

OIL ANALYSIS REPORT

Area Garyville [Garyville] Oil - Starboard Genset Component

Starboard Genset SHELL ROTELLA T 15W40 (35 GAL)

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Top Up Amount: 1 GAL)

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.

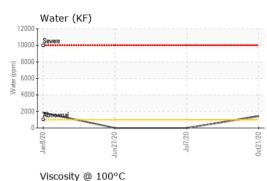


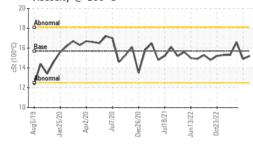
Sample Rating Trend

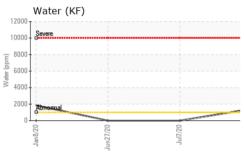
Sample Date Client Info 26 Sep 2023 29 Aug 2023 04 Jul 2 Machine Age hrs Client Info 16013 11571 11571 Oil Age hrs Client Info 500 903 903 Oil Changed Client Info Oil Added Oil Added Oil Added Oil Added Sample Status NortMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 hist Fuel WC Method >4.0 <1.0 <1.0 <1.0 Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 hist Iron ppm ASTM D5185m >50 7 8 20 0 Chromium ppm ASTM D5185m >2 0 0 0 0 Aluminum ppm ASTM D5185m >12 1 <1 <1 1		histo				method		SAMPLE INFORM
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Titanium ppm ASTM D5185m 6 3 <1		<1	<1	<1	>4	ASTM D5185m	ppm	Chromium
Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >12 1 <1 <1 Lead ppm ASTM D5185m >17 <1 <1 3 Copper ppm ASTM D5185m >70 <1 <1 3 Tin ppm ASTM D5185m >70 <1 <1 3 Cadmium ppm ASTM D5185m >15 <1 0 0 Vanadium ppm ASTM D5185m >15 <1 0 0 Vanadium ppm ASTM D5185m >15 <1 0 0 Vanadium ppm ASTM D5185m 16 82 95 62 Barium ppm ASTM D5185m 316 82 95 62 Barium ppm ASTM D5185m 1.2 26 21 19 Manganese ppm ASTM D5185m 24 758 57		0	0	0	>2	ASTM D5185m	ppm	Nickel
Aluminum ppm ASTM D5185m >12 1 <1 <1 Lead ppm ASTM D5185m >17 <1 <1 3 Copper ppm ASTM D5185m >70 <1 <1 3 Tin ppm ASTM D5185m >15 <1 0 0 Vanadium ppm ASTM D5185m >15 <1 0 0 Vanadium ppm ASTM D5185m >15 <1 <1 <1 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 hist Boron ppm ASTM D5185m 316 82 95 62 Barium ppm ASTM D5185m 0.0 0 0 0 Molybdenum ppm ASTM D5185m 1.2 26 21 19 Manganese ppm ASTM D5185m 24 758 574 573 Calcium ppm ASTM D5185m 1064 976		<1	3	6		ASTM D5185m	ppm	Titanium
Lead ppm ASTM D5185m >17 <1		0	0	0	>5	ASTM D5185m	ppm	Silver
Copper ppm ASTM D5185m >70 <1		<1	<1	1	>12	ASTM D5185m	ppm	Aluminum
Tin ppm ASTM D5185m >15 <1		3	<1	<1	>17	ASTM D5185m	ppm	Lead
Vanadium ppm ASTM D5185m <1		3	<1	<1	>70	ASTM D5185m	ppm	Copper
CadmiumppmASTM D5185m000ADDITIVESmethodlimit/basecurrenthistory1histBoronppmASTM D5185m316829562BariumppmASTM D5185m0.0000MolybdenumppmASTM D5185m1.2262119ManganeseppmASTM D5185m<<1<1<1MagnesiumppmASTM D5185m24758574573CalciumppmASTM D5185m2292191318401799PhosphorusppmASTM D5185m1064976880860ZincppmASTM D5185m1160120710851111SulfurppmASTM D5185m4996382039133579CONTAMINANTSmethodlimit/basecurrenthistory1hist		0	0	<1	>15	ASTM D5185m	ppm	Tin
ADDITIVES method limit/base current history1 hist Boron ppm ASTM D5185m 316 82 95 62 Barium ppm ASTM D5185m 0.0 0 0 0 Molybdenum ppm ASTM D5185m 1.2 26 21 19 Manganese ppm ASTM D5185m <<1 <1 <1 <1 Magnesium ppm ASTM D5185m 24 758 574 573 Calcium ppm ASTM D5185m 2292 1913 1840 1799 Phosphorus ppm ASTM D5185m 1064 976 880 860 Zinc ppm ASTM D5185m 1160 1207 1085 11111 Sulfur ppm ASTM D5185m 4996 3820 3913 3579 CONTAMINANTS method limit/base current history1 hist		<1	<1	<1		ASTM D5185m	ppm	Vanadium
Boron ppm ASTM D5185m 316 82 95 62 Barium ppm ASTM D5185m 0.0 0 0 0 0 Molybdenum ppm ASTM D5185m 1.2 26 21 19 Manganese ppm ASTM D5185m 1.2 26 21 19 Magnesium ppm ASTM D5185m 24 758 574 573 Calcium ppm ASTM D5185m 2292 1913 1840 1799 Phosphorus ppm ASTM D5185m 1064 976 880 860 Zinc ppm ASTM D5185m 1160 1207 1085 1111 Sulfur ppm ASTM D5185m 4996 3820 3913 3579 CONTAMINANTS method limit/base current history1 hist		0	0	0		ASTM D5185m	ppm	Cadmium
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Manganese ppm ASTM D5185m <1		0	0	0	0.0	ASTM D5185m	ppm	Barium
Magnesium ppm ASTM D5185m 24 758 574 573 Calcium ppm ASTM D5185m 2292 1913 1840 1799 Phosphorus ppm ASTM D5185m 1064 976 880 860 Zinc ppm ASTM D5185m 1160 1207 1085 1111 Sulfur ppm ASTM D5185m 4996 3820 3913 3579 CONTAMINANTS method limit/base current history1 hist		19	21	26	1.2	ASTM D5185m	ppm	Molybdenum
Calcium ppm ASTM D5185m 2292 1913 1840 1799 Phosphorus ppm ASTM D5185m 1064 976 880 860 Zinc ppm ASTM D5185m 1160 1207 1085 1111 Sulfur ppm ASTM D5185m 4996 3820 3913 3579 CONTAMINANTS method limit/base current history1 hist		<1	<1	<1		ASTM D5185m	ppm	Manganese
Phosphorus ppm ASTM D5185m 1064 976 880 860 Zinc ppm ASTM D5185m 1160 1207 1085 1111 Sulfur ppm ASTM D5185m 4996 3820 3913 3579 CONTAMINANTS method limit/base current history1 hist	3	573	574	758	24	ASTM D5185m	ppm	Magnesium
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SulfurppmASTM D5185m4996382039133579CONTAMINANTSmethodlimit/basecurrenthistory1hist)	860	880	976	1064	ASTM D5185m	ppm	Phosphorus
CONTAMINANTS method limit/base current history1 hist	11	1111	1085	1207	1160	ASTM D5185m	ppm	Zinc
	79	3579	3913	3820	4996	ASTM D5185m	ppm	Sulfur
Silicon ppm ASTM D5185m >25 6 5 8	istory2							
					>25		ppm	Silicon
Sodium ppm ASTM D5185m 1 3 3								
Potassium ppm ASTM D5185m >20 4 3 3		3	3	4	>20	ASTM D5185m	ppm	Potassium
INFRA-RED method limit/base current history1 hist	istory2	histo	history1	current	limit/base	method		INFRA-RED
Soot % % *ASTM D7844 0.2 0.2 0.5						*ASTM D7844		
Nitration Abs/cm *ASTM D7624 >20 9.5 9.7 12.0	0	12.0	9.7	9.5	>20	*ASTM D7624	Abs/cm	Nitration
Sulfation Abs/.1mm *ASTM D7415 >30 20.3 21.0 25.1	1	25.1	21.0	20.3	>30	*ASTM D7415	Abs/.1mm	Sulfation
FLUID DEGRADATION method limit/base current history1 hist	istory2	histo	history1	current	limit/base	method	TION	FLUID DEGRADA
Ovidation Abo/1mm *ACTM D7414 . 05 17.0 17.0 05.0	2	05.0	17.9	17.2	>25	*ASTM D7414	Abs/.1mm	Oxidation
Oxidation Abs/.1mm *ASTM D7414 >25 17.2 17.9 25.3 Base Number (BN) mg KOH/g ASTM D2896 10.1 9.89 10.41 8.89	3	20.0						



