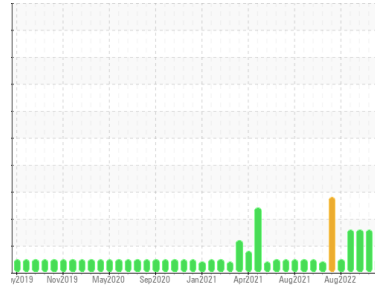




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area
Marathon
 Machine Id
[Marathon] Oil - Starboard Genset
 Component
Starboard Genset
 Fluid
DIESEL ENGINE OIL SAE 15W40 (35 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.
 Please specify the brand, type, and viscosity of the oil on your next sample.

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		WC0769285	WC0735258	WC0735298
Sample Date	Client Info		25 Sep 2023	09 Apr 2023	14 Feb 2023
Machine Age	hrs	Client Info	5349	3286	2813
Oil Age	hrs	Client Info	5349	3286	2813
Oil Changed	Client Info		N/A	Oil Added	N/A
Sample Status			NORMAL	ABNORMAL	ABNORMAL

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 >50	46	▲ 49	▲ 54
Chromium	ppm	ASTM D5185m >4	<1	<1	<1
Nickel	ppm	ASTM D5185m >2	0	0	0
Titanium	ppm	ASTM D5185m	2	0	<1
Silver	ppm	ASTM D5185m >5	0	0	0
Aluminum	ppm	ASTM D5185m >12	2	0	<1
Lead	ppm	ASTM D5185m >17	2	1	2
Copper	ppm	ASTM D5185m >70	21	▲ 92	▲ 119
Tin	ppm	ASTM D5185m >15	1	1	1
Vanadium	ppm	ASTM D5185m	<1	0	0
Cadmium	ppm	ASTM D5185m	0	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 250	145	58	54
Barium	ppm	ASTM D5185m 10	0	0	0
Molybdenum	ppm	ASTM D5185m 100	108	35	37
Manganese	ppm	ASTM D5185m	1	<1	<1
Magnesium	ppm	ASTM D5185m 450	763	753	749
Calcium	ppm	ASTM D5185m 3000	1685	1834	1735
Phosphorus	ppm	ASTM D5185m 1150	759	1069	1000
Zinc	ppm	ASTM D5185m 1350	1003	1349	1286
Sulfur	ppm	ASTM D5185m 4250	2500	2670	2594

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	6	7	6
Sodium	ppm	ASTM D5185m >158	5	5	7
Potassium	ppm	ASTM D5185m >20	1	6	5

INFRA-RED

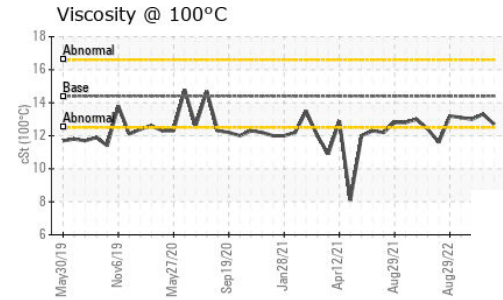
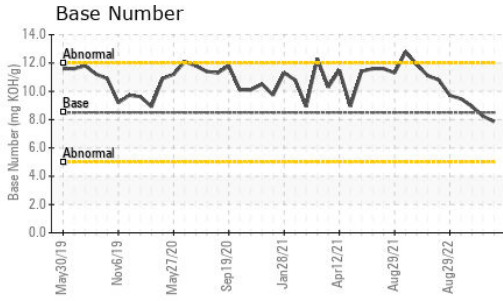
	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	0.3	0.3	0.3
Nitration	Abs/cm	*ASTM D7624 >20	11.1	9.6	11.5
Sulfation	Abs/.1mm	*ASTM D7415 >30	24.2	20.4	21.4

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	23.1	20.4	20.6
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	7.87	8.24	8.93



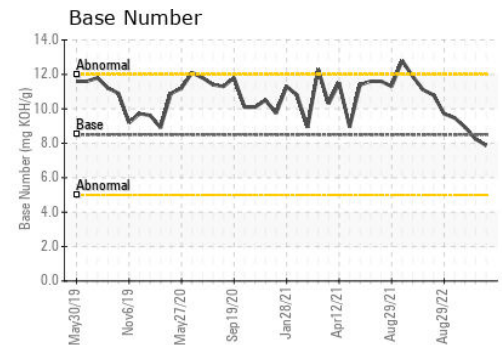
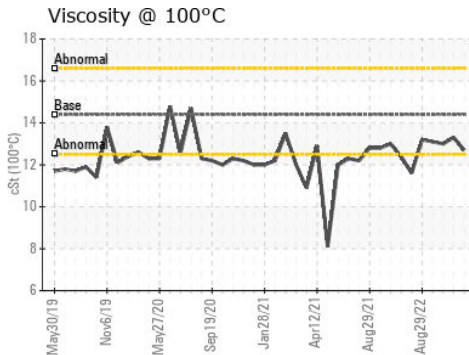
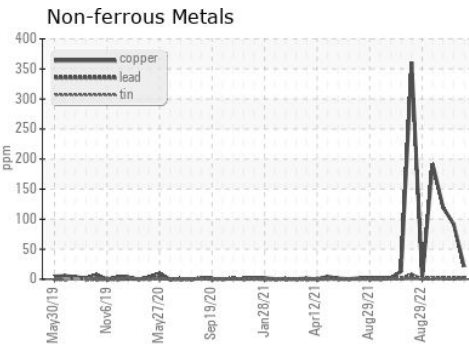
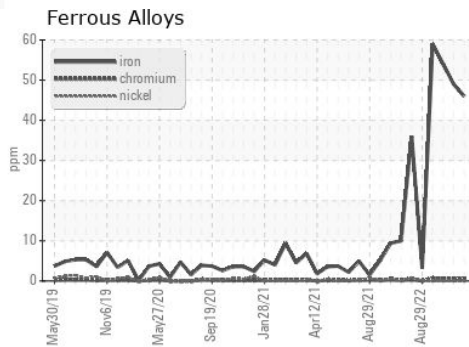
OIL ANALYSIS REPORT



VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	LIGHT
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	13.3	13.0

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0769285 **Received** : 03 Oct 2023
Lab Number : **05967937** **Diagnosed** : 04 Oct 2023
Unique Number : 10674488 **Diagnostician** : Wes Davis
Test Package : IND 2

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 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)