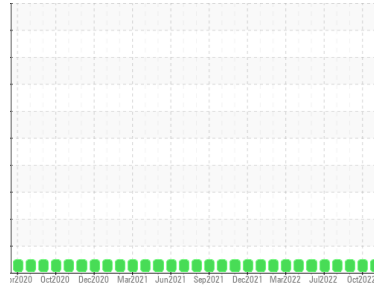




OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Area
Catlettsburg
 Machine Id
[Catlettsburg] Oil - Starboard Reduction Gear
 Component
Starboard Reduction Gear
 Fluid
MARATHON 80W145 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.
 NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

Wear

All component wear rates are normal.

Contamination

The water content is negligible. There is no indication of any contamination 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		WC0769476	WC0731845	WC0683567
Sample Date	Client Info		08 Aug 2023	01 Oct 2022	03 Sep 2022
Machine Age	hrs	Client Info	0	0	51873
Oil Age	hrs	Client Info	0	52454	51873
Oil Changed	Client Info		Not Changed	N/A	Not Changed
Sample Status			NORMAL	NORMAL	NORMAL

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >150	107	62	80
Chromium	ppm	ASTM D5185m >10	<1	<1	<1
Nickel	ppm	ASTM D5185m >10	0	<1	<1
Titanium	ppm	ASTM D5185m	2	<1	1
Silver	ppm	ASTM D5185m	0	0	0
Aluminum	ppm	ASTM D5185m >25	8	3	4
Lead	ppm	ASTM D5185m >100	<1	<1	2
Copper	ppm	ASTM D5185m >50	17	6	8
Tin	ppm	ASTM D5185m >10	0	0	<1
Vanadium	ppm	ASTM D5185m	<1	0	<1
Cadmium	ppm	ASTM D5185m	<1	0	1

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	104	59	84
Barium	ppm	ASTM D5185m	0	0	1
Molybdenum	ppm	ASTM D5185m	0	<1	<1
Manganese	ppm	ASTM D5185m	2	<1	1
Magnesium	ppm	ASTM D5185m	3	11	4
Calcium	ppm	ASTM D5185m	40	63	31
Phosphorus	ppm	ASTM D5185m	909	701	825
Zinc	ppm	ASTM D5185m	23	36	23
Sulfur	ppm	ASTM D5185m	23526	17746	19430

CONTAMINANTS

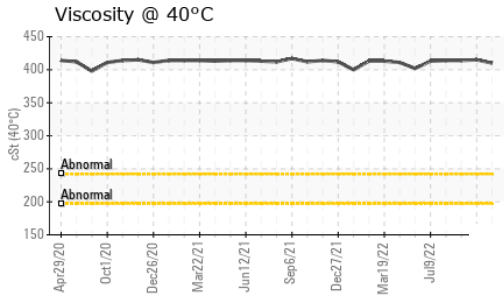
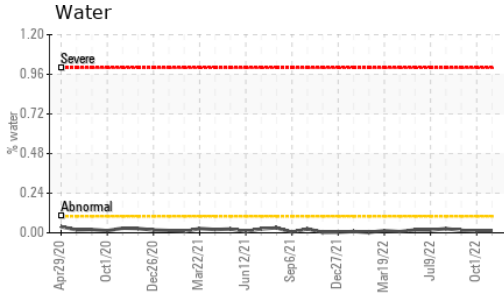
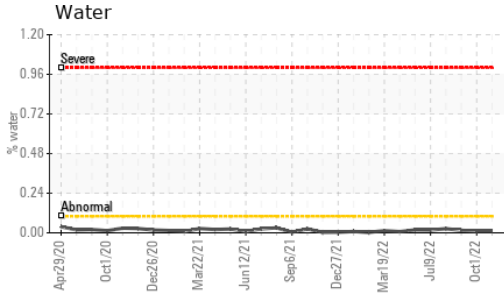
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >50	15	7	9
Sodium	ppm	ASTM D5185m	17	10	12
Potassium	ppm	ASTM D5185m >20	43	28	35
Water	%	ASTM D6304 >0.1	0.011	0.011	0.015
ppm Water	ppm	ASTM D6304 >1000	112.0	115.0	151.9

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	2.21	2.38	2.64



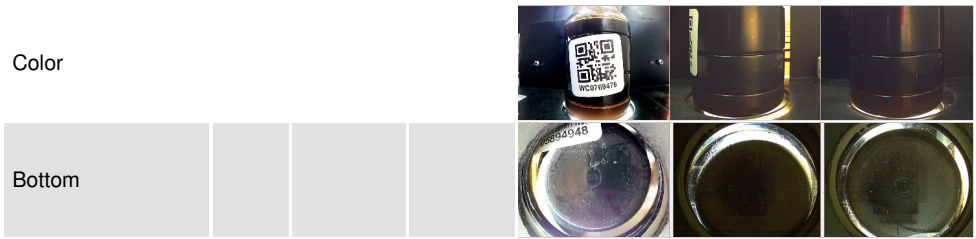
OIL ANALYSIS REPORT



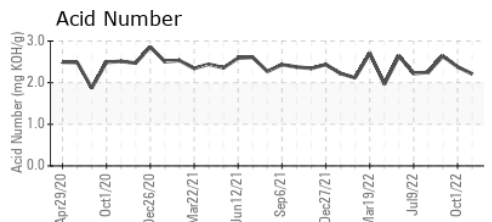
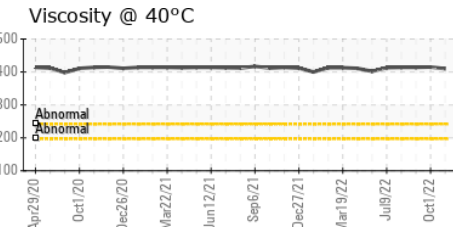
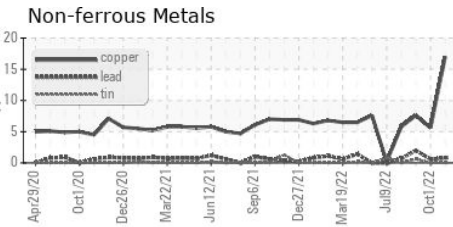
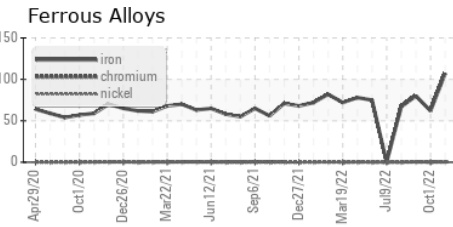
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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 @ 40°C	cSt	ASTM D445	410	415	414

SAMPLE IMAGES	method	limit/base	current	history1	history2
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GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0769476 **Received** : 23 Aug 2023
Lab Number : 05932145 **Diagnosed** : 24 Aug 2023
Unique Number : 10617416 **Diagnostician** : Wes Davis
Test Package : IND 2 (Additional Tests: KF)

MARATHON PETROLEUM CO.
 101 12TH ST
 CATLETTSBURG, KY
 US 41169
 Contact: M/V CATLETTSBURG
 mvcburg@marathonpetroleum.com

Certificate L2367
 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)