

OIL ANALYSIS REPORT



MR. KENNETH R WINTER YANMAR M61138 - STARBOARD DIESEL ENGINE

Sample No: VPA036336
Oil Type: CITGO CITGUARD 600 15W40

SAMPLE INFORMATION

Sample Number	VPA036336	VPA047518	VPA047511	VPA040140
Sample Date	24 Apr 2024	10 Nov 2023	02 Jun 2023	08 Feb 2023
Machine Hours	5027	4901	4735	4514
Oil Hours	291	165	299	58
Oil Changed	Changed	Not Changd	Changed	Not Changd
Sample Status	ABNORMAL	MARGINAL	ABNORMAL	NORMAL

Monmouth Marine Engines Inc
 536 UNION LN
 BRIELLE, NJ
 US 08730-1421
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OIL CONDITION

Visc @ 100°C	cSt	▲ 11.9	▲ 12.3	▲ 12.2	■ 13.1
Base Number (BN)	mg KOH/g	■ 8.3	■ 8.4	■ 7.6	■ 8.9
Oxidation (PA)	%	69	64	73	57

CONTAMINATION

Water	%	NEG	NEG	NEG	NEG
Soot %	%	■ 0.2	■ 0.1	■ 0.2	■ 0.1
Nitration (PA)	%	68	57	68	52
Sulfation (PA)	%	55	54	56	51
Glycol	%	NEG	NEG	NEG	NEG
Fuel	%	▲ 3.0	▲ 3.2	▲ 4.1	<1.0
Silicon	ppm	■ 3	■ 3	■ 3	■ 3
Sodium	ppm	■ 2	■ 0	■ 4	■ 3
Potassium	ppm	■ 2	■ 2	■ 3	■ 3

WEAR METALS

Iron	ppm	■ 5	■ 3	■ 3	■ 1
Copper	ppm	▲ 182	■ 70	▲ 126	■ 55
Lead	ppm	■ <1	■ 0	■ <1	■ 1
Tin	ppm	■ <1	■ 0	■ 1	■ <1
Aluminum	ppm	■ 1	■ 1	■ 1	■ <1
Chromium	ppm	■ <1	■ 0	■ <1	■ 0
Molybdenum	ppm	■ 57	■ 58	■ 55	■ 53
Nickel	ppm	■ <1	■ <1	■ 1	■ 0
Titanium	ppm	■ <1	■ <1	■ 0	■ 0
Silver	ppm	■ <1	■ 0	■ <1	■ 0
Manganese	ppm	■ 0	■ 0	■ <1	■ <1
Vanadium	ppm	<1	0	<1	0

ADDITIVES

Calcium	ppm	■ 1640	■ 1657	■ 1863	■ 1872
Magnesium	ppm	355	■ 352	■ 374	■ 349
Zinc	ppm	■ 1170	■ 1157	■ 1336	■ 1227
Phosphorus	ppm	■ 938	■ 1011	■ 1080	■ 985
Barium	ppm	■ 0	■ 0	■ 0	■ 0
Boron	ppm	■ 3	■ 2	■ 17	■ 21

Diagnosis

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. 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). 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.

Depot: VP153457
Unique No: 11045487
Signed: Sean Felton
Report Date: 28 May 2024

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VOLVO PENTA

GRAPHS

