

OIL ANALYSIS REPORT

Detroit [Detroit] Oil - Starboard Genset

Starboard Genset

MOBIL 15W40 (35 GAL)

Sample Rating Trend



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

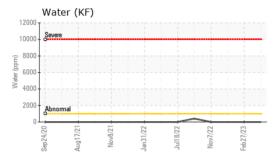
Fluid Condition

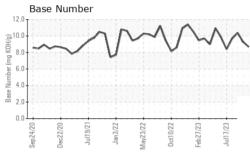
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

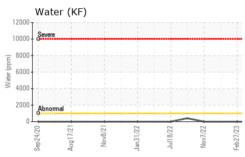
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0804851	WC0769346	WC0769338
Sample Date		Client Info		06 Nov 2023	09 Oct 2023	11 Sep 2023
Machine Age	hrs	Client Info		7612	7351	7023
Oil Age	hrs	Client Info		92	332	4
Oil Changed		Client Info		N/A	Not Changd	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATIO	N	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	9	4
Chromium	ppm	ASTM D5185m	>4	0	<1	0
Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>12	2	0	<1
Lead	ppm	ASTM D5185m	>17	0	<1	<1
Copper	ppm	ASTM D5185m	>70	0	1	<1
Tin	ppm	ASTM D5185m	>15	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 80	history1	history2 105
	ppm		limit/base		•	· ·
Boron		ASTM D5185m	limit/base	80	76	105
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	80 0	76 0	105 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	80 0 19	76 0 25	105 0 23
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	80 0 19 <1	76 0 25 <1	105 0 23 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	80 0 19 <1 245	76 0 25 <1 276	105 0 23 <1 283
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	80 0 19 <1 245 2154	76 0 25 <1 276 2355	105 0 23 <1 283 2377
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	limit/base	80 0 19 <1 245 2154 351	76 0 25 <1 276 2355 452	105 0 23 <1 283 2377 487
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	80 0 19 <1 245 2154 351 493	76 0 25 <1 276 2355 452 588	105 0 23 <1 283 2377 487 569
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	limit/base	80 0 19 <1 245 2154 351 493 3647	76 0 25 <1 276 2355 452 588 4637	105 0 23 <1 283 2377 487 569 4243
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	80 0 19 <1 245 2154 351 493 3647 current	76 0 25 <1 276 2355 452 588 4637 history1	105 0 23 <1 283 2377 487 569 4243 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	80 0 19 <1 245 2154 351 493 3647 current	76 0 25 <1 276 2355 452 588 4637 history1 3	105 0 23 <1 283 2377 487 569 4243 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	80 0 19 <1 245 2154 351 493 3647 current 4	76 0 25 <1 276 2355 452 588 4637 history1 3 0	105 0 23 <1 283 2377 487 569 4243 history2 6 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >118 >20	80 0 19 <1 245 2154 351 493 3647 current 4 2	76 0 25 <1 276 2355 452 588 4637 history1 3 0 2	105 0 23 <1 283 2377 487 569 4243 history2 6 1 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >25 >118 >20 limit/base	80 0 19 <1 245 2154 351 493 3647 current 4 2 0	76 0 25 <1 276 2355 452 588 4637 history1 3 0 2	105 0 23 <1 283 2377 487 569 4243 history2 6 1 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >25 >118 >20 limit/base	80 0 19 <1 245 2154 351 493 3647 current 4 2 0 current 0.1	76 0 25 <1 276 2355 452 588 4637 history1 3 0 2 history1 0.2	105 0 23 <1 283 2377 487 569 4243 history2 6 1 <1 history2 0.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >25 >118 >20 limit/base >20	80 0 19 <1 245 2154 351 493 3647 current 4 2 0 current 0.1 7.1	76 0 25 <1 276 2355 452 588 4637 history1 3 0 2 history1 0.2 8.9	105 0 23 <1 283 2377 487 569 4243 history2 6 1 <1 history2 0.1 7.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m Method *ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D76145	limit/base >25 >118 >20 limit/base >20 >30	80 0 19 <1 245 2154 351 493 3647 current 4 2 0 current 0.1 7.1 20.6	76 0 25 <1 276 2355 452 588 4637 history1 3 0 2 history1 0.2 8.9 20.3	105 0 23 <1 283 2377 487 569 4243 history2 6 1 <1 history2 0.1 7.4 20.2



OIL ANALYSIS REPORT

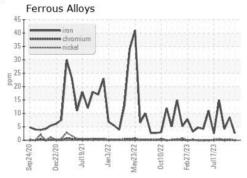


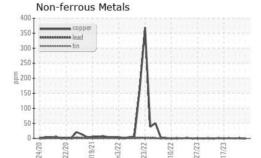


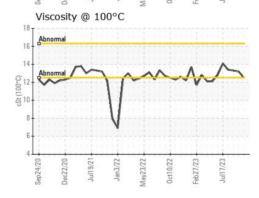


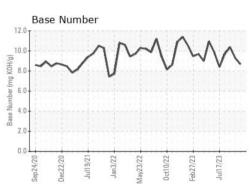
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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			history2
Visc @ 100°C	cSt	ASTM D445	12.5	13.2	13.3













Certificate L2367

Laboratory Sample No. Lab Number **Unique Number**

: WC0804851 : 06008541 : 10742303

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

: 17 Nov 2023 Diagnostician : Sean Felton Test Package : IND 2 (Additional Tests: KF)

: 15 Nov 2023

Contact: SHAWN MCCLASKEY stmcclaskey@marathonpetroleum.com

MARATHON PETROLEUM CO.

T: (606)739-2416 F: x:

CATLETTSBURG, KY

101 12TH ST

US 41169

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)

Report Id: MARCAT [WUSCAR] 06008541 (Generated: 11/17/2023 16:25:59) Rev: 1

Submitted By: M/V DETROIT