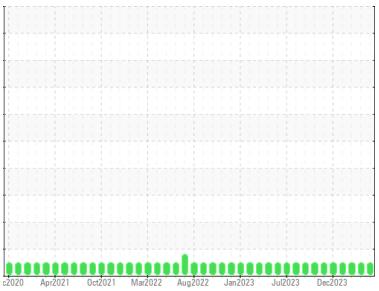
OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Area
Paul G. Blazer
Machine Id
[Paul G. Blazer] Oil - Starboard Genset
Component
Starboard Genset
Fluid
DIESEL ENGINE OIL SAE 15W40 (8 GAL)

DIAGNOSIS

Recommendation
Resample at the next service interval to monitor. (Customer Sample Comment: Kirk James)

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		**WC0845828**	WC0719257	WC0845920
Sample Date		Client Info		**14 Apr 2024**	20 Mar 2024	10 Feb 2024
Machine Age	hrs	Client Info		**13614**	13342	12834
Oil Age	hrs	Client Info		**271**	1	500
Oil Changed		Client Info		**Not Changd**	N/A	Changed
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	**4**	2	10
Chromium	ppm	ASTM D5185m	>4	**<1**	0	<1
Nickel	ppm	ASTM D5185m	>2	**0**	<1	0
Titanium	ppm	ASTM D5185m		**0**	0	<1
Silver	ppm	ASTM D5185m	>5	**0**	0	0
Aluminum	ppm	ASTM D5185m	>12	**2**	2	1
Lead	ppm	ASTM D5185m	>17	**0**	0	<1
Copper	ppm	ASTM D5185m	>70	**0**	<1	2
Tin	ppm	ASTM D5185m	>15	**<1**	0	0
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	**38**	43	40
Barium	ppm	ASTM D5185m	10	**0**	0	0
Molybdenum	ppm	ASTM D5185m	100	**66**	58	65
Manganese	ppm	ASTM D5185m		**<1**	<1	<1
Magnesium	ppm	ASTM D5185m	450	**1426**	1317	1438
Calcium	ppm	ASTM D5185m	3000	**1254**	1119	1293
Phosphorus	ppm	ASTM D5185m	1150	**1005**	927	1003
Zinc	ppm	ASTM D5185m	1350	**1200**	1102	1234
Sulfur	ppm	ASTM D5185m	4250	**3539**	3639	3180

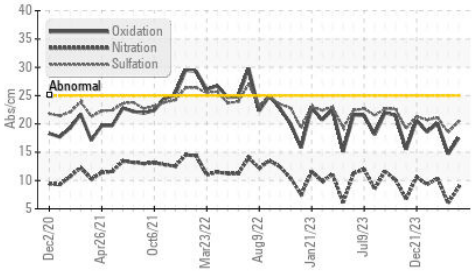
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	**3**	5	3
Sodium	ppm	ASTM D5185m	>158	**2**	1	2
Potassium	ppm	ASTM D5185m	>20	**1**	2	0
Water	%	ASTM D6304	>0.1	**NEG**	NEG	NEG

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0.1**	0.1	0.2
Nitration	Abs/cm	*ASTM D7624	>20	**8.8**	6.0	10.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	**20.4**	18.5	21.1

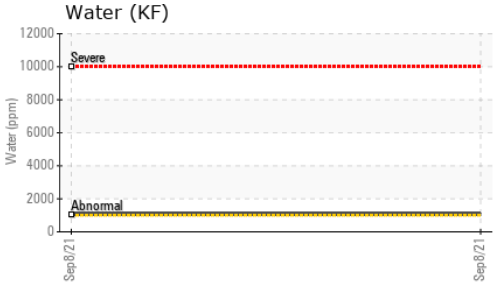
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**17.5**	14.7	20.1
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	**12.79**	11.49	12.29

