

# OIL ANALYSIS REPORT

# VOLVO PENTA

## VOLVO PENTA 1013544477 - STARBOARD DIESEL ENGINE

Sample No: VPA020025

Oil Type: CHEVRON DELO 400 LE 15W40

### SAMPLE INFORMATION

Sample Number	VPA020025	VPA020421	VPA020779	VPA014008
Sample Date	22 Aug 2023	17 May 2023	06 Jan 2023	24 Oct 2022
Machine Hours	6000	5489	5006	4450
Oil Hours	500	483	530	497
Oil Changed	Changed	Changed	Changed	Changed
Sample Status	ABNORMAL	ABNORMAL	ABNORMAL	NORMAL

### CHARLESTON NAVIGATION

6 CONCORD STREET  
CHARLESTON, SC  
US 29401  
Contact: David Matash  
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### OIL CONDITION

Visc @ 100°C	cSt	▲ 11.7	▲ 11.5	▲ 11.6	■ 12.7
Base Number (BN)	mg KOH/g	■ 5.6	■ 6.8	■ 6.2	■ 8.0
Oxidation (PA)	%	■ 65	■ 69	■ 67	■ 73

### CONTAMINATION

Soot %	%	■ 0.9	■ 0.6	■ 0.9	■ 1.2
Nitration (PA)	%	■ 72	■ 73	■ 75	■ 81
Sulfation (PA)	%	■ 64	■ 64	■ 64	■ 71
Glycol	%	■ NEG	■ NEG	■ NEG	■ NEG
Fuel	%	▲ 6.8	▲ 6.0	▲ 5.4	<1.0
Silicon	ppm	■ 7	■ 8	■ 6	■ 7
Sodium	ppm	■ 2	■ 2	■ 2	■ 1
Potassium	ppm	■ 6	■ 16	■ 13	■ 0

### WEAR METALS

Iron	ppm	■ 23	■ 18	■ 24	■ 22
Copper	ppm	■ 4	■ 3	■ 2	■ 3
Lead	ppm	■ 4	■ 4	■ 3	■ 1
Tin	ppm	■ 1	■ <1	■ <1	■ <1
Aluminum	ppm	■ 8	■ 8	■ 11	■ 4
Chromium	ppm	■ <1	■ <1	■ <1	■ 2
Molybdenum	ppm	■ 81	■ 113	■ 95	■ 95
Nickel	ppm	■ 0	■ <1	■ <1	■ 0
Titanium	ppm	■ 0	■ <1	■ 0	■ 0
Silver	ppm	■ 0	■ 0	■ 0	■ 0
Manganese	ppm	■ <1	■ <1	■ <1	■ 1
Vanadium	ppm	■ 0	■ 0	■ 0	■ <1

### ADDITIVES

Calcium	ppm	■ 1298	■ 1340	■ 1356	■ 1472
Magnesium	ppm	■ 410	■ 540	■ 495	■ 645
Zinc	ppm	■ 1168	■ 798	■ 959	■ 866
Phosphorus	ppm	■ 935	■ 650	■ 755	■ 700
Barium	ppm	■ 0	■ 0	■ 0	■ 0
Boron	ppm	■ 88	■ 134	■ 127	■ 171

### Diagnosis

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. All component wear rates are normal. There is a moderate amount of fuel present in the oil. Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

Depot: VPCHACHA  
Unique No: 10629293  
Signed: Doug Bogart  
Report Date: 31 Aug 2023

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## GRAPHS

