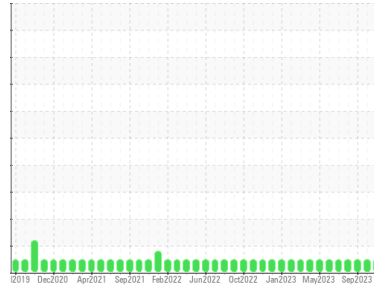




OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Area
Detroit
 Machine Id
[Detroit] Oil - Starboard Main Engine
 Component
Starboard Main Engine
 Fluid
MOBIL 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		WC0804902	WC0769344	WC0769339
Sample Date	Client Info		06 Nov 2023	09 Oct 2023	11 Sep 2023
Machine Age	hrs	Client Info	16438	15851	15324
Oil Age	hrs	Client Info	742	15851	15324
Oil Changed	Client Info		N/A	Not Changd	N/A
Sample Status			NORMAL	NORMAL	NORMAL

CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>4.0	<1.0	<1.0	<1.0
Glycol	WC Method		NEG	NEG	NEG

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >75	58	62	63
Chromium	ppm	ASTM D5185m >8	<1	1	<1
Nickel	ppm	ASTM D5185m >2	2	4	3
Titanium	ppm	ASTM D5185m >3	0	0	<1
Silver	ppm	ASTM D5185m >2	0	0	0
Aluminum	ppm	ASTM D5185m >15	2	<1	<1
Lead	ppm	ASTM D5185m >18	8	9	10
Copper	ppm	ASTM D5185m >80	31	33	32
Tin	ppm	ASTM D5185m >14	2	2	2
Vanadium	ppm	ASTM D5185m	0	0	0
Cadmium	ppm	ASTM D5185m	0	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	43	45	55
Barium	ppm	ASTM D5185m	0	0	0
Molybdenum	ppm	ASTM D5185m	48	54	55
Manganese	ppm	ASTM D5185m	1	1	1
Magnesium	ppm	ASTM D5185m	865	844	1005
Calcium	ppm	ASTM D5185m	1565	1605	1758
Phosphorus	ppm	ASTM D5185m	860	931	996
Zinc	ppm	ASTM D5185m	1148	1205	1329
Sulfur	ppm	ASTM D5185m	2652	3256	3041

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >20	3	4	4
Sodium	ppm	ASTM D5185m >118	5	4	5
Potassium	ppm	ASTM D5185m >20	1	4	3

INFRA-RED

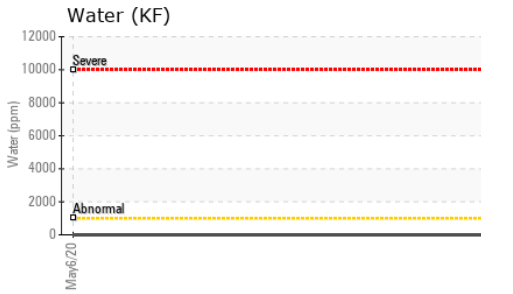
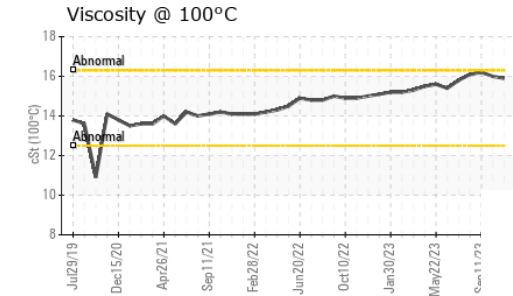
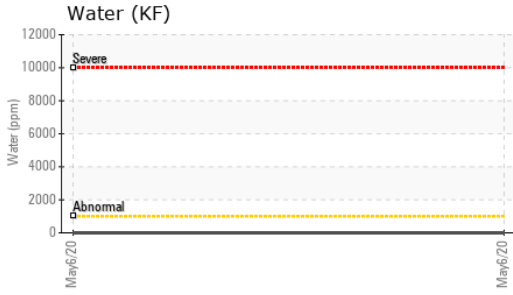
	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	0.5	0.5	0.5
Nitration	Abs/cm	*ASTM D7624 >20	14.3	13.5	14.4
Sulfation	Abs/.1mm	*ASTM D7415 >30	28.4	27.0	28.0

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	31.9	29.8	31.1
Base Number (BN)	mg KOH/g	ASTM D2896	8.15	7.63	8.11



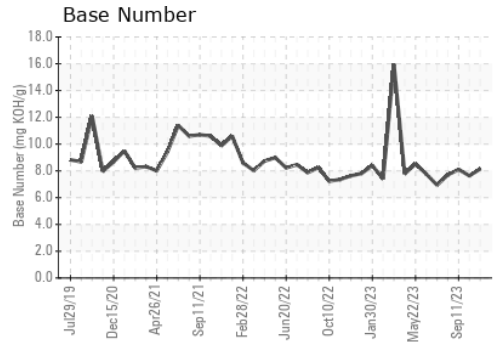
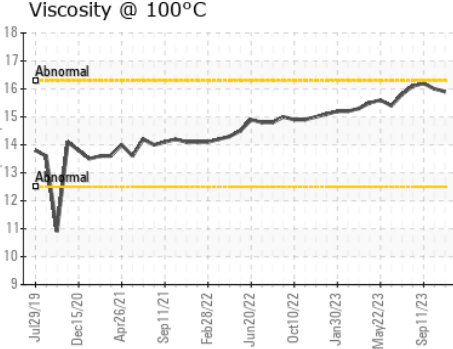
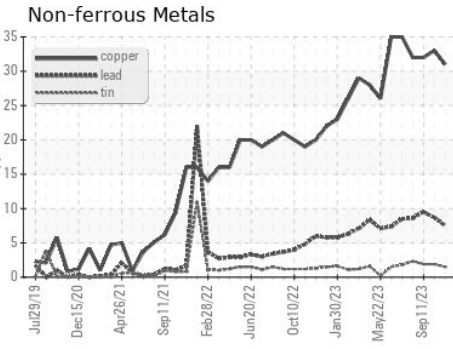
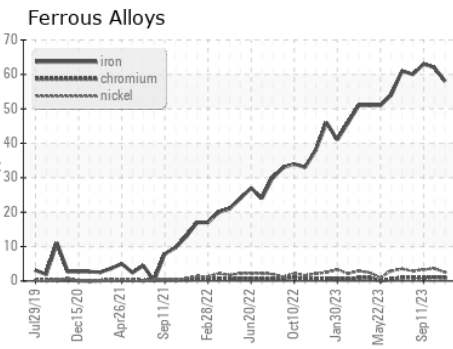
OIL ANALYSIS REPORT



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	15.9	16.0	16.2

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
 Sample No. : WC0804902
 Lab Number : 06008537
 Unique Number : 10742299
 Test Package : IND 2 (Additional Tests: KF)

Received : 15 Nov 2023
 Diagnosed : 17 Nov 2023
 Diagnostician : Sean Felton

MARATHON PETROLEUM CO.
 101 12TH ST
 CATLETTSBURG, KY
 US 41169

Contact: SHAWN MCCLASKEY
 stmccclaskey@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)

T: (606)739-2416

F: x: