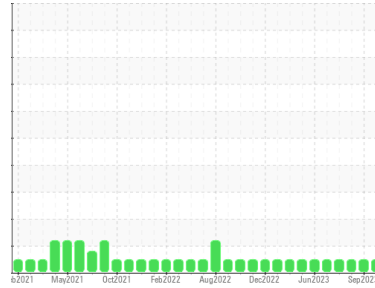




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area
Tri State
 Machine Id
[Tri State] Oil - Port Main Engine
 Component
Port Main Engine
 Fluid
DIESEL ENGINE OIL SAE 15W40 (37 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	WC0846095	WC0805272	WC0805268
Sample Date	Client Info	30 Oct 2023	26 Sep 2023	30 Aug 2023
Machine Age	hrs	19499	18920	18409
Oil Age	hrs	1813	1235	723
Oil Changed	Client Info	Changed	Not Changd	Oil Added
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	9	5	3
Chromium	ppm ASTM D5185m >8	1	<1	<1
Nickel	ppm ASTM D5185m >2	2	2	<1
Titanium	ppm ASTM D5185m >3	<1	<1	<1
Silver	ppm ASTM D5185m >2	0	0	0
Aluminum	ppm ASTM D5185m >15	3	<1	<1
Lead	ppm ASTM D5185m >18	2	1	<1
Copper	ppm ASTM D5185m >80	2	<1	1
Tin	ppm ASTM D5185m >14	<1	<1	<1
Vanadium	ppm ASTM D5185m	<1	0	<1
Cadmium	ppm ASTM D5185m	<1	0	0

ADDITIVES

method	limit/base	current	history1	history2
Boron	ppm ASTM D5185m 250	22	26	31
Barium	ppm ASTM D5185m 10	<1	0	0
Molybdenum	ppm ASTM D5185m 100	68	64	62
Manganese	ppm ASTM D5185m	0	<1	<1
Magnesium	ppm ASTM D5185m 450	1550	1603	1523
Calcium	ppm ASTM D5185m 3000	1096	1141	1109
Phosphorus	ppm ASTM D5185m 1150	983	1001	953
Zinc	ppm ASTM D5185m 1350	1213	1279	1168
Sulfur	ppm ASTM D5185m 4250	3923	3585	3934

CONTAMINANTS

method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185m >20	2	2	2
Sodium	ppm ASTM D5185m >158	4	1	2
Potassium	ppm ASTM D5185m >20	2	1	0

INFRA-RED

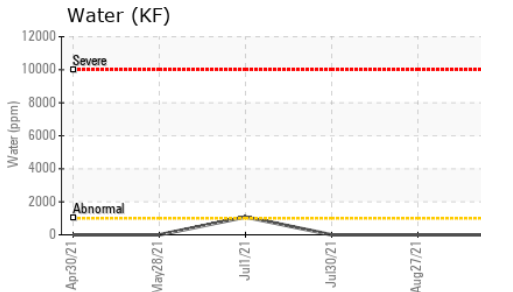
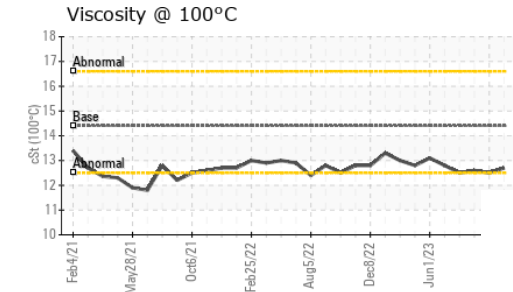
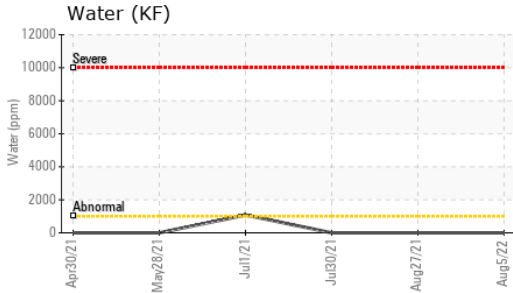
method	limit/base	current	history1	history2
Soot %	% *ASTM D7844	0.1	0.1	0.1
Nitration	Abs/cm *ASTM D7624 >20	11.9	10.5	8.9
Sulfation	Abs/.1mm *ASTM D7415 >30	21.5	20.1	19.0

FLUID DEGRADATION

method	limit/base	current	history1	history2
Oxidation	Abs/.1mm *ASTM D7414 >25	20.1	17.5	14.9
Base Number (BN)	mg KOH/g ASTM D2896 8.5	13.65	12.16	12.50



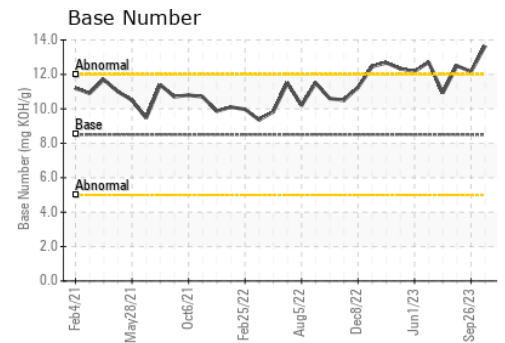
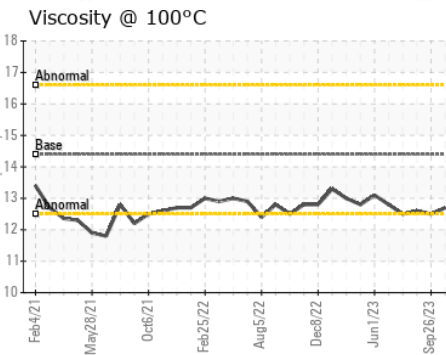
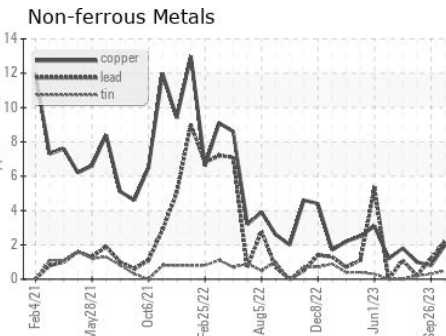
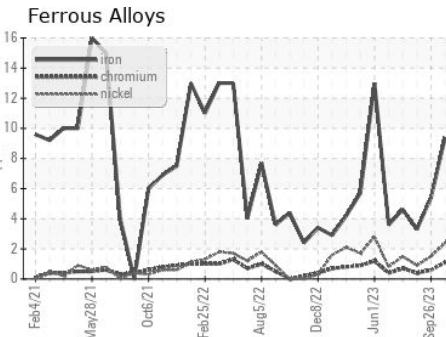
OIL ANALYSIS REPORT



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	12.7	12.5	12.6

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
 Sample No. : WC0846095
 Lab Number : 05995903
 Unique Number : 10724263
 Test Package : IND 2 (Additional Tests: KF)

Received : 01 Nov 2023
 Diagnosed : 02 Nov 2023
 Diagnostician : 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)