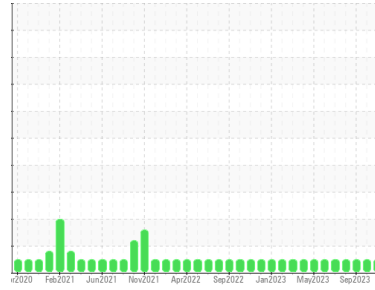




# OIL ANALYSIS REPORT

Sample Rating Trend



**NORMAL**



Area  
**Nashville**  
 Machine Id  
**[Nashville] Oil - Starboard Main Engine**  
 Component  
**Starboard Main Engine**  
 Fluid  
**MOBIL 15W40 (150 GAL)**

## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: oil was changed 140 hrs ago )

### 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 INFORMATION		method	limit/base	current	history1	history2
Sample Number	Client Info			<b>WC0805236</b>	WC0805253	WC0769329
Sample Date	Client Info			<b>27 Nov 2023</b>	03 Oct 2023	05 Sep 2023
Machine Age	hrs	Client Info		<b>56827</b>	56190	55760
Oil Age	hrs	Client Info		<b>140</b>	5241	4815
Oil Changed	Client Info			<b>Filtered</b>	Not Changd	Filtered
Sample Status				<b>NORMAL</b>	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel	WC Method	>4.0		<b>&lt;1.0</b>	<1.0	<1.0
Glycol	WC Method			<b>NEG</b>	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	<b>&lt;1</b>	11	10
Chromium	ppm	ASTM D5185m	>8	<b>0</b>	<1	<1
Nickel	ppm	ASTM D5185m	>2	<b>&lt;1</b>	0	<1
Titanium	ppm	ASTM D5185m	>3	<b>&lt;1</b>	<1	<1
Silver	ppm	ASTM D5185m	>2	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>15	<b>1</b>	<1	2
Lead	ppm	ASTM D5185m	>18	<b>&lt;1</b>	<1	<1
Copper	ppm	ASTM D5185m	>80	<b>6</b>	8	1
Tin	ppm	ASTM D5185m	>14	<b>&lt;1</b>	0	<1
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
Cadmium	ppm	ASTM D5185m		<b>0</b>	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		<b>68</b>	47	50
Barium	ppm	ASTM D5185m		<b>&lt;1</b>	<1	2
Molybdenum	ppm	ASTM D5185m		<b>33</b>	44	39
Manganese	ppm	ASTM D5185m		<b>0</b>	<1	<1
Magnesium	ppm	ASTM D5185m		<b>866</b>	888	853
Calcium	ppm	ASTM D5185m		<b>1475</b>	1724	1714
Phosphorus	ppm	ASTM D5185m		<b>987</b>	1058	1024
Zinc	ppm	ASTM D5185m		<b>1228</b>	1351	1278
Sulfur	ppm	ASTM D5185m		<b>3058</b>	3839	3501

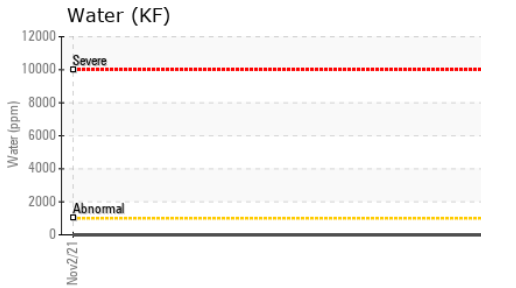
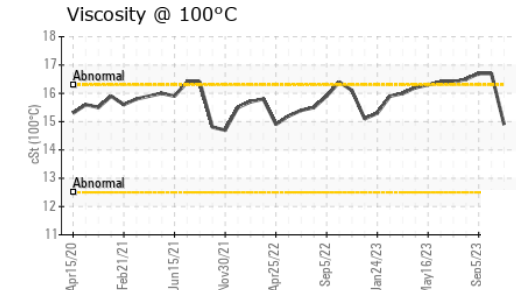
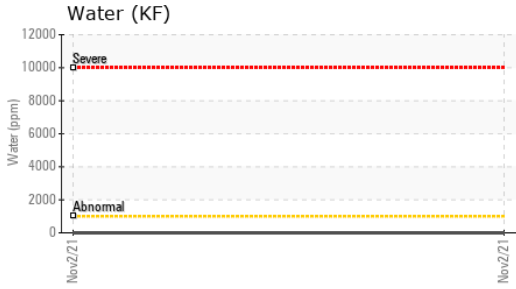
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	<b>4</b>	3	3
Sodium	ppm	ASTM D5185m	>118	<b>&lt;1</b>	2	3
Potassium	ppm	ASTM D5185m	>20	<b>5</b>	5	4
Water	%	ASTM D6304	>0.1	<b>NEG</b>	NEG	NEG