OIL ANALYSIS REPORT

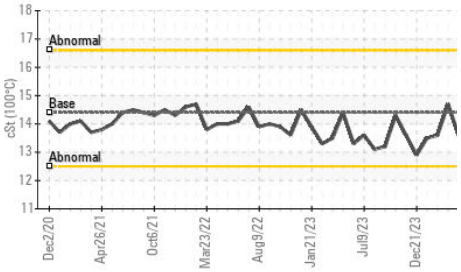
FT-IR (Direct Trend)



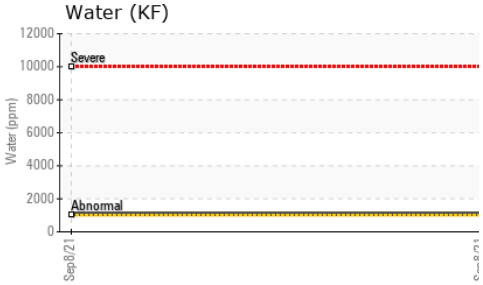
Water (KF)



Viscosity @ 100°C



Water (KF)

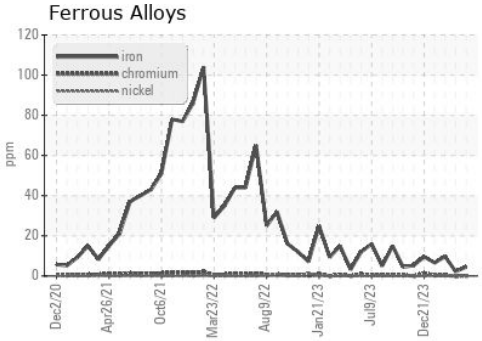


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

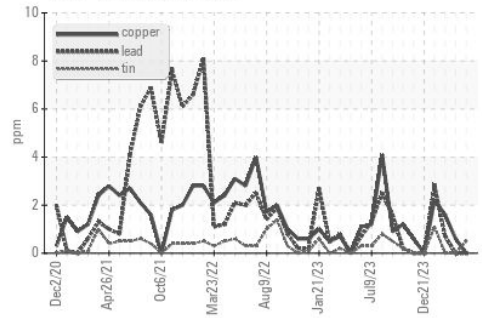
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	**13.6**	14.7	13.6

GRAPHS

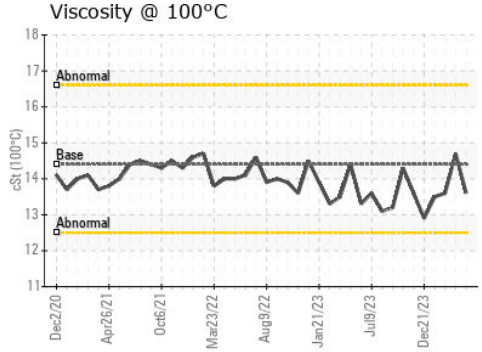
Ferrous Alloys



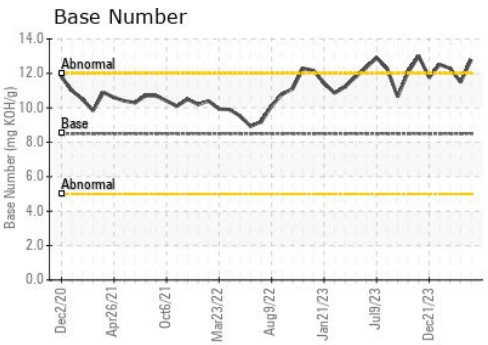
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0845828
Lab Number : 06157875
Unique Number : 10993298
Test Package : IND 2 (Additional Tests: KF)

Received : 23 Apr 2024
Tested : 25 Apr 2024
Diagnosed : 25 Apr 2024 - Sean Felton

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)

MARATHON PETROLEUM CO.
101 12TH ST
CATLETTSBURG, KY
US 41169
Contact: CORY GUMBERT
cagumbert@marathonpetroleum.com
T: (606)585-3950
F: x:

Report Id: MARCAT [WUSCAR] 06157875 (Generated: 04/25/2024 18:28:27) Rev: 1

Submitted By: M/V PAUL BLAZER