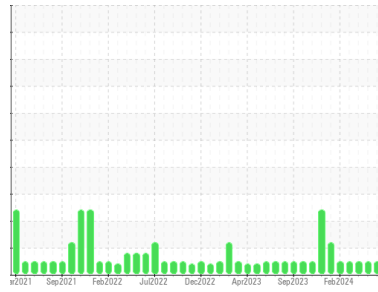




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area

Detroit

Machine Id

[Detroit] Oil - Starboard Genset

Component

Starboard Genset

Fluid

MOBIL 15W40 (7 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 acceptable for the time in service.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0859864	WC0804766	WC0804787
Sample Date	Client Info		03 Jun 2024	20 May 2024	22 Apr 2024
Machine Age	hrs	Client Info	9880	9760	9453
Oil Age	hrs	Client Info	2	306	0
Oil Changed	Client Info		Diff Oil	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 >50	3	11	4
Chromium	ppm	ASTM D5185m >4	0	<1	<1
Nickel	ppm	ASTM D5185m >2	1	0	0
Titanium	ppm	ASTM D5185m	0	0	<1
Silver	ppm	ASTM D5185m >5	<1	0	<1
Aluminum	ppm	ASTM D5185m >12	3	2	5
Lead	ppm	ASTM D5185m >17	0	<1	2
Copper	ppm	ASTM D5185m >70	1	<1	<1
Tin	ppm	ASTM D5185m >15	0	0	1
Vanadium	ppm	ASTM D5185m	0	<1	<1
Cadmium	ppm	ASTM D5185m	0	0	<1

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	71	88	96
Barium	ppm	ASTM D5185m	0	0	0
Molybdenum	ppm	ASTM D5185m	26	23	24
Manganese	ppm	ASTM D5185m	<1	<1	0
Magnesium	ppm	ASTM D5185m	346	266	293
Calcium	ppm	ASTM D5185m	2240	2384	2427
Phosphorus	ppm	ASTM D5185m	585	451	533
Zinc	ppm	ASTM D5185m	696	561	570
Sulfur	ppm	ASTM D5185m	4554	4534	4486

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	9	2	13
Sodium	ppm	ASTM D5185m >118	3	2	<1
Potassium	ppm	ASTM D5185m >20	2	<1	4
Water	%	ASTM D6304 >0.1	NEG	NEG	NEG

INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	0.1	0.3	0.1
Nitration	Abs/cm	*ASTM D7624 >20	7.3	9.3	6.6
Sulfation	Abs/.1mm	*ASTM D7415 >30	19.6	20.7	19.9

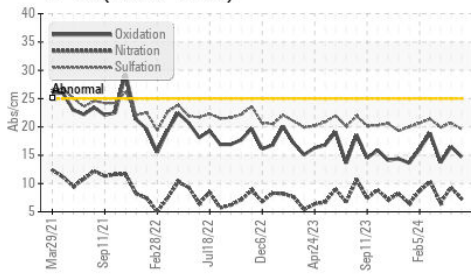
FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	14.7	16.5	13.7
Base Number (BN)	mg KOH/g	ASTM D2896	9.84	9.55	10.13

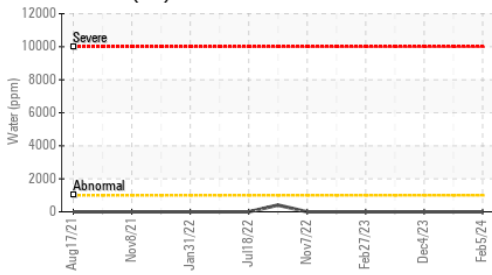


OIL ANALYSIS REPORT

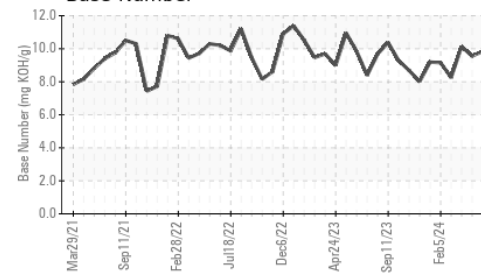
FT-IR (Direct Trend)



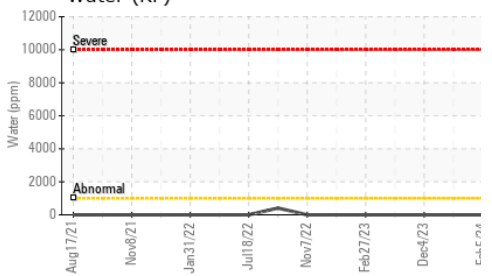
Water (KF)



Base Number



Water (KF)

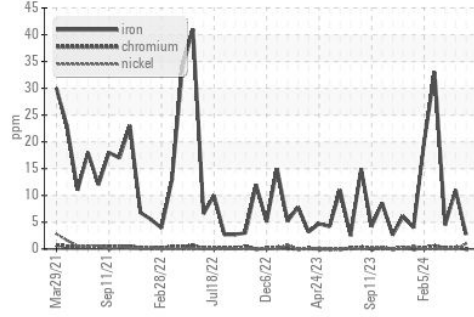


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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

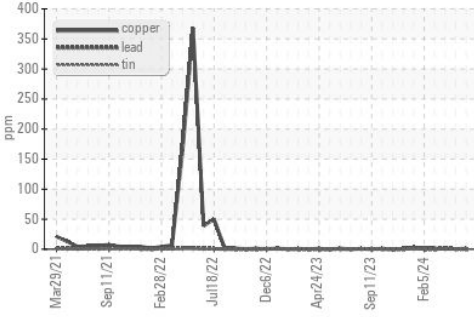
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.3	13.6	14.2

GRAPHS

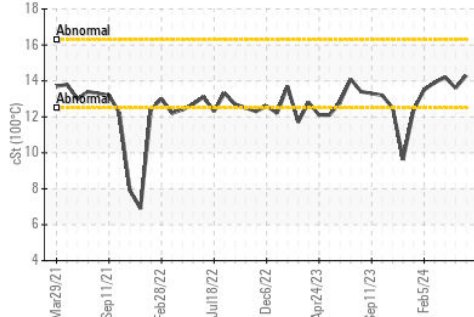
Ferrous Alloys



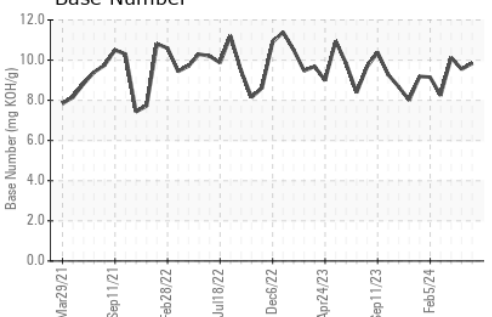
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0859864
Lab Number : 06219920
Unique Number : 11098117
Test Package : IND 2 (Additional Tests: KF)
Received : 25 Jun 2024
Tested : 26 Jun 2024
Diagnosed : 26 Jun 2024 - 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)