40	---	---
Tin	ppm	ASTM D5185m	>10	5	---	---
Vanadium	ppm	ASTM D5185m		0	---	---
White Metal	scalar	*Visual	NONE	NONE	---	---
Yellow Metal	scalar	*Visual	NONE	NONE	---	---

CONTAMINATION

Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

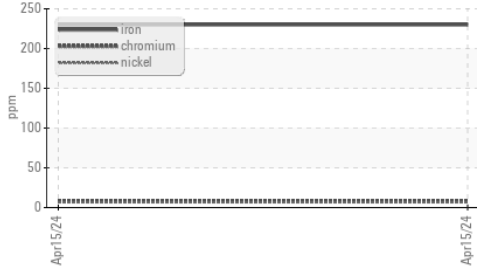
Silicon	ppm	ASTM D5185m	>30	▲ 116	---	---
Potassium	ppm	ASTM D5185m	>20	9	---	---
Fuel		WC Method	>4.0	<1.0	---	---
Water		WC Method	>0.1	NEG	---	---
Glycol		WC Method		NEG	---	---
Soot %	%	*ASTM D7844		0.1	---	---
Nitration	Abs/cm	*ASTM D7624	>20	14.0	---	---
Sulfation	Abs/.1mm	*ASTM D7415	>30	33.7	---	---
Silt	scalar	*Visual	NONE	NONE	---	---
Debris	scalar	*Visual	NONE	NONE	---	---
Sand/Dirt	scalar	*Visual	NONE	NONE	---	---
Appearance	scalar	*Visual	NORML	NORML	---	---
Odor	scalar	*Visual	NORML	NORML	---	---
Emulsified Water	scalar	*Visual	>0.1	NEG	---	---

FLUID CONDITION

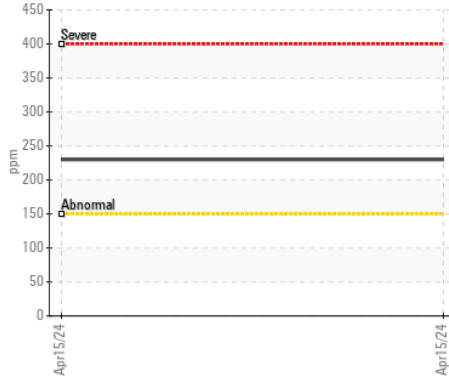
The BN result indicates that there is suitable alkalinity remaining in the oil.

Sodium	ppm	ASTM D5185m		44	---	---
Boron	ppm	ASTM D5185m		17	---	---
Barium	ppm	ASTM D5185m		0	---	---
Molybdenum	ppm	ASTM D5185m		52	---	---
Manganese	ppm	ASTM D5185m		8	---	---
Magnesium	ppm	ASTM D5185m		170	---	---
Calcium	ppm	ASTM D5185m		2295	---	---
Phosphorus	ppm	ASTM D5185m		1050	---	---
Zinc	ppm	ASTM D5185m		1417	---	---
Sulfur	ppm	ASTM D5185m		3859	---	---
Oxidation	Abs/.1mm	*ASTM D7414	>25	22.9	---	---
Base Number (BN)	mg KOH/g	ASTM D2896		9.3	---	---
Visc @ 100°C	cSt	ASTM D445		13.1	---	---

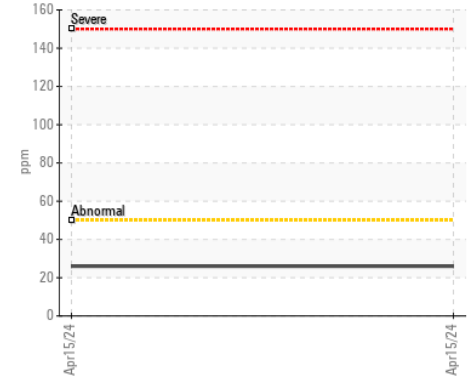
▲ Ferrous Alloys



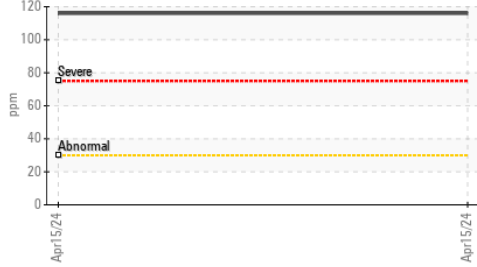
▲ Iron (ppm)



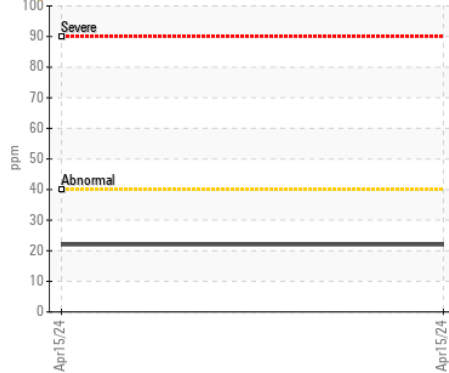
Lead (ppm)



