

OIL ANALYSIS REPORT

Kenova [Kenova] Oil - Starboard Main Engine

Component **Port Main Engine** MOBIL 15W40 (150 GAL)

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Adam fields)

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





Sample Rating Trend

Machine Age hrs Client Info 37435 36966 36526 Oil Age hrs Client Info 222 6366 5900 Oil Changed Client Info Changed Not Changed NORIMAL Sample Status Image current Norison NORIMAL CONTAMINATION method Image current Nistory1 Nistory2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Glycol uw WC Method >4.0 <1.0 <1.0 MEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 4 38 34 Chromium ppm ASTM D5185m >8 <1 <1 <1 Irtanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >16 1 1 <1 1 1 Co	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
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Fuel WC Method >4.0 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 4 38 34 Chromium ppm ASTM D5185m >2 <1 0 <1 Nickel ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >18 <1 16 11 2 Lead ppm ASTM D5185m >18 <1 16 11 2 Cadmium ppm ASTM D5185m >80 7 93 98 11 2 Cadmium ppm ASTM D5185m >14 <1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CONTAMINATION	N .	method	limit/base	current	history1	history2
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Iron ppm ASTM D5185m >75 4 38 34 Chromium ppm ASTM D5185m >8 <1 <1 <1 Nickel ppm ASTM D5185m >2 <1 0 <1 Titanium ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >18 <1 16 11 2 Lead ppm ASTM D5185m >18 <1 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 0 0 0 Catamium pm ASTM D5185m <11 0 0 2 52 52 52 52 52 52 52 52 52 52 52 52 52	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >8 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 <1	Iron	ppm	ASTM D5185m	>75	4	38	34
Titanium ppm ASTM D5185m >3 <1	Chromium	ppm	ASTM D5185m	>8	<1	<1	<1
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >15 4 1 2 Lead ppm ASTM D5185m >18 <1 16 11 Copper ppm ASTM D5185m >80 7 93 98 Tin ppm ASTM D5185m >14 <1 1 <1 Vanadium ppm ASTM D5185m >14 <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m clos 52 52 Barium ppm ASTM D5185m 100 <1 <1 Magnese ppm ASTM D5185m 614 636 580 Calcium ppm ASTM D5185m 726 704 680 Zinc pp	Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Aluminum ppm ASTM D5185m >15 4 1 2 Lead ppm ASTM D5185m >18 <1 16 11 Copper ppm ASTM D5185m >80 7 93 98 Tin ppm ASTM D5185m >14 <1 1 <1 Vanadium ppm ASTM D5185m >14 <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 200 52 52 Barium ppm ASTM D5185m 200 54 1 Molybdenum ppm ASTM D5185m 100 <1 <1 Magnesium ppm ASTM D5185m 614 636 580 Calcium ppm ASTM D5185m 726 704 680 Zinc ppm	Titanium	ppm	ASTM D5185m	>3	<1	0	0
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Copper ppm ASTM D5185m >80 7 93 98 Tin ppm ASTM D5185m >14 <1 1 <1 Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 200 52 52 Barium ppm ASTM D5185m <1 0 2 Molybdenum ppm ASTM D5185m <10 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 20 14 4 5 Solicon ppm ASTM D5185m 20	Aluminum	ppm	ASTM D5185m	>15	4	1	2
In ppm ASTM D5185m >14 <1	Lead	ppm	ASTM D5185m	>18	<1	16	11
Vanadium ppm ASTM D5185m <1	Copper	ppm	ASTM D5185m	>80	7	93	98
Cadmium ppm ASTM D5185m <1	Tin	ppm	ASTM D5185m	>14	<1	1	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 200 52 52 Barium ppm ASTM D5185m 200 52 52 Barium ppm ASTM D5185m 100 58 57 Manganese ppm ASTM D5185m 0 <1 <1 Magnesium ppm ASTM D5185m 614 636 580 Calcium ppm ASTM D5185m 614 636 580 Calcium ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 3336 2498 2655 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m 20 2 </th <th>Vanadium</th> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th><1</th> <td>0</td> <td>0</td>	Vanadium	ppm	ASTM D5185m		<1	0	0
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Barium ppm ASTM D5185m <1	ADDITIVES		method	limit/base	current	history1	history2
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Manganese ppm ASTM D5185m 0 <1	Barium	ppm	ASTM D5185m		<1	0	2
Magnesium ppm ASTM D5185m 614 636 580 Calcium ppm ASTM D5185m 1477 1638 1607 Phosphorus ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 856 867 847 Sulfur ppm ASTM D5185m 3336 2498 2655 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/.mm *A	Molybdenum	ppm	ASTM D5185m		100	58	57
Calcium ppm ASTM D5185m 1477 1638 1607 Phosphorus ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 856 867 847 Sulfur ppm ASTM D5185m 3336 2498 2655 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7415 >30 20.4 25.6 26.3	Manganese	ppm	ASTM D5185m		0	<1	<1
Phosphorus ppm ASTM D5185m 726 704 680 Zinc ppm ASTM D5185m 856 867 847 Sulfur ppm ASTM D5185m 3336 2498 2655 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >20 14 3 2 Potassium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7415 >30 20.4 25.6 26.3	Magnesium	ppm	ASTM D5185m		614	636	580
Zinc ppm ASTM D5185m 856 867 847 Sulfur ppm ASTM D5185m 3336 2498 2655 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >20 14 3 2 Potassium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.Imm *ASTM D7415 >30 20.4 25.6 26.3	Calcium	ppm	ASTM D5185m		1477	1638	1607
Sulfur ppm ASTM D5185m 3336 2498 2655 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >118 4 3 2 Potassium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3	Phosphorus	ppm	ASTM D5185m		726	704	680
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >118 4 3 2 Potassium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3	Zinc	ppm	ASTM D5185m		856	867	847
Silicon ppm ASTM D5185m >20 14 4 5 Sodium ppm ASTM D5185m >118 4 3 2 Potassium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.Imm *ASTM D7415 >30 20.4 25.6 26.3	Sulfur	ppm	ASTM D5185m		3336	2498	2655
Sodium ppm ASTM D5185m >118 4 3 2 Potassium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3	Silicon	ppm	ASTM D5185m	>20	14	4	5
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3		ppm	ASTM D5185m	>118	4	3	2
Soot % % *ASTM D7844 0.1 0.7 0.7 Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3	Potassium	ppm	ASTM D5185m	>20	2	1	2
Nitration Abs/cm *ASTM D7624 >20 6.2 12.2 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.4 25.6 26.3	inter for the b	0/	*ASTM D7844		0.1	0.7	0.7
		%					
	Soot %		*ASTM D7624	>20	6.2	12.2	12.6
FLUID DEGRADATION method limit/base current history1 history2	Soot % Nitration	Abs/cm					
Oxidation Abs/.1mm *ASTM D7414 >25 15.5 24.5 24.5	Soot % Nitration Sulfation	Abs/cm Abs/.1mm			20.4	25.6	26.3
Base Number (BN) mg KOH/g ASTM D2896 13.54 6.73 6.96	Soot % Nitration Sulfation FLUID DEGRADA	Abs/cm Abs/.1mm	*ASTM D7415 method	>30 limit/base	20.4 current	25.6 history1	26.3 history2



