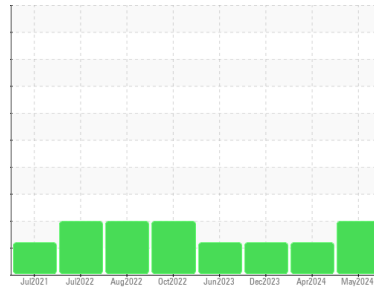




# OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Area

Louisville

Machine Id

[Louisville] Hydraulic - Steering

Component

Hydraulic System

Fluid

AW HYDRAULIC OIL ISO 46 (35 GAL)

## DIAGNOSIS

### Recommendation

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor.

### Wear

The iron level is abnormal. All other component wear rates are normal.

### Contamination

There is a high amount of silt (particulates < 14 microns in size) present in the oil.

### Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

## SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0898529	WC0874757	WC0859758
Sample Date	Client Info		29 May 2024	28 Apr 2024	08 Dec 2023
Machine Age	hrs	Client Info	13589	985	660
Oil Age	hrs	Client Info	13589	13000	12526
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			ABNORMAL	ABNORMAL	ABNORMAL

## WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >20	▲ 24	18	17
Chromium	ppm	ASTM D5185m >20	<1	0	<1
Nickel	ppm	ASTM D5185m >20	0	0	0
Titanium	ppm	ASTM D5185m	<1	<1	<1
Silver	ppm	ASTM D5185m	0	<1	0
Aluminum	ppm	ASTM D5185m >20	2	0	1
Lead	ppm	ASTM D5185m >20	<1	0	0
Copper	ppm	ASTM D5185m >20	2	3	2
Tin	ppm	ASTM D5185m >20	<1	0	0
Vanadium	ppm	ASTM D5185m	0	<1	0
Cadmium	ppm	ASTM D5185m	0	0	0

## ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 5	0	0	0
Barium	ppm	ASTM D5185m 5	<1	2	0
Molybdenum	ppm	ASTM D5185m 5	<1	0	<1
Manganese	ppm	ASTM D5185m	<1	0	0
Magnesium	ppm	ASTM D5185m 25	28	23	32
Calcium	ppm	ASTM D5185m 200	72	67	80
Phosphorus	ppm	ASTM D5185m 300	257	255	269
Zinc	ppm	ASTM D5185m 370	327	306	323
Sulfur	ppm	ASTM D5185m 2500	1065	1184	1192

## CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >15	1	<1	<1
Sodium	ppm	ASTM D5185m	0	3	0
Potassium	ppm	ASTM D5185m >20	1	<1	1
Water	%	ASTM D6304 >0.05	0.002	0.013	0.006
ppm Water	ppm	ASTM D6304 >500	17	139	67

## FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>5000	▲ 133992	▲ 140434	▲ 142805
Particles >6µm	ASTM D7647	>1300	▲ 33912	▲ 42558	▲ 15449
Particles >14µm	ASTM D7647	>160	160	145	32
Particles >21µm	ASTM D7647	>40	19	16	0
Particles >38µm	ASTM D7647	>10	1	0	0
Particles >71µm	ASTM D7647	>3	0	0	0
Oil Cleanliness	ISO 4406 (c)	>19/17/14	▲ 24/22/14	▲ 24/23/14	▲ 24/21/12

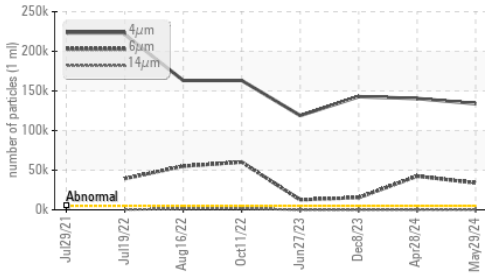
## FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045 0.57	0.28	0.29	0.32

