

OIL ANALYSIS REPORT

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Sample Rating Trend

NORMAL

Area SEAWARD ENDEAVOR Machine Id Endeavor - PME Component

Port Main Engine Fluid SHELL ROTELLA T 30 (160 GAL)

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.

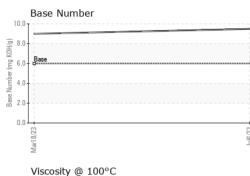
Fluid Condition

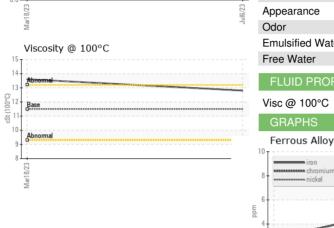
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

		-	Mar2023	Jul2023		
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0779528	WC0779534	
Sample Date		Client Info		06 Jul 2023	18 Mar 2023	
Machine Age	hrs	Client Info		13761	13207	
Oil Age	hrs	Client Info		700	480	
Oil Changed		Client Info		Not Changd	Not Changd	
Sample Status				NORMAL	NORMAL	
CONTAMINATION	J	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	
Water		WC Method	>0.1	NEG	NEG	
Glycol		WC Method	,	NEG	NEG	
WEAR METALS		method	limit/base	current	history1	history2
Iron	nom	ASTM D5185m	>75	7	3	
Chromium	ppm	ASTM D5185m		0		
	ppm		>8		<1	
Nickel	ppm	ASTM D5185m	>2	0	0	
Titanium	ppm		>3	4	3	
Silver	ppm	ASTM D5185m	>2	<1	0	
Aluminum	ppm	ASTM D5185m	>15	1	<1	
Lead	ppm	ASTM D5185m	>18	0	0	
Copper	ppm	ASTM D5185m	>80	<1	<1	
Tin	ppm	ASTM D5185m	>14	0	0	
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		0	0	
Gaaman	ppin	AGTIVI DOTODITI		U	0	
ADDITIVES	ppin	method	limit/base	current	history1	history2
	ppm		limit/base	-	-	
ADDITIVES		method		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m		current 135	history1 132	history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 135 1	history1 132 0	history2
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0	current 135 1 72	history1 132 0 56	history2
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0	current 135 1 72 <1	history1 132 0 56 <1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0	current 135 1 72 <1 509	history1 132 0 56 <1 463	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 1890 680	Current 135 1 72 <1 509 2141	history1 132 0 56 <1 463 1767	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 1890	Current 135 1 72 <1 509 2141 1185	history1 132 0 56 <1 463 1767 1007	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 1890 680	Current 135 1 72 <1 509 2141 1185 1371	history1 132 0 56 <1 463 1767 1007 1207	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	0 0 1890 680 750	Current 135 1 72 <1 509 2141 1185 1371 4561	history1 132 0 56 <1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 1890 680 750 Iimit/base >20	current 135 1 72 <1 509 2141 1185 1371 4561 current 3	history1 132 0 56 <1	history2 history2 history2
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 ASTM D5185m	0 0 1890 680 750	Current 135 1 72 <1 509 2141 1185 1371 4561 Current	history1 132 0 56 <1 463 1767 1007 1207 4078 history1	history2
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	0 0 1890 680 750 limit/base >20 >75	current 135 1 72 <1 509 2141 1185 1371 4561 current 3 0	history1 132 0 56 <1 463 1767 1007 1207 4078 history1 4 <1	history2
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	0 0 1890 680 750 limit/base >20 >75 >20	current 135 1 72 <1 509 2141 1185 1371 4561 current 3 0 2 current	history1 132 0 56 <1	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm	method ASTM D5185m	0 0 1890 680 750 limit/base >20 >75 >20 limit/base	current 135 1 72 <1 509 2141 1185 1371 4561 current 3 0 2 current 0.2	history1 132 0 56 <1	history2 history2 history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 1890 680 750 limit/base >20 >75 >20 limit/base	current 135 1 72 <1 509 2141 1185 1371 4561 current 3 0 2 current	history1 132 0 56 <1 463 1767 1007 1207 4078 history1 4 <1 <1 <1 history1	history2 history2 history2 history2 history2
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	0 0 1890 680 750 imit/base >20 >75 >20 imit/base >20 >20	current 135 1 72 <1 509 2141 1185 1371 4561 current 3 0 2 current 0.2 7.0	history1 132 0 56 <1 463 1767 1007 1207 4078 history1 4 <1 4 <1 0.1 5.8	history2 history2 history2 history2 history2 <
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D76185m *ASTM D7624 *ASTM D7624 *ASTM D7415 method	0 0 1890 680 750 1 1 20 220 220 20 20 20 230 1 1 1 1 20 20 20 20 20 20 20 20 20 20	current 135 1 72 <1 509 2141 1185 1371 4561 current 3 0 2 current 0.2 7.0 18.9 current	history1 132 0 56 <1 463 1767 1007 1207 4078 history1 4 <1 4 <1 0.1 5.8 18.3 history1	history2 history2 history2 history2 history2 history2 history2
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 D5185m	0 0 1890 680 750 limit/base >20 limit/base >20 limit/base >20	current 135 1 72 <1 509 2141 1185 1371 4561 current 3 0 2 current 0.2 7.0 18.9	history1 132 0 56 <1 463 1767 1007 1207 4078 history1 4 <1 <1 0.1 5.8 18.3	history2 history2 history2



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	VISUAL		method	limit/base	current	history1	history2
	White Metal	scalar	*Visual	NONE	NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE	NONE	
	Silt	scalar	*Visual	NONE	NONE	NONE	
	Debris	scalar	*Visual	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Jul6/23	Appearance	scalar	*Visual	NORML	NORML	NORML	
- -	Odor	scalar	*Visual	NORML	NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	
	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPER	TIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	11.5	12.8	13.6	
	GRAPHS						
	Ferrous Alloys						
	iron						
	8 - nickel						
	6 -						
	Edd						
	4-						
	2						
	22	************		Jul6/23			
	Mar1 8/23			Jul			
	Non-ferrous Meta	ls					
	10 copper]						
	8 -						
	6+						
	4						
	2						
	2						
				53			
	Mar1 8/23			Jul6/23			
	≥ Viscosity @ 100°(_					
	¹⁵				Base Number		
	14						
	13 -			(B/H	0		
	12 Bare			0X Br. 6.	0 - Base		
100	Base 11-			.8 Base Number (mg KOH/g)			
	10			4. N 82	0		
	Abnormal 9 -			<u>2</u> .	0-		
	8			0.	0		
	Mar18/23 -			Jul6/23	Mar18/23		Jul6/23 -
	Mar			Ļ	Mar		٦٢
Laboratory	: WearCheck USA -	501 Madi			3	SEAWA	RD SERVICES
Sample No.		Recieve		Jul 2023			222 PEARL ST
Lab Number Unique Number	5			Jul 2023 Jg Bogart		NE	W ALBANY, IN US 47150
Test Package	: MAR 2	Diagnos		ig Dogan	C	ontact: PETER (
	contact Customer Serv		300-237-1369	Э.		BONNET@HMS-	



 Certificate 12367
 Test Package
 : MAR 2
 Contact

 To discuss this sample report, contact Customer Service at 1-800-237-1369.
 PCHARBONI

 * - 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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