



ENDEAVOR (S/N 2WB11168)

Starboard Main Engine Fluid SHELL ROTELLA T 30 (--- QTS)

COMPONENT CONDITION SUMMARY



RECON	MEND	ATION

Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS							
Sample Status				ATTENTION	NORMAL	NORMAL	
Visc @ 100°C	cSt	ASTM D445	11.5	13.57	12.0	11.9	

Customer Id: CITSANUS Sample No.: WC0834566 Lab Number: 05903914 Test Package: MAR 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Doug Bogart +1 (800)237-1369 x4016 <u>dougb@wearcheckusa.com</u>

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS

06 Jan 2023 Diag: Sean Felton



Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

05 Dec 2022 Diag: Angela Borella





Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





OIL ANALYSIS REPORT

Sample Rating Trend

VISCOSITY

ENDEAVOR (S/N 2WB11168)

Starboard Main Engine

SHELL ROTELLA T 30 (--- QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

The oil viscosity is higher than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0834566	WC0754324	WC0754320
Sample Date		Client Info		06 Jul 2023	06 Jan 2023	05 Dec 2022
Machine Age	hrs	Client Info		13761	12985	12824
Oil Age	hrs	Client Info		200	200	12568
Oil Changed		Client Info		Not Changd	Not Changd	N/A
Sample Status				ATTENTION	NORMAL	NORMAL
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	maa	ASTM D5185m	>75	6	6	6
Chromium	ppm	ASTM D5185m	>8	0	<1	0
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>3	1	9	10
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>15	1	1	0
Lead	ppm	ASTM D5185m	>18	<1	<1	0
Copper	ppm	ASTM D5185m	>80	<1	2	2
Tin	ppm	ASTM D5185m	>14	0	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 342	history1 59	history2 62
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 0	current 342 1	history1 59 0	history2 62 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0	current 342 1 81	history1 59 0 48	history2 62 0 47
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0	current 342 1 81 0	history1 59 0 48 <1	history2 62 0 47 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0	Current 342 1 81 0 381	history1 59 0 48 <1 525	history2 62 0 47 <1 497
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 1890	current 342 1 81 0 381 1664	history1 59 0 48 <1 525 1625	history2 62 0 47 <1 497 1577
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	methodASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185m	limit/base 0 0 1890 680	Current 342 1 81 0 381 1664 1056	history1 59 0 48 <1 525 1625 737	history2 62 0 47 <1 497 1577 696
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	methodASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185m	limit/base 0 0 1890 680 750	Current 342 1 81 0 381 1664 1056 1233	history1 59 0 48 <1 525 1625 737 911	history2 62 0 47 <1 497 1577 696 818
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	methodASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185m	limit/base 0 0 1890 680 750	Current 342 1 81 0 381 1664 1056 1233 3498	history1 59 0 48 <1 525 1625 737 911 4222	history2 62 0 47 <1 497 1577 696 818 4304
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 1890 680 750 limit/base	Current 342 1 81 0 381 1664 1056 1233 3498 Current	history1 59 0 48 <1 525 1625 737 911 4222 history1	history2 62 0 47 <1 497 1577 696 818 4304 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 0 0 1890 680 750 limit/base >20	current 342 1 81 0 381 1664 1056 1233 3498 current 3	history1 59 0 48 <1 525 1625 737 911 4222 history1 3	history2 62 0 47 <1 497 1577 696 818 4304 history2 3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 0 0 1890 680 750 limit/base >20 >75	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 0 0 1890 680 750 limit/base >20 >75 >20	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 2	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 0 0 1890 680 750 limit/base >20 >75 >20 limit/base	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2 current	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 history1	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 0 0 1890 680 750 limit/base >20 >75 >20 limit/base	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2 current 0.1	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 history1 0.1	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3 history2 0.1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	<pre>limit/base 0 1890 680 750 limit/base >20 >75 >20 limit/base</pre>	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2 current 0.1 6.5	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 history1 0.1 7.8	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3 history2 0.1 8.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7844 *ASTM D7624	<pre>limit/base 0</pre>	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2 current 0.1 6.5 20.5	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 history1 0.1 7.8 17.5	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3 history2 0.1 8.4 18.5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	<pre>limit/base 0 1890 1890 680 750 limit/base >20 20 limit/base >20 s20 limit/base </pre>	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2 current 0.1 6.5 20.5	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 history1 0.1 7.8 17.5 history1	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3 history2 0.1 8.4 18.5 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7844 *ASTM D7415 method *ASTM D7414	<pre>limit/base 0 1890 680 750 limit/base >20 >75 >20 limit/base >20 s30 limit/base</pre>	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2 current 0.1 6.5 20.5 current 15.9	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 history1 0.1 7.8 17.5 history1 12.9	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3 history2 0.1 8.4 18.5 history2 13.1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation Base Number (BN)	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7624 *ASTM D7624 *ASTM D7414 *ASTM D7414 ASTM D2896	limit/base 0 0 0 0 0 1890 680 750 limit/base >20 >75 >20 limit/base >20	current 342 1 81 0 381 1664 1056 1233 3498 current 3 0 2 current 0.1 6.5 20.5 current 15.9 9.19	history1 59 0 48 <1 525 1625 737 911 4222 history1 3 2 history1 0.1 7.8 17.5 history1 12.9 7.8 12.9 7.8	history2 62 0 47 <1 497 1577 696 818 4304 history2 3 1 3 history2 0.1 8.4 18.5 history2 13.1 9.3



OIL ANALYSIS REPORT

VISUAL





Janb 23	White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water FLUID PROPEF Visc @ 100°C	scalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visualscalar*Visual	NONENONENONENONENONENONENONENONENONENONENONENORMLNORMLNORML>0.1NEGImit/basecurrent11.513.57	NONE NONE NONE NONE NONE NONE NORML NORML NEG NEG history1 12.0	NONE NONE NONE NONE NONE NORML NORML NEG NEG history2 11.9
Jan 6/23	GRAPHS Ferrous Alloys	ecc guer als	Juliciza		
Labo Sam Lab Uniqu Certificate 12367 Test	Pratory : WearCheck USA - be Number : 05903914 be Number : 10565270 Package : MAR 2	501 Madison Ave., Ca Received : 20, Diagnosed : 27, Diagnostician : Dou	ry, NC 27513 CITY bul 2023 bg Bogart	ber EXPERIENCES - SEAW 2825 SA Contact: Se	ARD EXPLORER 5TH AVENUE ND DIEGO, CA US 92103 rvice Manager
* - Denotes test meth Statements of conform	nods that are outside of the ISO nots that are outside of the ISO nity to specifications are based on	17025 scope of accred the simple acceptance of	itation. lecision rule (JCGM 106:20	012)	T: F:

method limit/base

current

history1 history2

Contact/Location: Service Manager - CITSANUS