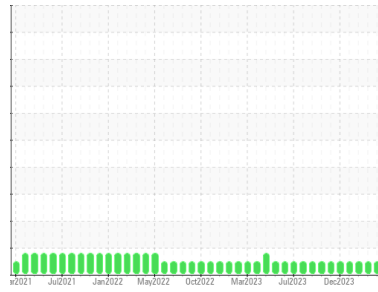




# OIL ANALYSIS REPORT

Sample Rating Trend



**NORMAL**



Area

**Louisville**

Machine Id

**[Louisville] Oil - Port Main Engine**

Component

**Port Main Engine**

Fluid

**DIESEL ENGINE OIL SAE 15W40 (150 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.

## SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	<b>WC0874801</b>	WC0804842	WC0859790
Sample Date	Client Info	<b>28 Apr 2024</b>	30 Jan 2024	29 Dec 2023
Machine Age	hrs	<b>950</b>	39417	0
Oil Age	hrs	<b>950</b>	6631	0
Oil Changed	Client Info	<b>N/A</b>	N/A	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>6</b>	7	4
Chromium	ppm	ASTM D5185m >8	<b>&lt;1</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>&lt;1</b>	0	0
Aluminum	ppm	ASTM D5185m >15	<b>2</b>	<1	2
Lead	ppm	ASTM D5185m >18	<b>1</b>	3	4
Copper	ppm	ASTM D5185m >80	<b>6</b>	24	26
Tin	ppm	ASTM D5185m >14	<b>1</b>	<1	1
Vanadium	ppm	ASTM D5185m	<b>&lt;1</b>	0	<1
Cadmium	ppm	ASTM D5185m	<b>&lt;1</b>	0	<1

## ADDITIVES

method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m 250	<b>20</b>	10	12
Barium	ppm	ASTM D5185m 10	<b>&lt;1</b>	0	0
Molybdenum	ppm	ASTM D5185m 100	<b>61</b>	61	62
Manganese	ppm	ASTM D5185m	<b>&lt;1</b>	<1	2
Magnesium	ppm	ASTM D5185m 450	<b>1396</b>	1477	1374
Calcium	ppm	ASTM D5185m 3000	<b>1186</b>	1165	1060
Phosphorus	ppm	ASTM D5185m 1150	<b>1067</b>	981	933
Zinc	ppm	ASTM D5185m 1350	<b>1238</b>	1283	1197
Sulfur	ppm	ASTM D5185m 4250	<b>3455</b>	2833	2602

## CONTAMINANTS

method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m >20	<b>5</b>	4	4
Sodium	ppm	ASTM D5185m >158	<b>3</b>	2	4
Potassium	ppm	ASTM D5185m >20	<b>2</b>	0	4
Water	%	ASTM D6304 >0.1	<b>NEG</b>	NEG	NEG

## INFRA-RED

method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844	<b>0.1</b>	0.1	0.1
Nitration	Abs/cm	*ASTM D7624 >20	<b>9.0</b>	10.0	9.6
Sulfation	Abs/.1mm	*ASTM D7415 >30	<b>21.1</b>	22.3	21.7

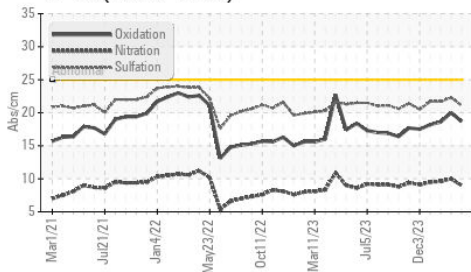
## FLUID DEGRADATION

method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414 >25	<b>18.7</b>	20.0	18.6
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	<b>12.40</b>	9.56	9.74

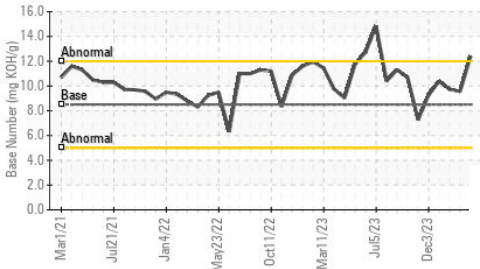


# OIL ANALYSIS REPORT

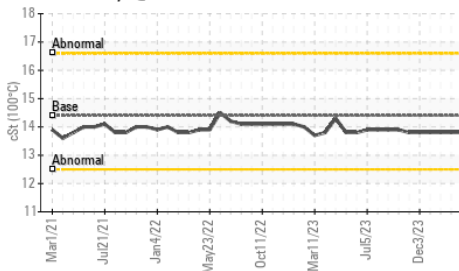
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

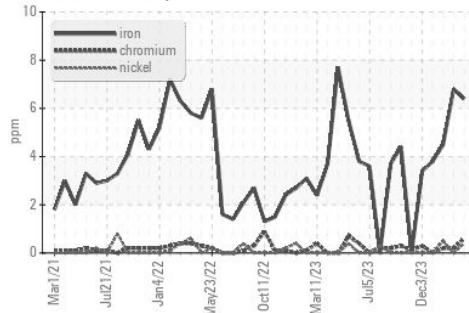


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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

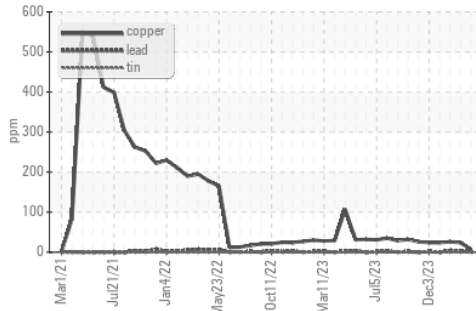
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.8	13.8

## GRAPHS

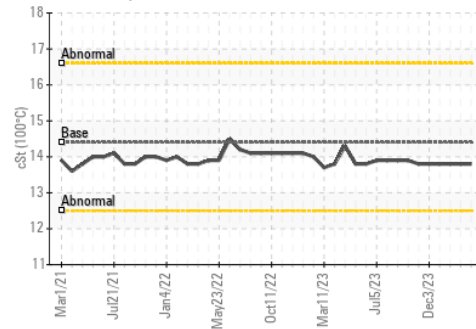
Ferrous Alloys



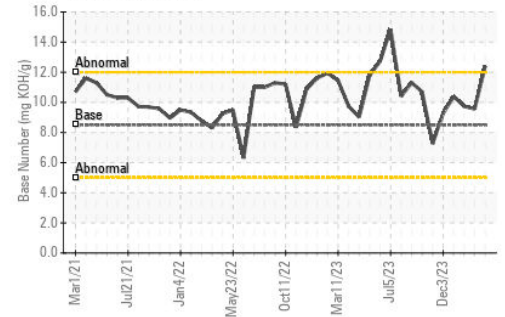
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

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

Sample No. : WC0874801

Lab Number : 06181570

Unique Number : 11032896

Test Package : IND 2 ( Additional Tests: KF )

Received : 16 May 2024

Tested : 20 May 2024

Diagnosed : 20 May 2024 - Sean Felton

MARATHON PETROLEUM CO.

101 12TH ST

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)