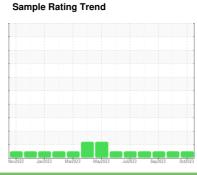


OIL ANALYSIS REPORT

West Virginia [West Virginia] Oil - Starboard Genset

Starboard Genset

MARATHON 15W40 (8 GAL)





Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Thurman Richardson

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

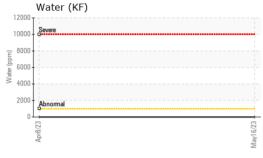
Fluid Condition

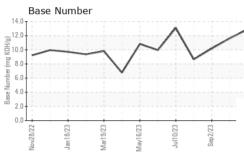
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

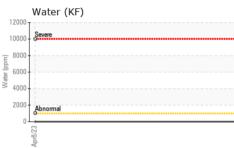
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0805464	WC0804887	WC0805328
Sample Date		Client Info		27 Oct 2023	02 Oct 2023	02 Sep 2023
Machine Age	hrs	Client Info		25832	25208	25127
Oil Age	hrs	Client Info		1005	437	276
Oil Changed		Client Info		N/A	Not Changd	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	٧	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	5	4	4
Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m		<1	<1	<1
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>12	3	0	<1
Lead	ppm	ASTM D5185m	>17	<1	<1	0
Copper	ppm	ASTM D5185m	>70	<1	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	<1
Cadmium	ppm	ASTM D5185m		<1	<1	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 57	history1 72	history2 70
	ppm		limit/base			
Boron		ASTM D5185m	limit/base	57	72	70
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	57 <1	72 0	70 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	57 <1 83	72 0 77	70 0 76
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	57 <1 83 0	72 0 77 <1	70 0 76 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	57 <1 83 0 1250	72 0 77 <1 1224	70 0 76 <1 1193
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	57 <1 83 0 1250 1218	72 0 77 <1 1224 1226	70 0 76 <1 1193 1278
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	57 <1 83 0 1250 1218 978	72 0 77 <1 1224 1226 936	70 0 76 <1 1193 1278 926
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	57 <1 83 0 1250 1218 978 1217	72 0 77 <1 1224 1226 936 1159	70 0 76 <1 1193 1278 926 1139
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 ASTM D5185m	limit/base	57 <1 83 0 1250 1218 978 1217 3699	72 0 77 <1 1224 1226 936 1159 3186	70 0 76 <1 1193 1278 926 1139 3719
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	57 <1 83 0 1250 1218 978 1217 3699 current	72 0 77 <1 1224 1226 936 1159 3186 history1	70 0 76 <1 1193 1278 926 1139 3719 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	57 <1 83 0 1250 1218 978 1217 3699 current	72 0 77 <1 1224 1226 936 1159 3186 history1	70 0 76 <1 1193 1278 926 1139 3719 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	57 <1 83 0 1250 1218 978 1217 3699 current 3 4	72 0 77 <1 1224 1226 936 1159 3186 history1 3	70 0 76 <1 1193 1278 926 1139 3719 history2 3
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 >20	57 <1 83 0 1250 1218 978 1217 3699 current 3 4 2	72 0 77 <1 1224 1226 936 1159 3186 history1 3	70 0 76 <1 1193 1278 926 1139 3719 history2 3 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 >20 limit/base	57 <1 83 0 1250 1218 978 1217 3699 current 3 4 2 current	72 0 77 <1 1224 1226 936 1159 3186 history1 3 2 2	70 0 76 <1 1193 1278 926 1139 3719 history2 3 1 <1 history2
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 >20 limit/base	57 <1 83 0 1250 1218 978 1217 3699 current 3 4 2 current 0.1	72 0 77 <1 1224 1226 936 1159 3186 history1 3 2 2 history1 0.1	70 0 76 <1 1193 1278 926 1139 3719 history2 3 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 >20 limit/base >20	57 <1 83 0 1250 1218 978 1217 3699 current 3 4 2 current 0.1 9.6	72 0 77 <1 1224 1226 936 1159 3186 history1 3 2 2 history1 0.1 7.8	70 0 76 <1 1193 1278 926 1139 3719 history2 3 1 <1 history2 0.1 7.7
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 D7415	limit/base >25 >20 limit/base >20 >30	57 <1 83 0 1250 1218 978 1217 3699 current 3 4 2 current 0.1 9.6 22.2	72 0 77 <1 1224 1226 936 1159 3186 history1 3 2 2 history1 0.1 7.8 20.4	70 0 76 <1 1193 1278 926 1139 3719 history2 3 1 <1 history2 0.1 7.7 20.9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium 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 D5185m method *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415 method	limit/base >25 >20 limit/base >20 >30 limit/base	57 <1 83 0 1250 1218 978 1217 3699 current 3 4 2 current 0.1 9.6 22.2 current	72 0 77 <1 1224 1226 936 1159 3186 history1 3 2 2 history1 0.1 7.8 20.4 history1	70 0 76 <1 1193 1278 926 1139 3719 history2 3 1 <1 history2 0.1 7.7 20.9 history2



OIL ANALYSIS REPORT

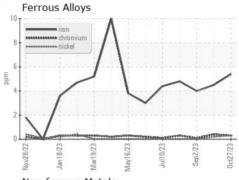


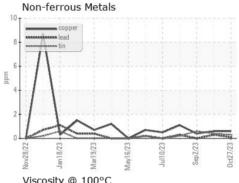


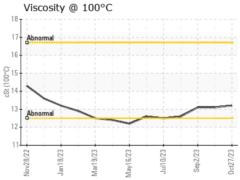


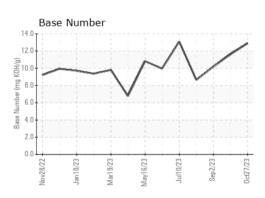
VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	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 PROPERTIES		method			history2
Visc @ 100°C	cSt	ASTM D445	13.2	13.1	13.1













Laboratory Sample No.

Lab Number Unique Number

: WC0805464 : 05995886 : 10724246

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

Diagnosed

: 02 Nov 2023

: 01 Nov 2023

Diagnostician : Sean Felton

Test Package : IND 2 (Additional Tests: KF)

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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. MARATHON PETROLEUM CO.

101 12TH ST CATLETTSBURG, KY US 41169

Contact: CORY GUMBERT cagumbert@marathonpetroleum.com

T: (606)585-3950 F: x: