

OIL ANALYSIS REPORT

SAMPLE IN

Sample Rating Trend

NORMAL



Galveston Bay [Galveston Bay] Oil - Starboard Main

Starboard Main Engine

DIESEL ENGINE OIL SAE 15W40 (150 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

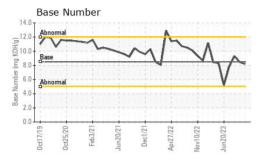
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

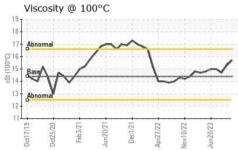
ı Enç	gine	22019 002202	0 Feb2021 Jun2	8021 Dec2021	Ap/2022 Nov/2022	Junž023	
NFORM	ATION	method	limit/ba	se	current	hi	istor
ber		Client Info		wc	0769372	WC07	355
		Client Info		28	Feb 2024	06 De	c 20
	hro	Client Info		Λ		0	

Sample Number		Client Info		WC0769372	WC0735552	WC0735525
Sample Date		Client Info		28 Feb 2024	06 Dec 2023	08 Nov 2023
Machine Age	hrs	Client Info		0	0	10617
Oil Age	hrs	Client Info		0	0	8297
Oil Changed		Client Info		N/A	N/A	Oil Added
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	1	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	43	32	30
Chromium	ppm	ASTM D5185m	>8	1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m	>3	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>15	2	2	1
Lead	ppm	ASTM D5185m	>18	11	9	8
Copper	ppm	ASTM D5185m	>80	7	5	6
Tin	ppm	ASTM D5185m	>14	2	1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 36	history1	history2 33
	ppm ppm				•	•
Boron		ASTM D5185m	250	36	37	33
Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10	36 0	37 0	33
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	36 0 41	37 0 36	33 0 34
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	36 0 41 1	37 0 36 <1	33 0 34 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	36 0 41 1 1166	37 0 36 <1 1074	33 0 34 <1 1050
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	36 0 41 1 1166 1517	37 0 36 <1 1074 1407	33 0 34 <1 1050 1395
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	250 10 100 450 3000 1150 1350	36 0 41 1 1166 1517	37 0 36 <1 1074 1407 955	33 0 34 <1 1050 1395 880
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 ASTM D5185m	250 10 100 450 3000 1150 1350	36 0 41 1 1166 1517 1071	37 0 36 <1 1074 1407 955 1171	33 0 34 <1 1050 1395 880 1147
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	250 10 100 450 3000 1150 1350 4250 limit/base	36 0 41 1 1166 1517 1071 1223 3446	37 0 36 <1 1074 1407 955 1171 3069	33 0 34 <1 1050 1395 880 1147 2965
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base	36 0 41 1 1166 1517 1071 1223 3446 current	37 0 36 <1 1074 1407 955 1171 3069 history1	33 0 34 <1 1050 1395 880 1147 2965 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base	36 0 41 1 1166 1517 1071 1223 3446 current	37 0 36 <1 1074 1407 955 1171 3069 history1	33 0 34 <1 1050 1395 880 1147 2965 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158	36 0 41 1 1166 1517 1071 1223 3446 current 5	37 0 36 <1 1074 1407 955 1171 3069 history1 3	33 0 34 <1 1050 1395 880 1147 2965 history2 3 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20	36 0 41 1 1166 1517 1071 1223 3446 current 5 3	37 0 36 <1 1074 1407 955 1171 3069 history1 3 3	33 0 34 <1 1050 1395 880 1147 2965 history2 3 2
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	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20	36 0 41 1 1166 1517 1071 1223 3446 current 5 3	37 0 36 <1 1074 1407 955 1171 3069 history1 3 4	33 0 34 <1 1050 1395 880 1147 2965 history2 3 2 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	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 limit/base	36 0 41 1 1166 1517 1071 1223 3446 current 5 3 current 0.3	37 0 36 <1 1074 1407 955 1171 3069 history1 3 4 history1 0.3	33 0 34 <1 1050 1395 880 1147 2965 history2 3 2 1 history2 0.3
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	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 limit/base	36 0 41 1 1166 1517 1071 1223 3446 current 5 3 current 0.3 13.0	37 0 36 <1 1074 1407 955 1171 3069 history1 3 4 history1 0.3 12.2	33 0 34 <1 1050 1395 880 1147 2965 history2 3 2 1 history2 0.3 12.1
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 D7844 *ASTM D7624 *ASTM D76145	250 10 100 450 3000 1150 1350 4250 limit/base >20 limit/base >20 >30	36 0 41 1 1166 1517 1071 1223 3446 current 5 3 3 current 0.3 13.0 27.1	37 0 36 <1 1074 1407 955 1171 3069 history1 3 4 history1 0.3 12.2 26.2	33 0 34 <1 1050 1395 880 1147 2965 history2 3 2 1 history2 0.3 12.1 26.0



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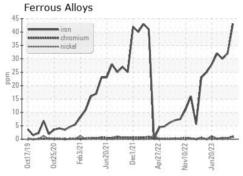


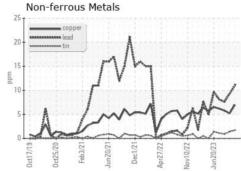


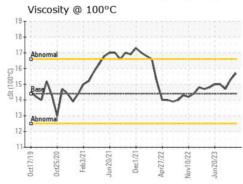
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

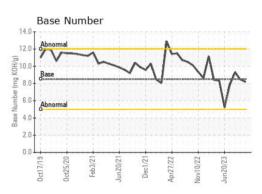
FLUID PROPER	TIES	method				history2
Visc @ 100°C	cSt	ASTM D445	14.4	15.7	15.3	14.7

GRAPHS













Certificate L2367

Laboratory Sample No.

: WC0769372 Lab Number : 06130828 Unique Number: 10950293 Test Package : IND 2

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 27 Mar 2024

Tested : 28 Mar 2024 Diagnosed : 01 Apr 2024 - Jonathan Hester MARATHON PETROLEUM CO.

101 12TH ST CATLETTSBURG, KY US 41169

Contact: SHAWN MCCLASKEY

stmcclaskey@marathonpetroleum.com T: (606)739-2416

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)

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