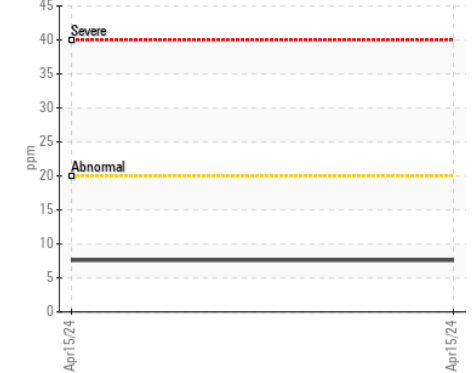
▲ Silicon (ppm)



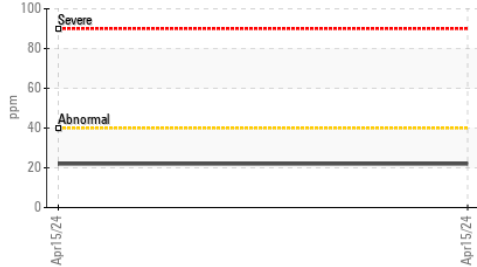
● Aluminum (ppm)



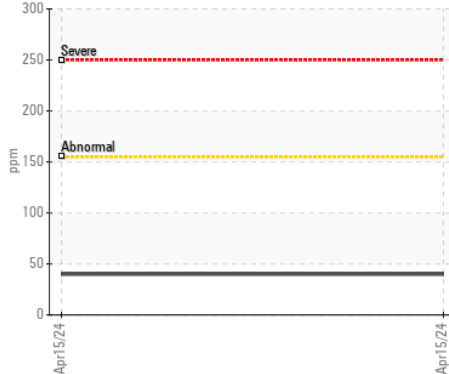
Chromium (ppm)



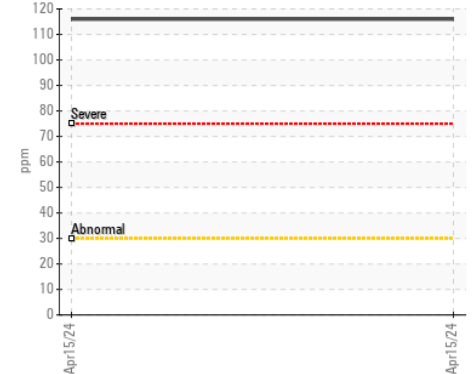
● Aluminum (ppm)



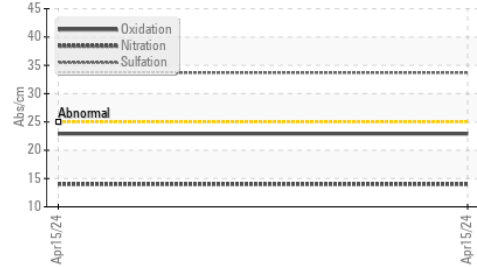
Copper (ppm)



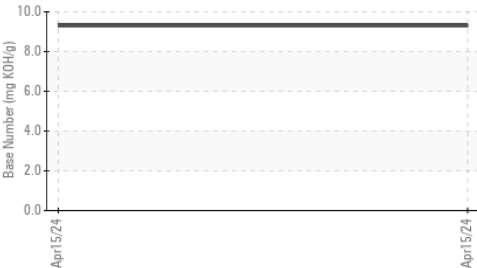
▲ Silicon (ppm)



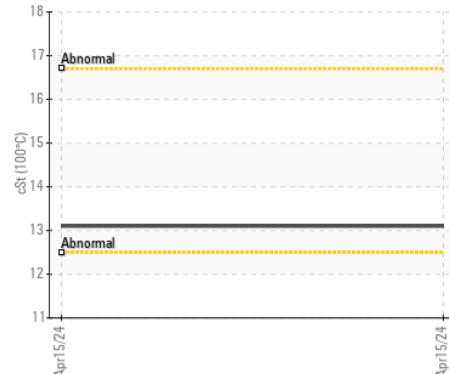
FT-IR (Direct Trend)



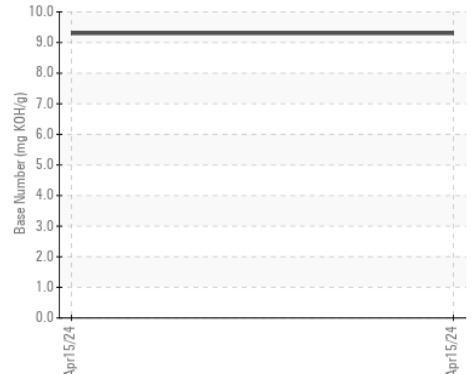
Base Number



Viscosity @ 100°C



Base Number



Certificate L2367

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

Sample No. : VPA054895

Lab Number : 06158684

Unique Number : 10994107

Test Package : MOB 1 (Additional Tests: TBN)

Received : 24 Apr 2024

Tested : 25 Apr 2024

Diagnosed : 25 Apr 2024 - Angela Borella

Helmuts Marine Service

619 Canal Street

SAN RAFAEL, CA

US 94901-3545

Contact: NADINE URUIOLI

SERVICE@HELMUTSMARINE.COM

T: x:

F: x:

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)