

OIL ANALYSIS REPORT

Sample Rating Trend

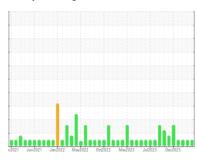


Louisville

[Louisville] Oil - Starboard Genset

Starboard Genset

MOBIL 15W40 (35 GAL)





Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

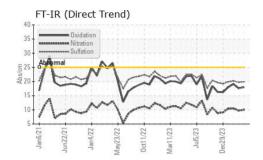
Fluid Condition

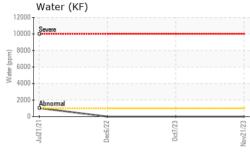
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

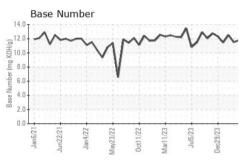
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0898524	WC0874754	WC0874805
Sample Date		Client Info		29 May 2024	28 Apr 2024	13 Mar 2024
Machine Age	hrs	Client Info		12742	12436	11979
Oil Age	hrs	Client Info		7037	9731	6275
Oil Changed	1110	Client Info		N/A	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	J	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Glycol		WC Method	7 1.0	NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>50	15	14	18
Chromium	ppm	ASTM D5185m	>4	<1	1	<1
Nickel		ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m	>_	<1	<1	0
Silver	ppm		>5	0	<1	0
Aluminum	ppm	ASTM D5185m ASTM D5185m	>5	2	2	1
Lead	ppm	ASTM D5185m	>12	2 <1	1	<1
	ppm			2	2	
Copper	ppm	ASTM D5185m		_		2
Tin	ppm	ASTM D5185m	>15	<1	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES						history2
ADDITIVEO		method	IIIIII/Dase	current	history1	HISTOLYZ
Boron	ppm	ASTM D5185m	IIIIII/Dase	11	10	12
	ppm ppm		IIIIII/Dase			
Boron	• •	ASTM D5185m	IIIIIIVDase	11	10	12
Boron Barium	ppm	ASTM D5185m ASTM D5185m	IIIIII/Dase	11 0	10 <1	12 0
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	IIIIII/Dase	11 0 63	10 <1 58	12 0 60
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	IIIIII/Dase	11 0 63 0	10 <1 58 <1	12 0 60
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	IIIIII/Dase	11 0 63 0 1435	10 <1 58 <1 1369	12 0 60 0 1419
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	IIIIIIIIIIII	11 0 63 0 1435 1124	10 <1 58 <1 1369 1119	12 0 60 0 1419 1131
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	11 0 63 0 1435 1124 994	10 <1 58 <1 1369 1119 1022	12 0 60 0 1419 1131 1067
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	11 0 63 0 1435 1124 994 1238	10 <1 58 <1 1369 1119 1022 1224	12 0 60 0 1419 1131 1067 1234
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	11 0 63 0 1435 1124 994 1238 3365	10 <1 58 <1 1369 1119 1022 1224 3250	12 0 60 0 1419 1131 1067 1234 3327
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	11 0 63 0 1435 1124 994 1238 3365 current	10 <1 58 <1 1369 1119 1022 1224 3250 history1	12 0 60 0 1419 1131 1067 1234 3327 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >118	11 0 63 0 1435 1124 994 1238 3365 current	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17	12 0 60 0 1419 1131 1067 1234 3327 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >118 >20	11 0 63 0 1435 1124 994 1238 3365 current 4	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3	12 0 60 0 1419 1131 1067 1234 3327 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >118 >20	11 0 63 0 1435 1124 994 1238 3365 current 4 2	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3 2	12 0 60 0 1419 1131 1067 1234 3327 history2 3 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >118 >20 >0.1	11 0 63 0 1435 1124 994 1238 3365 current 4 2 2 NEG	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3 2 NEG	12 0 60 0 1419 1131 1067 1234 3327 history2 3 2 2 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >118 >20 >0.1 limit/base	11 0 63 0 1435 1124 994 1238 3365 current 4 2 2 NEG	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3 2 NEG history1	12 0 60 0 1419 1131 1067 1234 3327 history2 3 2 2 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot %	ppm	ASTM D5185m ASTM D6304 method *ASTM D7844	limit/base >25 >118 >20 >0.1 limit/base	11 0 63 0 1435 1124 994 1238 3365 current 4 2 2 NEG current 0.2	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3 2 NEG history1 0.2	12 0 60 0 1419 1131 1067 1234 3327 history2 3 2 2 NEG history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304 method *ASTM D7844 *ASTM D7844	limit/base >25 >118 >20 >0.1 limit/base	11 0 63 0 1435 1124 994 1238 3365 current 4 2 2 NEG current 0.2 10.0	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3 2 NEG history1 0.2 9.7	12 0 60 0 1419 1131 1067 1234 3327 history2 3 2 2 NEG history2 0.2 10.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 *ASTM D7624 *ASTM D7624 *ASTM D7615 method	limit/base >25 >118 >20 >0.1 limit/base >20 >30 limit/base	11 0 63 0 1435 1124 994 1238 3365 current 4 2 2 NEG current 0.2 10.0 19.9 current	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3 2 NEG history1 0.2 9.7 19.7 history1	12 0 60 0 1419 1131 1067 1234 3327 history2 3 2 2 NEG history2 0.2 10.5 20.2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304 method *ASTM D7844 *ASTM D7624 *ASTM D76145	limit/base >25 >118 >20 >0.1 limit/base >20 >30 limit/base	11 0 63 0 1435 1124 994 1238 3365 current 4 2 2 NEG current 0.2 10.0 19.9	10 <1 58 <1 1369 1119 1022 1224 3250 history1 17 3 2 NEG history1 0.2 9.7 19.7	12 0 60 0 1419 1131 1067 1234 3327 history2 3 2 2 NEG history2 0.2 10.5 20.2

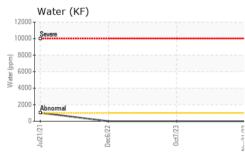


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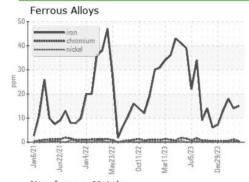


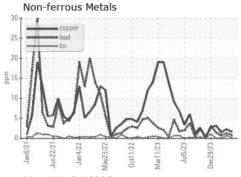


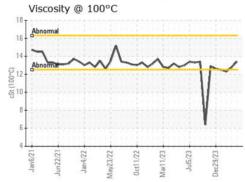
VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance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

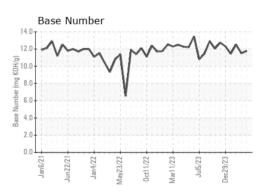
FLUID PROPER	RTIES	method			history2
Visc @ 100°C	cSt	ASTM D445	13.4	12.8	12.3

GRAPHS













Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0898524 Lab Number : 06204910 Unique Number : 11072371

Received **Tested** Diagnosed

: 10 Jun 2024 : 13 Jun 2024 : 13 Jun 2024 - Sean Felton

101 12TH ST CATLETTSBURG, KY US 41169

MARATHON PETROLEUM CO.

Contact: CORY GUMBERT cagumbert@marathonpetroleum.com

Test Package : IND 2 (Additional Tests: KF) Certificate 12367

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)

F: x:

T: (606)585-3950