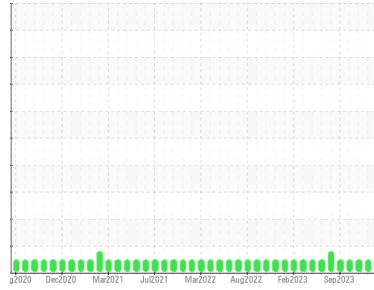




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area
Marathon
 Machine Id
[Marathon] 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. (Customer Sample Comment: Chris Comuzie)

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			WC0846110	WC0846103	WC0846105
Sample Date	Client Info			01 Apr 2024	12 Feb 2024	13 Dec 2023
Machine Age	hrs Client Info			6795	6029	4902
Oil Age	hrs Client Info			6795	6029	4902
Oil Changed	Client Info			Filtered	Filtered	Filtered
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	21	19	18
Chromium	ppm	ASTM D5185m	>8	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>3	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	3	2	2
Lead	ppm	ASTM D5185m	>18	5	4	3
Copper	ppm	ASTM D5185m	>80	7	6	8
Tin	ppm	ASTM D5185m	>14	2	1	<1
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	250	112	120	126
Barium	ppm	ASTM D5185m	10	1	0	6
Molybdenum	ppm	ASTM D5185m	100	90	88	81
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m	450	647	660	641
Calcium	ppm	ASTM D5185m	3000	1662	1676	1607
Phosphorus	ppm	ASTM D5185m	1150	817	830	877
Zinc	ppm	ASTM D5185m	1350	1033	1045	1053
Sulfur	ppm	ASTM D5185m	4250	2958	2693	2888

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

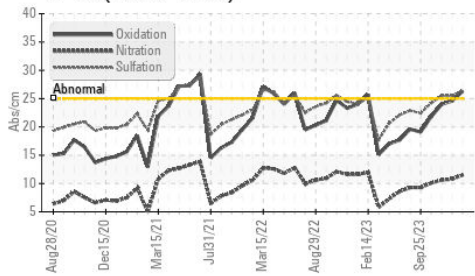
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		0.3	0.2	0.2
Nitration	Abs/cm	*ASTM D7624	>20	11.5	10.8	10.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	26.3	25.5	25.5

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	26.3	24.6	24.0
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	6.36	7.42	6.92

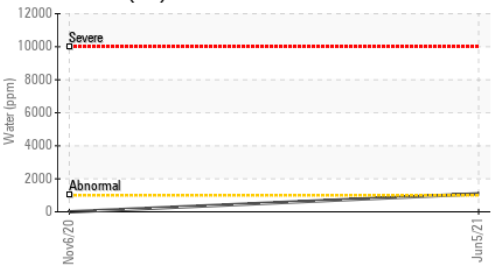


OIL ANALYSIS REPORT

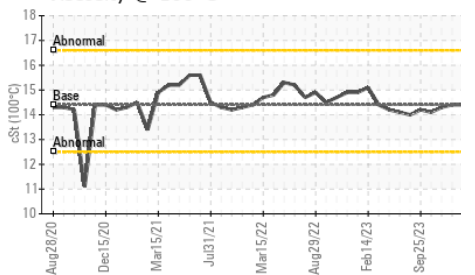
FT-IR (Direct Trend)



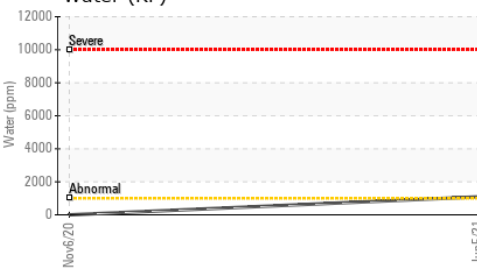
Water (KF)



Viscosity @ 100°C



Water (KF)

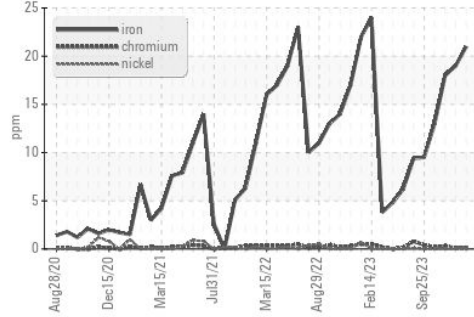


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

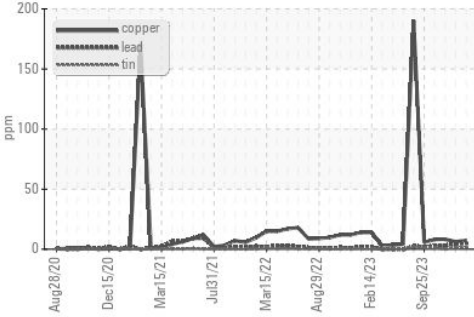
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	14.4	14.3

GRAPHS

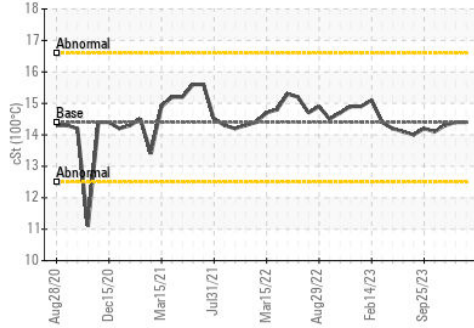
Ferrous Alloys



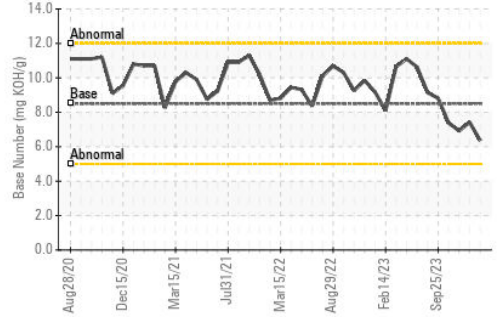
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0846110 **Received** : 23 Apr 2024
Lab Number : **06157872** **Tested** : 25 Apr 2024
Unique Number : 10993295 **Diagnosed** : 25 Apr 2024 - Sean Felton
Test Package : IND 2 (Additional Tests: KF)

MARATHON PETROLEUM CO.
 101 12TH ST
 CATLETTSBURG, KY
 US 41169
 Contact: CORY GUMBERT
 cagumbert@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)585-3950

F: x: