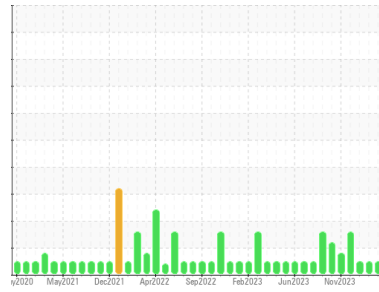




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area

Louisville

Machine Id

[Louisville] Oil - Starboard Genset

Component

Starboard Genset

Fluid

MOBIL 15W40 (35 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	WC0874754	WC0874805	WC0859851	
Sample Date	Client Info	28 Apr 2024	13 Mar 2024	30 Jan 2024	
Machine Age	hrs	Client Info	12436	11979	12931
Oil Age	hrs	Client Info	9731	6275	810
Oil Changed	Client Info	N/A	N/A	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	14	18	13
Chromium	ppm	ASTM D5185m >4	1	<1	<1
Nickel	ppm	ASTM D5185m >2	<1	0	0
Titanium	ppm	ASTM D5185m	<1	0	<1
Silver	ppm	ASTM D5185m >5	<1	0	0
Aluminum	ppm	ASTM D5185m >12	2	1	<1
Lead	ppm	ASTM D5185m >17	1	<1	2
Copper	ppm	ASTM D5185m >70	2	2	3
Tin	ppm	ASTM D5185m >15	<1	0	0
Vanadium	ppm	ASTM D5185m	<1	0	0
Cadmium	ppm	ASTM D5185m	<1	0	0

ADDITIVES

method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m	10	12	22
Barium	ppm	ASTM D5185m	<1	0	0
Molybdenum	ppm	ASTM D5185m	58	60	59
Manganese	ppm	ASTM D5185m	<1	0	<1
Magnesium	ppm	ASTM D5185m	1369	1419	1461
Calcium	ppm	ASTM D5185m	1119	1131	1137
Phosphorus	ppm	ASTM D5185m	1022	1067	1038
Zinc	ppm	ASTM D5185m	1224	1234	1252
Sulfur	ppm	ASTM D5185m	3250	3327	3276

CONTAMINANTS

method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m >25	17	3	3
Sodium	ppm	ASTM D5185m >118	3	2	2
Potassium	ppm	ASTM D5185m >20	2	2	0
Water	%	ASTM D6304 >0.1	NEG	NEG	NEG

INFRA-RED

method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844	0.2	0.2	0.3
Nitration	Abs/cm	*ASTM D7624 >20	9.7	10.5	10.4
Sulfation	Abs/.1mm	*ASTM D7415 >30	19.7	20.2	19.9

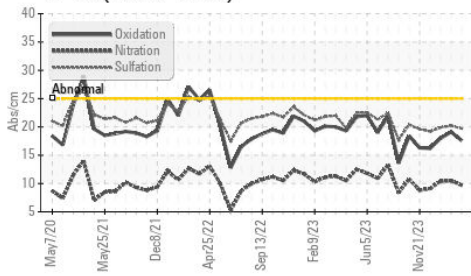
FLUID DEGRADATION

method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414 >25	17.6	19.1	18.0
Base Number (BN)	mg KOH/g	ASTM D2896	11.51	12.51	11.45

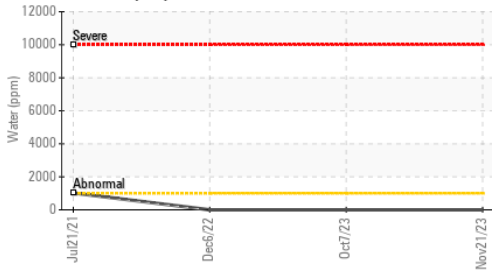


OIL ANALYSIS REPORT

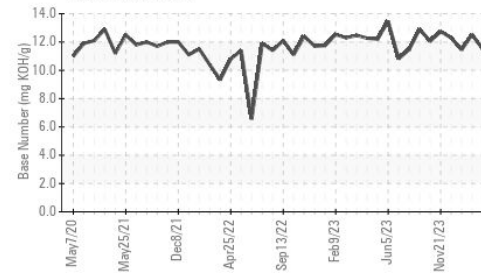
FT-IR (Direct Trend)



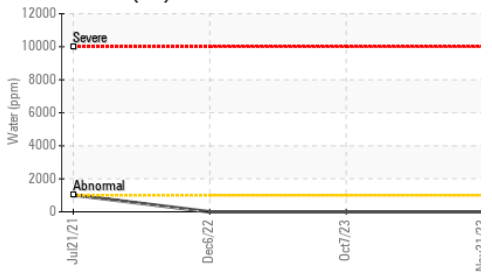
Water (KF)



Base Number



Water (KF)

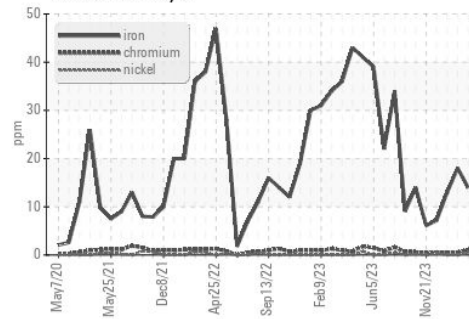


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance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

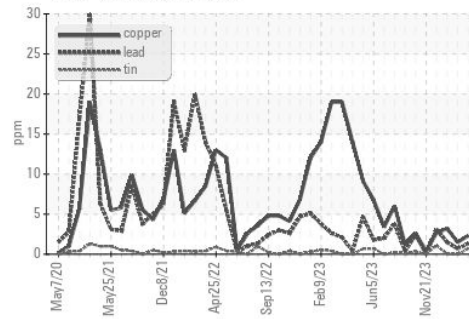
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	12.8	12.3	12.5

GRAPHS

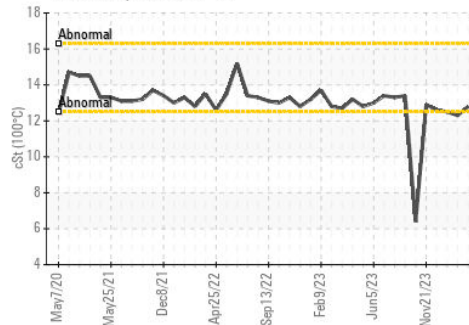
Ferrous Alloys



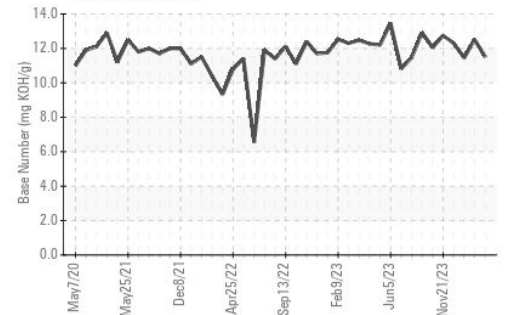
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : WC0874754

Lab Number : 06181568

Unique Number : 11032894

Test Package : IND 2 (Additional Tests: KF)

Received : 16 May 2024

Tested : 20 May 2024

Diagnosed : 20 May 2024 - 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)