

# **OIL ANALYSIS REPORT**

Findlay [Findlay] Oil - Starboard Genset

**Starboard Genset** 

**MARATHON 15W40 (8 GAL)** 

Sample Rating Trend



## **DIAGNOSIS**

### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the

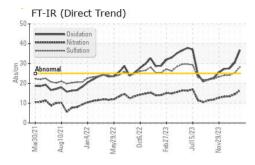
### Fluid Condition

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

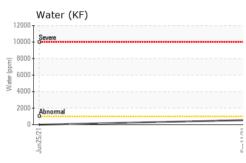
SAMPLE INFORM	1ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0874733	WC0859878	WC0859885
Sample Date		Client Info		19 Mar 2024	23 Feb 2024	24 Jan 2024
Machine Age	hrs	Client Info		10172	9589	9385
Oil Age	hrs	Client Info		3348	2765	2561
Oil Changed	1110	Client Info		Filtered	Not Changd	Filtered
Sample Status		Olioni illio		ABNORMAL	NORMAL	NORMAL
CONTAMINATION	ı	method	limit/base	current	history1	history2
	V	WC Method	>4.0	<1.0	<1.0	<1.0
Fuel Glycol		WC Method	>4.0	<1.0 NEG	<1.0 NEG	<1.0 NEG
WEAR METALS		method	limit/base	-		-
				current	history1	history2
Iron	ppm	ASTM D5185m	>50	17	11	9
Chromium	ppm	ASTM D5185m	>4	<1	0	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	_	0	0	<1
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>12	1	0	<1
Lead	ppm	ASTM D5185m	>17	0	0	<1
Copper	ppm		>70	3	3	<1
Tin	ppm	ASTM D5185m	>15	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVE O						
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 26	history1 22	history2 21
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	26	22	21
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	26 0	22	21
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	26 0 52	22 0 48	21 0 53
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	26 0 52 <1	22 0 48 0	21 0 53 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	26 0 52 <1 1265	22 0 48 0 1319	21 0 53 <1 1357
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	26 0 52 <1 1265 1372	22 0 48 0 1319 1433	21 0 53 <1 1357 1304
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	26 0 52 <1 1265 1372 1077	22 0 48 0 1319 1433 964	21 0 53 <1 1357 1304 1045
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	26 0 52 <1 1265 1372 1077	22 0 48 0 1319 1433 964 1254	21 0 53 <1 1357 1304 1045 1303
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	26 0 52 <1 1265 1372 1077 1282 3598	22 0 48 0 1319 1433 964 1254 3553	21 0 53 <1 1357 1304 1045 1303 3261
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	26 0 52 <1 1265 1372 1077 1282 3598 current	22 0 48 0 1319 1433 964 1254 3553 history1	21 0 53 <1 1357 1304 1045 1303 3261 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	26 0 52 <1 1265 1372 1077 1282 3598 current	22 0 48 0 1319 1433 964 1254 3553 history1 2	21 0 53 <1 1357 1304 1045 1303 3261 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >20	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6	22 0 48 0 1319 1433 964 1254 3553 history1 2 3	21 0 53 <1 1357 1304 1045 1303 3261 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >20	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6 1	22 0 48 0 1319 1433 964 1254 3553 history1 2 3 0	21 0 53 <1 1357 1304 1045 1303 3261 history2 3 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >20 >0.1	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6 1 NEG	22 0 48 0 1319 1433 964 1254 3553 history1 2 3 0 NEG	21 0 53 <1 1357 1304 1045 1303 3261 history2 3 4 0 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304	limit/base >25 >20 >0.1 limit/base	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6 1 NEG current 0.3	22 0 48 0 1319 1433 964 1254 3553 history1 2 3 0 NEG	21 0 53 <1 1357 1304 1045 1303 3261 history2 3 4 0 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304  method *ASTM D7844	limit/base >25 >20 >0.1 limit/base >20	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6 1 NEG	22 0 48 0 1319 1433 964 1254 3553 history1 2 3 0 NEG history1 0.3	21 0 53 <1 1357 1304 1045 1303 3261 history2 3 4 0 NEG history2 0.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304  method  *ASTM D7844  *ASTM D7844	limit/base >25 >20 >0.1 limit/base >20	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6 1 NEG current 0.3 16.5	22 0 48 0 1319 1433 964 1254 3553 history1 2 3 0 NEG history1 0.3 14.5	21 0 53 <1 1357 1304 1045 1303 3261 history2 3 4 0 NEG history2 0.2 13.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304  method  *ASTM D7844  *ASTM D7624  *ASTM D7415  method	limit/base >25 >20 >0.1 limit/base >20 >30 limit/base	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6 1 NEG current 0.3 16.5 28.3 current	22 0 48 0 1319 1433 964 1254 3553 history1 2 3 0 NEG history1 0.3 14.5 25.3 history1	21 0 53 <1 1357 1304 1045 1303 3261 history2 3 4 0 NEG history2 0.2 13.4 24.1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304  method  *ASTM D7844  *ASTM D7624  *ASTM D76145	limit/base >25 >20 >0.1 limit/base >20 >30 limit/base	26 0 52 <1 1265 1372 1077 1282 3598 current 3 6 1 NEG current 0.3 16.5 28.3	22 0 48 0 1319 1433 964 1254 3553 history1 2 3 0 NEG history1 0.3 14.5 25.3	21 0 53 <1 1357 1304 1045 1303 3261 history2 3 4 0 NEG history2 0.2 13.4 24.1

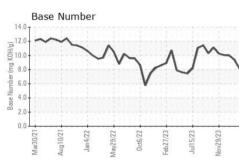


## **OIL ANALYSIS REPORT**



	12000 -	Water (KF)	
	10000	Severe	
m)	8000		
Water (ppm)	6000-		
M	4000		
	2000 -	Abnormal	
	0 -	Jun25/21 Jun25/21	
		un C	

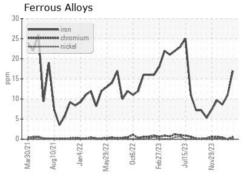


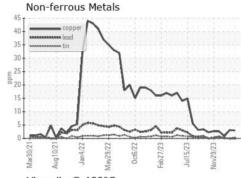


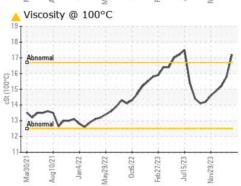
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

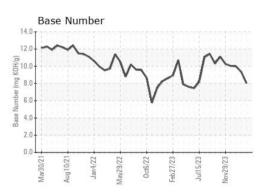
FLUID PROPERTIES		method	limit/base	current	history1	history2	
Visc @ 100°C	cSt	ASTM D445	_	17.2	15.8	15.2	

### **GRAPHS**













Certificate 12367

Laboratory Sample No.

: WC0874733 Lab Number : 06140123 Unique Number : 10964931

: WearCheck USA - 501 Madison Ave., Cary, NC 27513

Test Package : IND 2 ( Additional Tests: KF )

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

Received **Tested** Diagnosed

: 05 Apr 2024 : 09 Apr 2024

: 09 Apr 2024 - Sean Felton

MARATHON PETROLEUM CO. 101 12TH ST CATLETTSBURG, KY US 41169

Contact: SHAWN MCCLASKEY stmcclaskey@marathonpetroleum.com T: (606)739-2416

\* - 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)

F: x: Submitted By: M/V FINDLAY