

OIL ANALYSIS REPORT



MR. KENNETH R WINTER KEN YANMAR M56092 - STARBOARD DIESEL ENGINE

Sample No: VPA047518
Oil Type: CITGO CITGUARD 600 15W40

SAMPLE INFORMATION

Sample Number	VPA047518	VPA047511	VPA040140	VPA040147
Sample Date	10 Nov 2023	02 Jun 2023	08 Feb 2023	03 Nov 2022
Machine Hours	4901	4735	4514	4456
Oil Hours	165	299	58	363
Oil Changed	Not Changd	Changed	Not Changd	Changed
Sample Status	MARGINAL	ABNORMAL	NORMAL	ABNORMAL

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 536 UNION LN
 BRIELLE, NJ
 US 08730-1421
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OIL CONDITION

Visc @ 100°C	cSt	▲ 12.3	▲ 12.2	■ 13.1	■ 12.6
Base Number (BN)	mg KOH/g	■ 8.4	■ 7.6	■ 8.9	■ 8.8
Oxidation (PA)	%	64	73	57	72

CONTAMINATION

Water	%	NEG	NEG	NEG	NEG
Soot %	%	■ 0.1	■ 0.2	■ 0.1	■ 0.1
Nitration (PA)	%	57	68	52	83
Sulfation (PA)	%	54	56	51	59
Glycol	%	NEG	NEG	NEG	NEG
Fuel	%	▲ 3.2	▲ 4.1	<1.0	▲ 2.8
Silicon	ppm	■ 3	■ 3	■ 3	■ 2
Sodium	ppm	■ 0	■ 4	■ 3	■ 18
Potassium	ppm	■ 2	■ 3	■ 3	■ 4

Diagnosis

No corrective action is recommended at this time. Resample at the next service interval to monitor. All component wear rates are normal. Light fuel dilution occurring. Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

WEAR METALS

Iron	ppm	■ 3	■ 3	■ 1	■ 3
Copper	ppm	■ 70	▲ 126	■ 55	▲ 142
Lead	ppm	■ 0	■ <1	■ 1	■ <1
Tin	ppm	■ 0	■ 1	■ <1	■ <1
Aluminum	ppm	■ 1	■ 1	■ <1	■ 1
Chromium	ppm	■ 0	■ <1	■ 0	■ <1
Molybdenum	ppm	■ 58	■ 55	■ 53	■ 51
Nickel	ppm	■ <1	■ 1	■ 0	■ 2
Titanium	ppm	■ <1	■ 0	■ 0	■ 0
Silver	ppm	■ 0	■ <1	■ 0	■ 2
Manganese	ppm	■ 0	■ <1	■ <1	0
Vanadium	ppm	0	<1	0	<1

ADDITIVES

Calcium	ppm	■ 1657	■ 1863	■ 1872	■ 2006
Magnesium	ppm	■ 352	■ 374	■ 349	■ 262
Zinc	ppm	■ 1157	■ 1336	■ 1227	■ 1256
Phosphorus	ppm	■ 1011	■ 1080	■ 985	■ 1049
Barium	ppm	■ 0	■ 0	■ 0	■ 0
Boron	ppm	■ 2	■ 17	■ 21	■ 88

Depot: VP153457
Unique No: 10750530
Signed: Jonathan Hester
Report Date: 24 Nov 2023

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VOLVO PENTA

GRAPHS

