

OIL ANALYSIS REPORT

Area Patoka [Patoka] Oil - Starboard Genset

Starboard Genset Fluid NOT GIVEN (35 GAL)

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: J. Harvey)

Wear

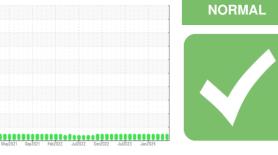
All component wear rates are normal.

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.

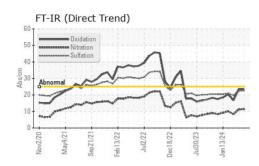


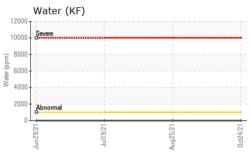
Sample Rating Trend

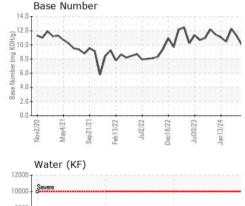
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0860082	WC0859906	WC0805571
Sample Date		Client Info		05 May 2024	09 Mar 2024	26 Feb 2024
Machine Age	hrs	Client Info		3840	3264	0
Oil Age	hrs	Client Info		3840	3264	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	۷	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
		mathad	limit/base	ourroat	biotomut	biotory ()
WEAR METALS		method		current	history1	history2
Iron	ppm	ASTM D5185m	>50	18	17	13
Chromium	ppm	ASTM D5185m	>4	2	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m	5	<1	0	<1
Silver	ppm	ASTM D5185m	>5	1	0	0
Aluminum	ppm	ASTM D5185m	>12	2	2	1
Lead	ppm	ASTM D5185m	>17	4	4	4
Copper	ppm	ASTM D5185m	>70	11	6	3
Tin	ppm	ASTM D5185m	>15	2	<1	1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES						history2
ADDITIVES		method	IIIIII/Dase	current	history1	
Boron	ppm	ASTM D5185m	IIIIII/Dase	9	11	13
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	inni/base	9 <1	11 0	13 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	IIIII/Dase	9 <1 69	11 0 64	13 0 64
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		9 <1 69 2	11 0 64 <1	13 0 64 1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		9 <1 69 2 1372	11 0 64 <1 1359	13 0 64 1 1384
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		9 <1 69 2 1372 1292	11 0 64 <1 1359 1286	13 0 64 1 1384 1365
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		9 <1 69 2 1372 1292 1047	11 0 64 <1 1359 1286 1047	13 0 64 1 1384 1365 1103
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		9 <1 69 2 1372 1292 1047 1327	11 0 64 <1 1359 1286 1047 1312	13 0 64 1 1384 1365 1103 1418
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		9 <1 69 2 1372 1292 1047	11 0 64 <1 1359 1286 1047	13 0 64 1 1384 1365 1103
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	limit/base	9 <1 69 2 1372 1292 1047 1327	11 0 64 <1 1359 1286 1047 1312	13 0 64 1 1384 1365 1103 1418
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	9 <1 69 2 1372 1292 1047 1327 2936	11 0 64 <1 1359 1286 1047 1312 2952	13 0 64 1 1384 1365 1103 1418 3390
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	limit/base	9 <1 69 2 1372 1292 1047 1327 2936 current	11 0 64 <1 1359 1286 1047 1312 2952 history1	13 0 64 1 1384 1365 1103 1418 3390 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base	9 <1 69 2 1372 1292 1047 1327 2936 <u>current</u> 6 43 2	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 6 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base	9 <1 69 2 1372 1292 1047 1327 2936 current 6 43	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20	9 <1 69 2 1372 1292 1047 1327 2936 <u>current</u> 6 43 2	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 6 <1
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 ASTM D5185m	limit/base >25 >20 >0.1	9 <1 69 2 1372 1292 1047 1327 2936 current 6 43 2 NEG	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2 2 NEG	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 <1 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 ASTM D5185m	limit/base >25 >20 >0.1 limit/base	9 <1 69 2 1372 1292 1047 1327 2936 <i>current</i> 6 43 2 NEG	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2 NEG history1	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 <1 NEG history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm %	ASTM D5185m ASTM D5185m	limit/base >25 >20 >0.1 limit/base	9 <1 69 2 1372 1292 1047 1327 2936 <i>current</i> 6 43 2 NEG <i>current</i> 0.2	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2 2 NEG history1 0.2	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 <1 NEG history2 0.1
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 D5185m	limit/base >25 >20 >0.1 limit/base	9 <1 69 2 1372 1292 1047 1327 2936 <i>current</i> 6 43 2 NEG <i>urrent</i> 0.2 11.4	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2 2 NEG history1 0.2 11.2	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 <1 NEG history2 0.1 8.3
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 D5185m	limit/base >25 >20 >0.1 limit/base >20 >20 >30	9 <1 69 2 1372 1292 1047 1327 2936 current 6 43 2 NEG current 0.2 11.4 22.6	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2 NEG history1 0.2 11.2 2.3	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 <1 NEG history2 0.1 8.3 19.7
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 D5185m	limit/base >25 >20 >0.1 limit/base >20 >30	9 <1 69 2 1372 1292 1047 1327 2936 <i>current</i> 6 43 2 NEG <i>n</i> EG 0.2 11.4 22.6	11 0 64 <1 1359 1286 1047 1312 2952 history1 6 12 2 NEG NEG history1 0.2 11.2 22.3	13 0 64 1 1384 1365 1103 1418 3390 history2 4 6 <1 NEG history2 0.1 8.3 19.7 history2

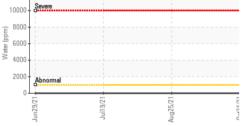


OIL ANALYSIS REPORT



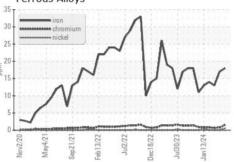


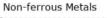


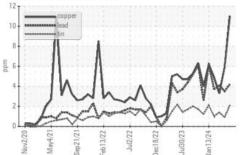


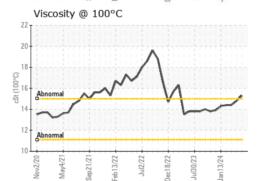
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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 PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		15.3	14.8	14.4
GRAPHS						

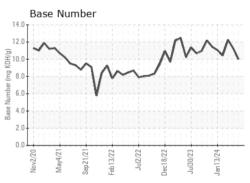












Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 MARATHON PETROLEUM CO. : WC0860082 Sample No. Received : 16 May 2024 101 12TH ST Lab Number : 06181544 Tested : 20 May 2024 CATLETTSBURG, KY Unique Number : 11032870 Diagnosed : 20 May 2024 - Sean Felton US 41169 Test Package : IND 2 (Additional Tests: KF) Contact: CORY GUMBERT Certificate 12367 cagumbert@marathonpetroleum.com To discuss this sample report, contact Customer Service at 1-800-237-1369. T: (606)585-3950 * - 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:

Report Id: MARCAT [WUSCAR] 06181544 (Generated: 05/20/2024 10:40:26) Rev: 1

Submitted By: M/V PATOKA