OIL ANALYSIS REPORT







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	ΓIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.7	15.2	14.9	16.6
CRADUS						

Ferrous Alloys

Non-ferrous Metals

180 160 140

12

Laboratory

Sample No.

Lab Number

Unique Number

Aug5/19

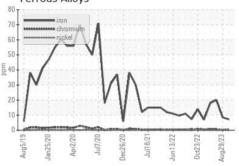
Jan 75/70

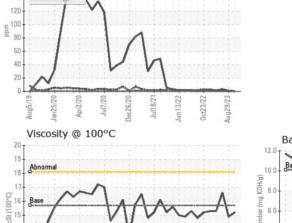
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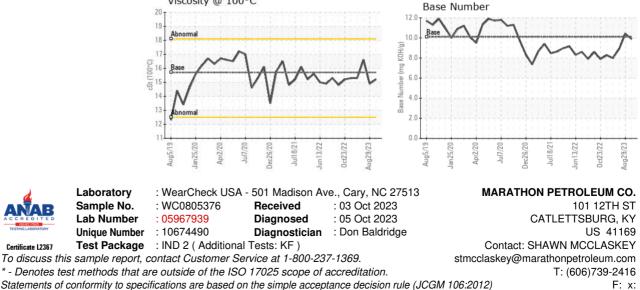
Test Package : IND 2 (Additional Tests: KF)

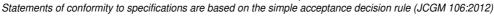
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: 10674490









Apr2/20

Dec26/20

Received

Diagnosed

un13/22

Certificate L2367

Submitted By: M/V GARYVILLE

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