

OIL ANALYSIS REPORT

Sample Number

Oxidation

Abs/.1mm *ASTM D7414 >25

Base Number (BN) mg KOH/g ASTM D2896 8.5

Area Kentucky [Kentucky] Oil - Port Main Engine

Port Main Engine

Fluid **DIESEL ENGINE OIL SAE 15W40 (160 GAL)**

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Chris wray)

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 Number		Client Into		WC0090000	1100074391	110043000
Sample Date		Client Info		09 Jul 2024	25 May 2024	25 Apr 2024
Machine Age	hrs	Client Info		15731	14978	14450
Oil Age	hrs	Client Info		1688	935	406
Oil Changed		Client Info		Not Changd	N/A	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	24.0	NEG	NEG	NEG
-		WC Welliou		NEG	NLG	
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	4	2	1
Chromium	ppm	ASTM D5185m	>8	0	0	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m	>3	0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m	>15	<1	<1	2
Lead	ppm	ASTM D5185m	>18	0	1	<1
Copper	ppm	ASTM D5185m	>80	2	1	2
Tin	ppm	ASTM D5185m	>14	0	0	<1
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	250	23	0	10
Barium	ppm	ASTM D5185m	10	0	0	<1
	ppm	101111 00100111		•	Ū	
Molybdenum	nnm	ASTM D5185m	100	63	66	58
Molybdenum	ppm	ASTM D5185m	100	63 0	66	58 ~1
Manganese	ppm	ASTM D5185m		0	<1	<1
Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m	450	0 1510	<1 1652	<1 1328
Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	450 3000	0 1510 1356	<1 1652 1400	<1 1328 1186
Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	450 3000 1150	0 1510 1356 1136	<1 1652 1400 1237	<1 1328 1186 1043
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	450 3000 1150 1350	0 1510 1356 1136 1428	<1 1652 1400 1237 1555	<1 1328 1186 1043 1234
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	450 3000 1150 1350 4250	0 1510 1356 1136	<1 1652 1400 1237 1555 4568	<1 1328 1186 1043 1234 3333
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	450 3000 1150 1350 4250 limit/base	0 1510 1356 1136 1428 4058 current	<1 1652 1400 1237 1555 4568 history1	<1 1328 1186 1043 1234 3333 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	450 3000 1150 1350 4250 limit/base >20	0 1510 1356 1136 1428 4058 current 3	<1 1652 1400 1237 1555 4568 <u>history1</u> 3	<1 1328 1186 1043 1234 3333 history2 4
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	450 3000 1150 1350 4250 limit/base	0 1510 1356 1136 1428 4058 current	<1 1652 1400 1237 1555 4568 history1 3 2	<1 1328 1186 1043 1234 3333 history2 4 2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm 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	450 3000 1150 1350 4250 limit/base >20	0 1510 1356 1136 1428 4058 <u>current</u> 3 3 3 0	<1 1652 1400 1237 1555 4568 history1 3 2 2 2	<1 1328 1186 1043 1234 3333 history2 4 2 2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	450 3000 1150 1350 4250 imit/base >20 >158	0 1510 1356 1136 1428 4058 current 3 3 3	<1 1652 1400 1237 1555 4568 history1 3 2	<1 1328 1186 1043 1234 3333 history2 4 2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm 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	450 3000 1150 1350 4250 limit/base >20 >158 >20	0 1510 1356 1136 1428 4058 <u>current</u> 3 3 3 0	<1 1652 1400 1237 1555 4568 history1 3 2 2 2	<1 1328 1186 1043 1234 3333 history2 4 2 2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm 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	450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1	0 1510 1356 1136 1428 4058 current 3 3 0 NEG	<1 1652 1400 1237 1555 4568 history1 3 2 2 2 NEG	<1 1328 1186 1043 1234 3333 history2 4 2 2 NEG
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED	ppm 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	450 3000 1150 1350 4250 Iimit/base >20 >158 >20 >0.1	0 1510 1356 1136 1428 4058 current 3 3 0 NEG current	<1 1652 1400 1237 1555 4568 history1 3 2 2 2 NEG history1	<1 1328 1186 1043 1234 3333 history2 4 2 2 NEG history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm %	ASTM D5185m ASTM D5185m	450 3000 1150 1350 4250 Iimit/base >20 >158 >20 >0.1	0 1510 1356 1136 1428 4058 <u>current</u> 3 3 0 NEG <u>current</u> 0.2	<1 1652 1400 1237 1555 4568 <u>history1</u> 3 2 2 2 NEG <u>history1</u> 0.2	<1 1328 1186 1043 1234 3333 history2 4 2 2 NEG history2 0.1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration	ppm ppm 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 D6304 method *ASTM D7844 *ASTM D7844	450 3000 1150 1350 4250 imit/base >20 >158 >20 >0.1 imit/base	0 1510 1356 1136 1428 4058 <u>current</u> 3 3 0 NEG <u>current</u> 0.2 9.3	<1 1652 1400 1237 1555 4568 history1 3 2 2 2 NEG NEG history1 0.2 8.6	<1 1328 1186 1043 1234 3333 history2 4 2 2 NEG history2 0.1 7.4

18.2

12.19

15.6

11.87

16.3

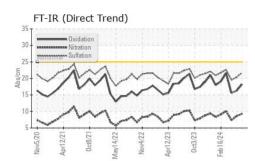
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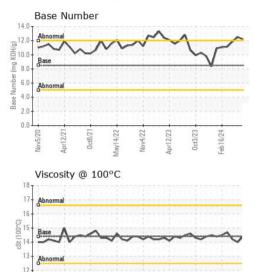


Nov5/20

Apr12/21

OIL ANALYSIS REPORT





Vov4/22

/av14/22

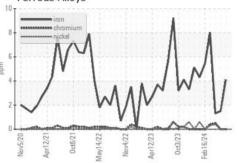
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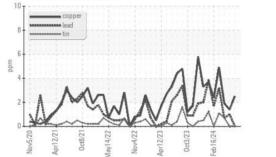
Feb16/24

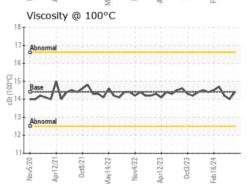
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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	14.4	14.4	14.0	14.2
CDADUS						

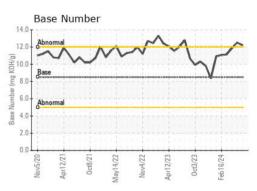
Ferrous Alloys

Non-ferrous Metals









Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 MARATHON PETROLEUM CO. : WC0898606 Sample No. Received : 15 Jul 2024 101 12TH ST Lab Number : 06236280 Tested : 16 Jul 2024 CATLETTSBURG, KY Unique Number : 11125114 Diagnosed : 16 Jul 2024 - Sean Felton US 41169 Test Package : IND 2 (Additional Tests: KF) Contact: CORY GUMBERT Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. cagumbert@marathonpetroleum.com 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] 06236280 (Generated: 07/16/2024 15:16:12) Rev: 1

Submitted By: M/V KENTUCKY

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