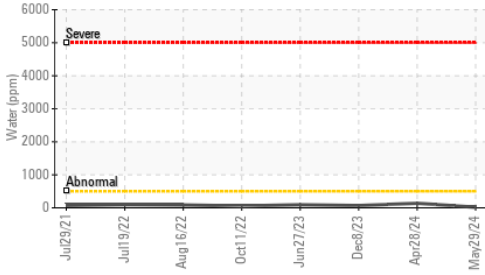


# OIL ANALYSIS REPORT

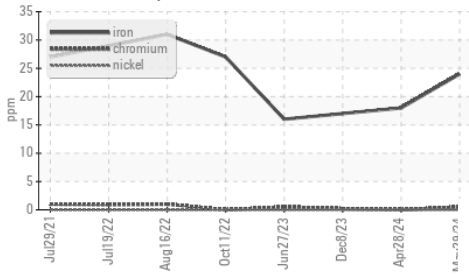
## Particle Trend



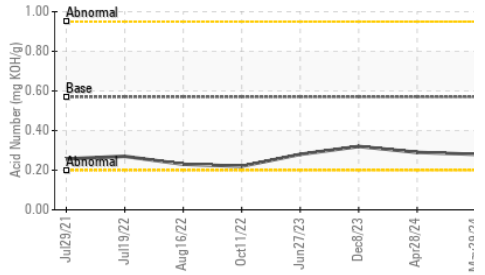
## Water (KF)



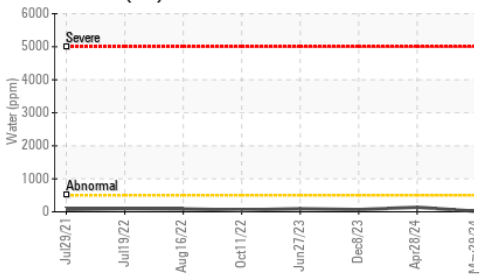
## Ferrous Alloys



## Acid Number



## Water (KF)



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	>0.05	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445 46	51.3	51.0	51.4

SAMPLE IMAGES	method	limit/base	current	history1	history2
---------------	--------	------------	---------	----------	----------

Color

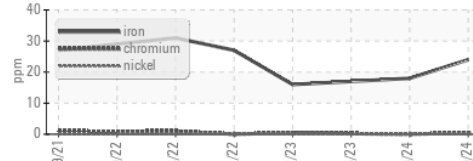


Bottom

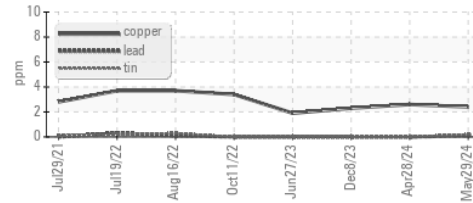


## GRAPHS

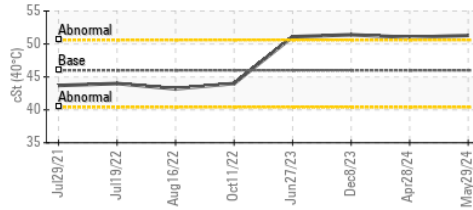
### Ferrous Alloys



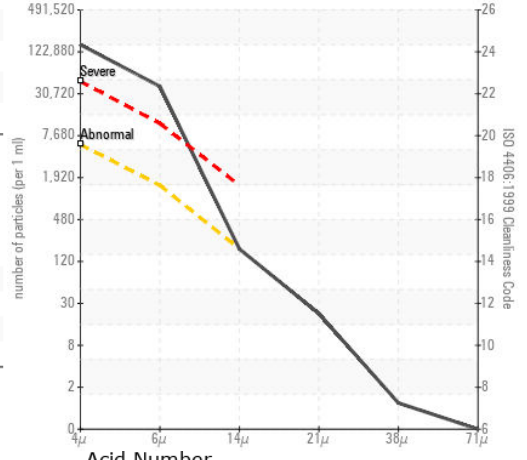
### Non-ferrous Metals



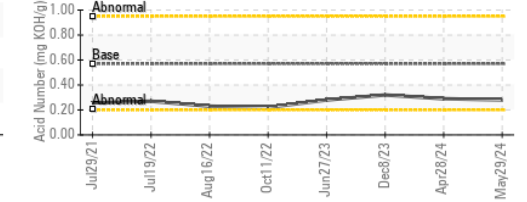
### Viscosity @ 40°C



### Particle Count



### Acid Number



Certificate L2367

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

Sample No. : WC0898529

Lab Number : 06201491

Unique Number : 11063614

Test Package : IND 2 ( Additional Tests: KF )

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)

Received : 06 Jun 2024

Tested : 07 Jun 2024

Diagnosed : 09 Jun 2024 - Don Baldrige

MARATHON PETROLEUM CO.

101 12TH ST

CATLETTSBURG, KY

US 41169

Contact: CORY GUMBERT

cagumbert@marathonpetroleum.com

T: (606)585-3950

F: x: