

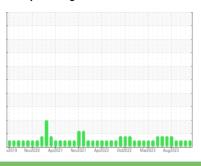
OIL ANALYSIS REPORT

Sample Rating Trend

Nashville [Nashville] Oil - Port Main Engine

Port Main Engine

MOBIL 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.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0805240	WC0805254	WC0769330
Sample Date		Client Info		27 Nov 2023	03 Oct 2023	05 Sep 2023
Machine Age	hrs	Client Info		56888	56249	55820
Oil Age	hrs	Client Info		1764	1126	700
Oil Changed		Client Info		N/A	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	٧	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	6	6	4
Chromium	ppm	ASTM D5185m	>8	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Titanium	ppm	ASTM D5185m	>3	0	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	1	2	1
Lead	ppm	ASTM D5185m	>18	<1	0	0
Copper	ppm	ASTM D5185m	>80	<1	<1	<1
Tin	ppm	ASTM D5185m	>14	<1	0	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 53	history1	history2 66
	ppm		limit/base			
Boron	• •	ASTM D5185m	limit/base	53	60	66
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	53 0	60 <1	66 2
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	53 0 37	60 <1 41	66 2 37
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	53 0 37 0 954 1624	60 <1 41 <1 865 1560	66 2 37 <1 849 1548
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	53 0 37 0 954 1624 1028	60 <1 41 <1 865 1560 995	66 2 37 <1 849 1548 987
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	limit/base	53 0 37 0 954 1624 1028 1279	60 <1 41 <1 865 1560 995 1225	66 2 37 <1 849 1548 987 1173
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	limit/base	53 0 37 0 954 1624 1028	60 <1 41 <1 865 1560 995	66 2 37 <1 849 1548 987
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	limit/base	53 0 37 0 954 1624 1028 1279 3017	60 <1 41 <1 865 1560 995 1225	66 2 37 <1 849 1548 987 1173
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		53 0 37 0 954 1624 1028 1279 3017	60 <1 41 <1 865 1560 995 1225 3493	66 2 37 <1 849 1548 987 1173 3318
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	53 0 37 0 954 1624 1028 1279 3017 current 3 <1	60 <1 41 <1 865 1560 995 1225 3493 history1	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >118 >20	53 0 37 0 954 1624 1028 1279 3017 current 3 <1	60 <1 41 <1 865 1560 995 1225 3493 history1 2 0 5	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >118 >20	53 0 37 0 954 1624 1028 1279 3017 current 3 <1	60 <1 41 <1 865 1560 995 1225 3493 history1 2	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >118 >20	53 0 37 0 954 1624 1028 1279 3017 current 3 <1	60 <1 41 <1 865 1560 995 1225 3493 history1 2 0 5	66 2 37 <1 849 1548 987 1173 3318 history2 3 <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	limit/base >20 >118 >20 >0.1	53 0 37 0 954 1624 1028 1279 3017 current 3 <1 3 NEG	60 <1 41 <1 865 1560 995 1225 3493 history1 2 0 5 NEG	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1 3 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	limit/base >20 >118 >20 >0.1 limit/base	53 0 37 0 954 1624 1028 1279 3017 current 3 <1 3 NEG	60 <1 41 41 <1 865 1560 995 1225 3493 history1 2 0 5 NEG history1	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1 3 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	limit/base >20 >118 >20 >0.1 limit/base	53 0 37 0 954 1624 1028 1279 3017 current 3 <1 3 NEG current 1.9	60 <1 41 41 <1 865 1560 995 1225 3493 history1 2 0 5 NEG history1 1.5	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1 3 NEG history2 1.2
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	limit/base >20 >118 >20 >0.1 limit/base >20	53 0 37 0 954 1624 1028 1279 3017 current 3 <1 3 NEG current 1.9 8.3	60 <1 41 41 <1 865 1560 995 1225 3493 history1 2 0 5 NEG history1 1.5 7.4	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1 3 NEG history2 1.2 7.1
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	limit/base >20 >118 >20 >0.1 limit/base >20 >0.1 limit/base	53 0 37 0 954 1624 1028 1279 3017 current 3 <1 3 NEG current 1.9 8.3 22.4	60 <1 41 41 <1 865 1560 995 1225 3493 history1 2 0 5 NEG history1 1.5 7.4 21.2	66 2 37 <1 849 1548 987 1173 3318 history2 3 <1 3 NEG history2 1.2 7.1 20.6



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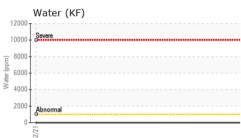


VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	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

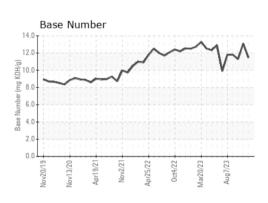
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FLUID PROPERTIES		method			history2
Visc @ 100°C	cSt	ASTM D445	15.9	15.5	15.2

Ferrous Alloys 12 Non-ferrous Metals



Viscosity @ 100°C cSt (100°C)







Certificate L2367

Laboratory

Sample No. Lab Number Unique Number : 10776463

: WC0805240 : 06026672

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

Diagnosed

: 06 Dec 2023 : 07 Dec 2023

Diagnostician : Sean Felton

Test Package : IND 2 (Additional Tests: KF)

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.

Contact: CORY GUMBERT cagumbert@marathonpetroleum.com

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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

101 12TH ST

US 41169

CATLETTSBURG, KY

MARATHON PETROLEUM CO.