

OIL ANALYSIS REPORT

Kentucky [Kentucky] Oil - Port Main Engine

Port Main Engine

DIESEL ENGINE OIL SAE 15W40 (216 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

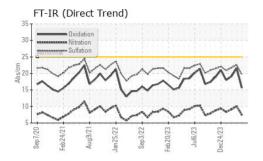
Fluid Condition

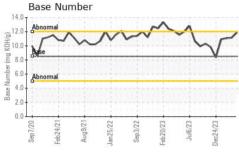
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

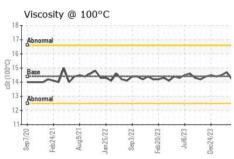
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0845806	WC0874827	WC0859784
Sample Date		Client Info		25 Apr 2024	16 Mar 2024	16 Feb 2024
Machine Age	hrs	Client Info		14450	13560	12942
Oil Age	hrs	Client Info		406	1453	1171
Oil Changed	1110	Client Info		N/A	Oil Added	N/A
Sample Status		Oliotic itilio		NORMAL	NORMAL	NORMAL
CONTAMINATION		method	limit/base			
	N			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	>75	1	8	5
Chromium	ppm	ASTM D5185m	>8	<1	<1	0
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m	>3	<1	<1	0
Silver	ppm	ASTM D5185m	>2	<1	<1	0
Aluminum	ppm	ASTM D5185m	>15	2	2	<1
Lead	ppm	ASTM D5185m	>18	<1	3	2
Copper	ppm	ASTM D5185m	>80	2	5	2
Tin	ppm	ASTM D5185m	>14	<1	1	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		<1	<1	0
ADDITIVES -		ام مالم مما	limit/bass		la la tament	history2
ADDITIVES		method				HISTOLYZ
Boron	ppm	ASTM D5185m	250	current 10	19	21
	ppm					
Boron Barium	ppm	ASTM D5185m	250	10	19	21
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	250 10	10 <1	19 0	21 0
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	10 <1 58	19 0 59	21 0 54
Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	10 <1 58 <1	19 0 59 <1	21 0 54 <1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	10 <1 58 <1 1328	19 0 59 <1 1117	21 0 54 <1 1104
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	10 <1 58 <1 1328 1186	19 0 59 <1 1117 1345	21 0 54 <1 1104 1383
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	10 <1 58 <1 1328 1186 1043	19 0 59 <1 1117 1345 1096	21 0 54 <1 1104 1383 988
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	10 <1 58 <1 1328 1186 1043 1234	19 0 59 <1 1117 1345 1096 1299	21 0 54 <1 1104 1383 988 1278
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	250 10 100 450 3000 1150 1350 4250 limit/base	10 <1 58 <1 1328 1186 1043 1234 3333	19 0 59 <1 1117 1345 1096 1299 3230	21 0 54 <1 1104 1383 988 1278 3213
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 >20	10 <1 58 <1 1328 1186 1043 1234 3333 current	19 0 59 <1 1117 1345 1096 1299 3230 history1	21 0 54 <1 1104 1383 988 1278 3213 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 >20 >158	10 <1 58 <1 1328 1186 1043 1234 3333 current	19 0 59 <1 1117 1345 1096 1299 3230 history1	21 0 54 <1 1104 1383 988 1278 3213 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 >20	10 <1 58 <1 1328 1186 1043 1234 3333 current 4	19 0 59 <1 1117 1345 1096 1299 3230 history1 4	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20	10 <1 58 <1 1328 1186 1043 1234 3333 current 4 2 2	19 0 59 <1 1117 1345 1096 1299 3230 history1 4 4	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3 0
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	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1	10 <1 58 <1 1328 1186 1043 1234 3333 current 4 2 NEG current	19 0 59 <1 1117 1345 1096 1299 3230 history1 4 4 2 NEG history1	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3 0 NEG
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 D6304	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1 limit/base	10 <1 58 <1 1328 1186 1043 1234 3333 current 4 2 NEG current 0.1	19 0 59 <1 1117 1345 1096 1299 3230 history1 4 4 2 NEG history1 0.2	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3 0 NEG history2
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	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1 limit/base	10 <1 58 <1 1328 1186 1043 1234 3333 current 4 2 2 NEG current 0.1 7.4	19 0 59 <1 1117 1345 1096 1299 3230 history1 4 4 2 NEG history1 0.2 10.1	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3 0 NEG history2 0.1 9.1
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 D6304 method *ASTM D7844 *ASTM D7624 *ASTM D76145	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1 limit/base	10 <1 58 <1 1328 1186 1043 1234 3333 current 4 2 NEG current 0.1 7.4 19.5	19 0 59 <1 1117 1345 1096 1299 3230 history1 4 4 2 NEG history1 0.2 10.1 22.6	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3 0 NEG history2 0.1 9.1 21.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D6304 *ASTM D7624 *ASTM D7624 *ASTM D7615 method	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1 limit/base	10 <1 58 <1 1328 1186 1043 1234 3333 current 4 2 2 NEG current 0.1 7.4 19.5 current	19 0 59 <1 1117 1345 1096 1299 3230 history1 4 4 2 NEG history1 0.2 10.1 22.6 history1	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3 0 NEG history2 0.1 9.1 21.7 history2
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 D6304 method *ASTM D7844 *ASTM D7624 *ASTM D76145	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1 limit/base >20 >30 limit/base	10 <1 58 <1 1328 1186 1043 1234 3333 current 4 2 NEG current 0.1 7.4 19.5	19 0 59 <1 1117 1345 1096 1299 3230 history1 4 4 2 NEG history1 0.2 10.1 22.6	21 0 54 <1 1104 1383 988 1278 3213 history2 2 3 0 NEG history2 0.1 9.1 21.7



OIL ANALYSIS REPORT



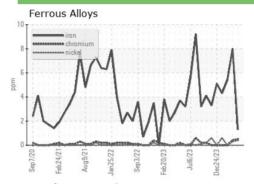


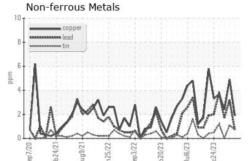


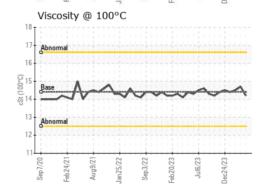
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	MODER	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

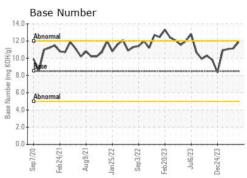
FLUID PROPERTIES		method				history2	
	Visc @ 100°C	cSt	ASTM D445	14.4	14.2	14.7	14.5

GRAPHS













Certificate 12367

Laboratory Sample No.

Lab Number : 06181571 Unique Number : 11032897

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0845806

Received : 16 May 2024 **Tested** Diagnosed

: 20 May 2024 : 20 May 2024 - Sean Felton

101 12TH ST CATLETTSBURG, KY

Contact: CORY GUMBERT cagumbert@marathonpetroleum.com

* - 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)

Test Package : IND 2 (Additional Tests: KF)

To discuss this sample report, contact Customer Service at 1-800-237-1369.

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

Report Id: MARCAT [WUSCAR] 06181571 (Generated: 05/20/2024 10:49:28) Rev: 1

MARATHON PETROLEUM CO.

US 41169