

OIL ANALYSIS REPORT

Sample Rating Trend





Canton
Machine Id
[Canton] Oil - Port Main Engine
Component
Dept Main Engine

Port Main Engine

DIESEL ENGINE OIL SAE 15W40 (150 GAL)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil

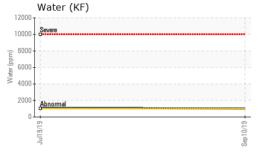
Fluid Condition

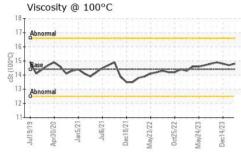
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

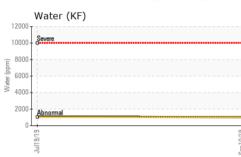
SAMPLE INFORM	MOITAN	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0805431	WC0805426	WC0805396
Sample Date		Client Info		27 Feb 2024	01 Feb 2024	14 Dec 2023
Machine Age	hrs	Client Info		0	15361	14356
Oil Age	hrs	Client Info		0	9514	8509
Oil Changed		Client Info		N/A	Oil Added	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	١	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	>75	45	39	34
Chromium	ppm	ASTM D5185m	>8	0	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m	>3	0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	1	2	3
Lead	ppm	ASTM D5185m	>18	4	5	5
Copper	ppm	ASTM D5185m	>80	3	4	4
Tin	ppm	ASTM D5185m	>14	0	<1	1
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
A D D ITIV (E O						
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	method ASTM D5185m	limit/base 250	current 90	history1 101	97
	ppm					
Boron		ASTM D5185m	250	90 0 106	101 0 109	97
Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10 100	90 0	101 0 109 <1	97 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	90 0 106	101 0 109 <1 991	97 0 110 <1 1042
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	90 0 106 0	101 0 109 <1 991 1489	97 0 110 <1 1042 1480
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	90 0 106 0 1093 1588 828	101 0 109 <1 991 1489 885	97 0 110 <1 1042 1480 935
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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 1350	90 0 106 0 1093 1588	101 0 109 <1 991 1489 885 1104	97 0 110 <1 1042 1480 935 1155
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	90 0 106 0 1093 1588 828	101 0 109 <1 991 1489 885	97 0 110 <1 1042 1480 935
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	250 10 100 450 3000 1150 1350	90 0 106 0 1093 1588 828 1107 3225	101 0 109 <1 991 1489 885 1104 2850 history1	97 0 110 <1 1042 1480 935 1155
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	250 10 100 450 3000 1150 1350 4250 limit/base	90 0 106 0 1093 1588 828 1107 3225	101 0 109 <1 991 1489 885 1104 2850	97 0 110 <1 1042 1480 935 1155 2868
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158	90 0 106 0 1093 1588 828 1107 3225	101 0 109 <1 991 1489 885 1104 2850 history1	97 0 110 <1 1042 1480 935 1155 2868 history2 4
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	90 0 106 0 1093 1588 828 1107 3225 current 5 <1	101 0 109 <1 991 1489 885 1104 2850 history1 5 2	97 0 110 <1 1042 1480 935 1155 2868 history2 4 2 2
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	90 0 106 0 1093 1588 828 1107 3225 current 5	101 0 109 <1 991 1489 885 1104 2850 history1 5	97 0 110 <1 1042 1480 935 1155 2868 history2 4
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	90 0 106 0 1093 1588 828 1107 3225 current 5 <1 0 NEG	101 0 109 <1 991 1489 885 1104 2850 history1 5 2 0 NEG	97 0 110 <1 1042 1480 935 1155 2868 history2 4 2 2 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 D6304 method *ASTM D7844	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1	90 0 106 0 1093 1588 828 1107 3225 current 5 <1 0 NEG current	101 0 109 <1 991 1489 885 1104 2850 history1 5 2 0 NEG history1	97 0 110 <1 1042 1480 935 1155 2868 history2 4 2 2 NEG history2 0.5
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 D6304 method *ASTM D7844 *ASTM D7844	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1	90 0 106 0 1093 1588 828 1107 3225 current 5 <1 0 NEG current 0.5 13.2	101 0 109 <1 991 1489 885 1104 2850 history1 5 2 0 NEG history1 0.5 12.8	97 0 110 <1 1042 1480 935 1155 2868 history2 4 2 2 NEG history2 0.5 12.7
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 method *ASTM D7844	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1 limit/base	90 0 106 0 1093 1588 828 1107 3225 current 5 <1 0 NEG current	101 0 109 <1 991 1489 885 1104 2850 history1 5 2 0 NEG history1	97 0 110 <1 1042 1480 935 1155 2868 history2 4 2 2 NEG history2 0.5
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 D6304 method *ASTM D7844 *ASTM D7844	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 >0.1 limit/base	90 0 106 0 1093 1588 828 1107 3225 current 5 <1 0 NEG current 0.5 13.2	101 0 109 <1 991 1489 885 1104 2850 history1 5 2 0 NEG history1 0.5 12.8	97 0 110 <1 1042 1480 935 1155 2868 history2 4 2 2 NEG history2 0.5 12.7
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 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	90 0 106 0 1093 1588 828 1107 3225 current 5 <1 0 NEG current 0.5 13.2 27.9	101 0 109 <1 991 1489 885 1104 2850 history1 5 2 0 NEG history1 0.5 12.8 27.5	97 0 110 <1 1042 1480 935 1155 2868 history2 4 2 2 NEG history2 0.5 12.7 27.6



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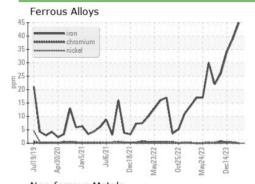


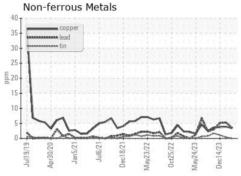


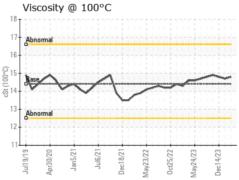
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

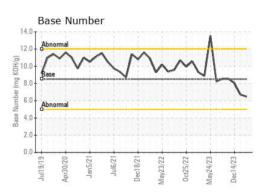
FLUID PROPERTIES		method	ilmit/base		nistory i	nistory∠
Visc @ 100°C	cSt	ASTM D445	14.4	14.8	14.7	14.8

GRAPHS













Report Id: MARCAT [WUSCAR] 06122613 (Generated: 03/21/2024 19:39:25) Rev: 1

Laboratory Sample No. Lab Number : 06122613 Unique Number : 10936764

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0805431

Received **Tested**

Diagnosed Test Package : IND 2 (Additional Tests: KF)

: 21 Mar 2024 : 21 Mar 2024 - Jonathan Hester

: 19 Mar 2024

101 12TH ST CATLETTSBURG, KY

MARATHON PETROLEUM CO.

US 41169

Contact: M/V CANTON mvcanton@marathonpetroleum.com

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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F: