

OIL ANALYSIS REPORT

**VOLVO
PENTA**

4 FROGS 51662 - STARBOARD DIESEL ENGINE

Sample No: VPA058242

Oil Type: SHELL ROTELLA T 15W40

SAMPLE INFORMATION

Sample Number	VPA058242	VPA044660	VPA032083	---
Sample Date	17 Nov 2023	04 Nov 2022	04 Oct 2021	---
Machine Hours	572	399	0	---
Oil Hours	172	111	0	---
Oil Changed	Changed	Changed	Not Changd	---
Sample Status	MARGINAL	ABNORMAL	ATTENTION	---

OIL CONDITION

Visc @ 100°C	cSt	13.6	13.8	13.7	---
Base Number (BN)	mg KOH/g	7.3	7.9	---	---
Oxidation (PA)	%	70	72	75	---

CONTAMINATION

Water	%	NEG	NEG	NEG	---
Soot %	%	0.2	0.2	0.2	---
Nitration (PA)	%	64	70	69	---
Sulfation (PA)	%	58	60	61	---
Glycol	%	NEG	NEG	NEG	---
Fuel	%	<1.0	<1.0	<1.0	---
Silicon	ppm	3	3	2	---
Sodium	ppm	0	2	2	---
Potassium	ppm	9	8	9	---

WEAR METALS

Iron	ppm	11	15	15	---
Copper	ppm	▲ 119	▲ 161	▲ 125	---
Lead	ppm	0	4	1	---
Tin	ppm	0	<1	<1	---
Aluminum	ppm	1	3	2	---
Chromium	ppm	<1	<1	<1	---
Molybdenum	ppm	0	1	1	---
Nickel	ppm	0	<1	1	---
Titanium	ppm	0	0	<1	---
Silver	ppm	0	0	<1	---
Manganese	ppm	0	<1	<1	---
Vanadium	ppm	0	0	<1	---

ADDITIVES

Calcium	ppm	2069	2397	2214	---
Magnesium	ppm	11	25	14	---
Zinc	ppm	1104	1306	1242	---
Phosphorus	ppm	955	1052	981	---
Barium	ppm	3	0	0	---
Boron	ppm	189	179	183	---

The Talaria Company

202 Banks St., One Little Harbor Landing
OXFORD, MD

US 21654

Contact: TRACY PELLERIN

tpellerin@hinckleyyachts.com

T: (410)770-4899

F: x:

Diagnosis

No corrective action is recommended at this time. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). Metal levels are typical for a new component breaking in. There is no indication of any contamination in the oil. The condition of the oil is acceptable for the time in service.

Depot: VP592286

Unique No: 10778826

Signed: Doug Bogart

Report Date: 11 Dec 2023

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GRAPHS

