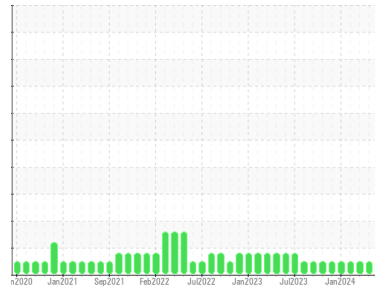




# OIL ANALYSIS REPORT

Sample Rating Trend



**NORMAL**



Area

**Kenova**

Machine Id

**[Kenova] Oil - Starboard Main Engine**

Component

**Starboard Main Engine**

Fluid

**DIESEL ENGINE OIL SAE 15W40 (150 GAL)**

## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: ADAM Fields )

### 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>WC0874915</b>	WC0860077	WC0859748
Sample Date	Client Info		<b>05 Jun 2024</b>	06 May 2024	10 Apr 2024
Machine Age	hrs	Client Info	<b>42002</b>	41386	40857
Oil Age	hrs	Client Info	<b>5705</b>	5088	4562
Oil Changed	Client Info		<b>N/A</b>	Not Changd	N/A
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>36</b>	33	25
Chromium	ppm	ASTM D5185m	>8	<b>&lt;1</b>	<1	<1
Nickel	ppm	ASTM D5185m	>2	<b>&lt;1</b>	<1	0
Titanium	ppm	ASTM D5185m	>3	<b>&lt;1</b>	<1	0
Silver	ppm	ASTM D5185m	>2	<b>0</b>	<1	0
Aluminum	ppm	ASTM D5185m	>15	<b>4</b>	3	3
Lead	ppm	ASTM D5185m	>18	<b>13</b>	13	9
Copper	ppm	ASTM D5185m	>80	<b>68</b>	61	38
Tin	ppm	ASTM D5185m	>14	<b>&lt;1</b>	1	<1
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	<1	0
Cadmium	ppm	ASTM D5185m		<b>&lt;1</b>	<1	0

## ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m	250	<b>73</b>	84	108
Barium	ppm	ASTM D5185m	10	<b>0</b>	<1	0
Molybdenum	ppm	ASTM D5185m	100	<b>99</b>	95	91
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m	450	<b>651</b>	590	633
Calcium	ppm	ASTM D5185m	3000	<b>1734</b>	1713	1686
Phosphorus	ppm	ASTM D5185m	1150	<b>702</b>	689	688
Zinc	ppm	ASTM D5185m	1350	<b>883</b>	845	817
Sulfur	ppm	ASTM D5185m	4250	<b>2762</b>	2688	2954

## CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>20	<b>5</b>	5	6
Sodium	ppm	ASTM D5185m	>158	<b>6</b>	5	5
Potassium	ppm	ASTM D5185m	>20	<b>2</b>	3	<1
Water	%	ASTM D6304	>0.1	<b>NEG</b>	NEG	NEG

## INFRA-RED

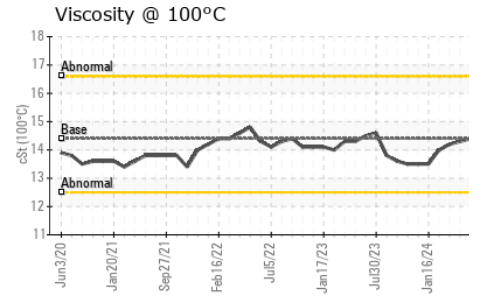
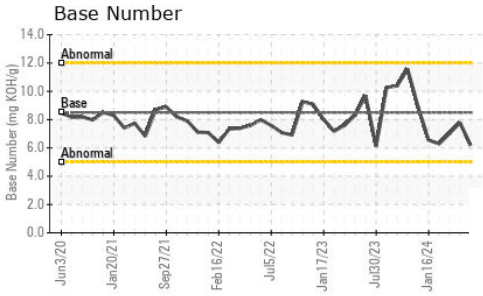
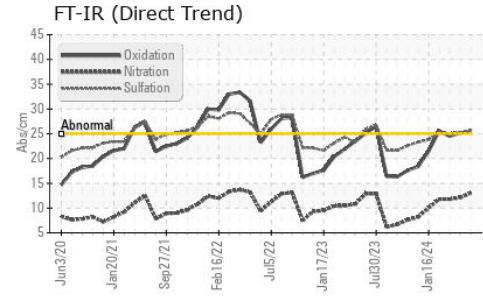
	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844		<b>0.8</b>	0.6	0.6
Nitration	Abs/cm	*ASTM D7624	>20	<b>13.0</b>	12.1	11.8
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>25.7</b>	25.2	25.1

## FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>25.4</b>	25.2	24.5
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	<b>6.18</b>	7.78	7.03



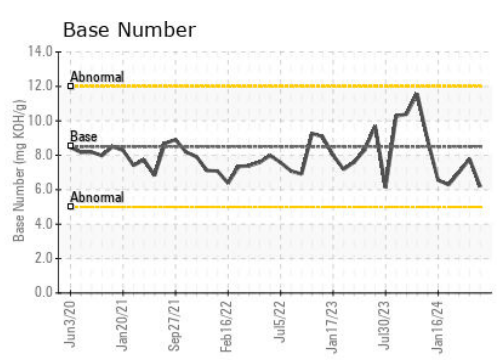
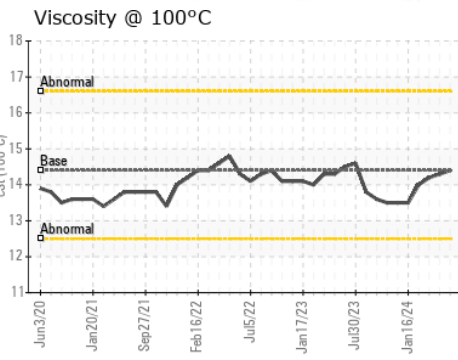
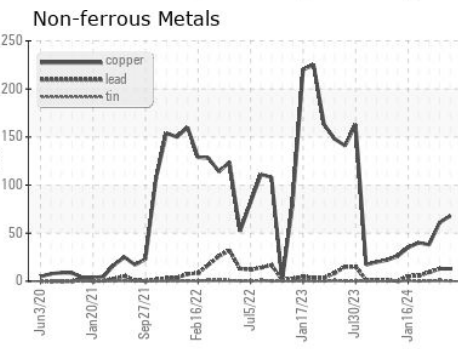
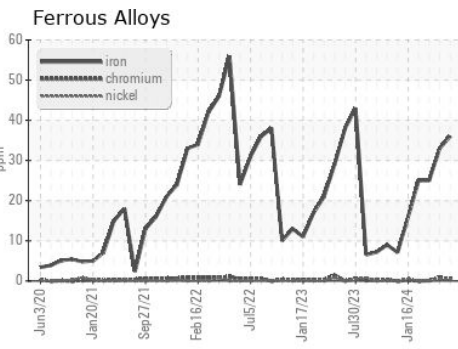
# OIL ANALYSIS REPORT



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
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	14.4	14.3	14.2

### GRAPHS



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC0874915      **Received** : 14 Jun 2024  
**Lab Number** : **06210368**      **Tested** : 18 Jun 2024  
**Unique Number** : 11083232      **Diagnosed** : 18 Jun 2024 - Don Baldrige  
**Test Package** : IND 2 ( Additional Tests: KF )

**MARATHON PETROLEUM CO.**  
 101 12TH ST  
 CATLETTSBURG, KY  
 US 41169  
 Contact: CORY GUMBERT  
 cagumbert@marathonpetroleum.com

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)