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		<b>0.4</b>	2	1.9
Nitration	Abs/cm	*ASTM D7624	>20	<b>6.2</b>	10.4	10.2
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>19.1</b>	24.2	23.9

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>14.4</b>	18.7	18.5
Base Number (BN)	mg KOH/g	ASTM D2896		<b>11.45</b>	12.61	11.57



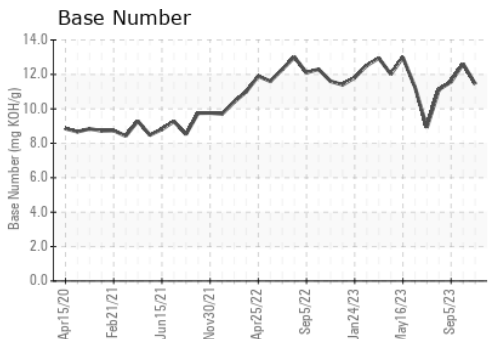
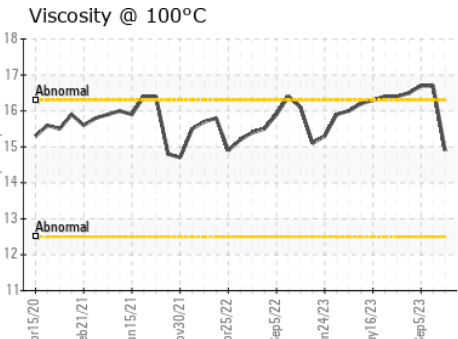
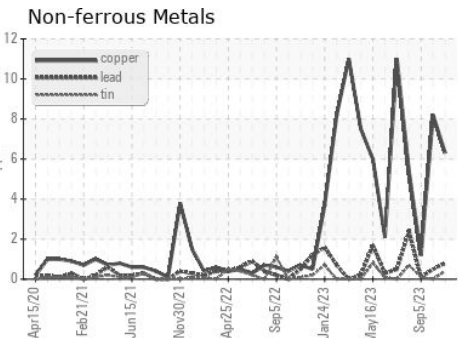
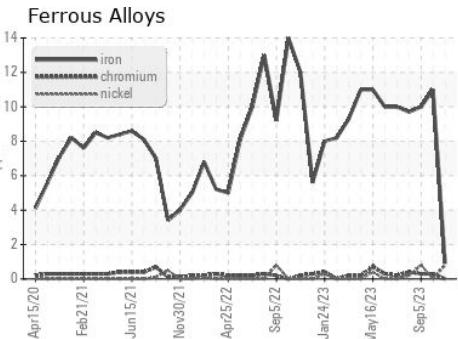
# OIL ANALYSIS REPORT



VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	LIGHT
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
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 PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	<b>14.9</b>	16.7	16.7

## GRAPHS



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC0805236 **Received** : 06 Dec 2023  
**Lab Number** : **06026664** **Diagnosed** : 07 Dec 2023  
**Unique Number** : 10776455 **Diagnostician** : Sean Felton  
**Test Package** : IND 2 ( Additional Tests: KF )

**MARATHON PETROLEUM CO.**  
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 CATLETTSBURG, KY  
 US 41169  
 Contact: CORY GUMBERT  
 cagumbert@marathonpetroleum.com  
 T: (606)585-3950  
 F: x:

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)