13 Abnorma

12

12000

1000

800 Water (ppm) 600

400

2000 Ab

0

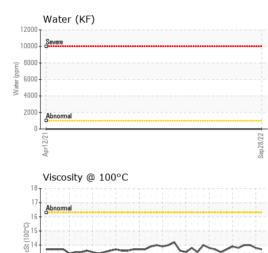
Apr12/21

eb25/20

Water (KF)

ah15/71

OIL ANALYSIS REPORT



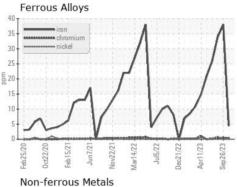
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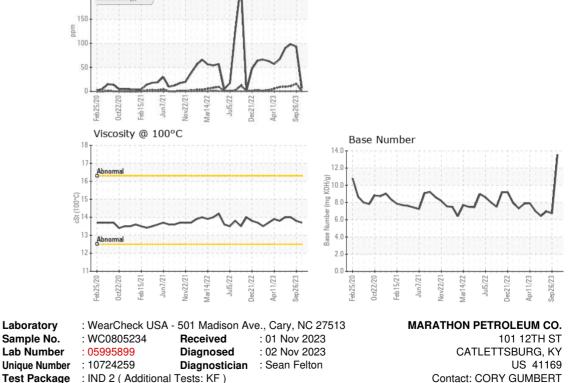
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VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPER	TIES	method	limit/base	current	history1	history2
					· · · · · ·	,
Visc @ 100°C	cSt	ASTM D445		13.7	13.8	14.0
GRAPHS						

250

200





Test Package : IND 2 (Additional Tests: KF) Certificate L2367 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)

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