

## **OIL ANALYSIS REPORT**

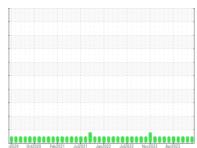
# Sample Rating Trend



Ohio Valley
[Ohio Valley] Oil - Port Main Engine

Component
Port Main Engine

**DIESEL ENGINE OIL SAE 15W40 (150 GAL)** 





### DIAGNOSIS

## Recommendation

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

#### Waar

All component wear rates are normal.

## Contamination

There is no indication of any contamination in the

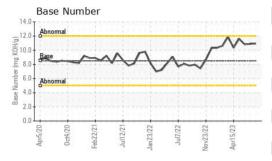
## **Fluid Condition**

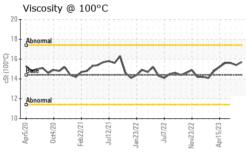
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	ΛΔΤΙΩΝ	method	limit/base	current	history1	history2
	MATION		— IIIIIV base		•	•
Sample Number		Client Info		WC0735736	WC0735768	WC0683578
Sample Date		Client Info		05 Aug 2023	09 Jul 2023	11 Jun 2023
Machine Age	hrs	Client Info		58945	58574	58044
Oil Age	hrs	Client Info		4077	3706	3176
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	V	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	12	12	12
Chromium	ppm	ASTM D5185m	>8	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>3	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	3	1	1
Lead	ppm	ASTM D5185m	>18	0	<1	<1
Copper	ppm	ASTM D5185m	>80	0	<1	<1
Tin	ppm	ASTM D5185m	>14	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 250	current 41	history1 42	history2 48
	ppm					
Boron Barium	ppm	ASTM D5185m	250	41	42	48
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	41 0	42 0	48 0
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m	250 10	41 0 25 <1	42 0 25	48 0 27
Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	41 0 25	42 0 25 <1	48 0 27 <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	41 0 25 <1 939	42 0 25 <1 988	48 0 27 <1 1031
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	41 0 25 <1 939 1613	42 0 25 <1 988 1677 773	48 0 27 <1 1031 1789 820
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	41 0 25 <1 939 1613 756	42 0 25 <1 988 1677	48 0 27 <1 1031 1789
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	41 0 25 <1 939 1613 756	42 0 25 <1 988 1677 773 986	48 0 27 <1 1031 1789 820 1035
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	41 0 25 <1 939 1613 756 948 3861	42 0 25 <1 988 1677 773 986 4020	48 0 27 <1 1031 1789 820 1035 4222
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	41 0 25 <1 939 1613 756 948 3861 current	42 0 25 <1 988 1677 773 986 4020 history1	48 0 27 <1 1031 1789 820 1035 4222 history2
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 >20 >158	41 0 25 <1 939 1613 756 948 3861 current	42 0 25 <1 988 1677 773 986 4020 history1	48 0 27 <1 1031 1789 820 1035 4222 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158	41 0 25 <1 939 1613 756 948 3861 current 3	42 0 25 <1 988 1677 773 986 4020 history1 3 <1	48 0 27 <1 1031 1789 820 1035 4222 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 ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20	41 0 25 <1 939 1613 756 948 3861 current 3 0 0	42 0 25 <1 988 1677 773 986 4020 history1 3 <1 2	48 0 27 <1 1031 1789 820 1035 4222 history2 3 2 4 history2
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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 limit/base	41 0 25 <1 939 1613 756 948 3861 current 3 0 0	42 0 25 <1 988 1677 773 986 4020 history1 3 <1 2 history1 2.1	48 0 27 <1 1031 1789 820 1035 4222 history2 3 2 4 history2 1.9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm	ASTM D5185m  method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 limit/base	41 0 25 <1 939 1613 756 948 3861 current 3 0 current 2.1 10.5	42 0 25 <1 988 1677 773 986 4020 history1 3 <1 2 history1 2.1 10.9	48 0 27 <1 1031 1789 820 1035 4222 history2 3 2 4 history2 1.9 10.4
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 D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844  *ASTM D7624  *ASTM D76145	250 10 100 450 3000 1150 1350 4250 limit/base >20 limit/base >20 >30	41 0 25 <1 939 1613 756 948 3861  current 3 0 current 2.1 10.5 23.5	42 0 25 <1 988 1677 773 986 4020 history1 3 <1 2 history1 2.1 10.9 24.1	48 0 27 <1 1031 1789 820 1035 4222 history2 3 2 4 history2 1.9 10.4 23.9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm	ASTM D5185m  method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m  method  *ASTM D7844  *ASTM D7844  *ASTM D7844  *ASTM D7844	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 limit/base >20 >imit/base	41 0 25 <1 939 1613 756 948 3861 current 3 0 current 2.1 10.5 23.5 current	42 0 25 <1 988 1677 773 986 4020 history1 3 <1 2 history1 2.1 10.9 24.1 history1	48 0 27 <1 1031 1789 820 1035 4222 history2 3 2 4 history2 1.9 10.4 23.9 history2
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 D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844  *ASTM D7624  *ASTM D76145	250 10 100 450 3000 1150 1350 4250 limit/base >20 >158 >20 limit/base >20 >30 limit/base	41 0 25 <1 939 1613 756 948 3861  current 3 0 current 2.1 10.5 23.5	42 0 25 <1 988 1677 773 986 4020 history1 3 <1 2 history1 2.1 10.9 24.1	48 0 27 <1 1031 1789 820 1035 4222 history2 3 2 4 history2 1.9 10.4 23.9



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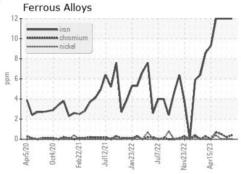


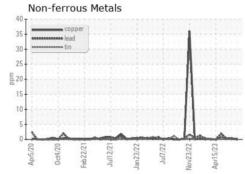


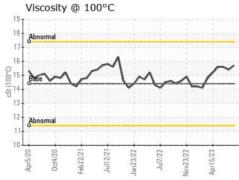
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

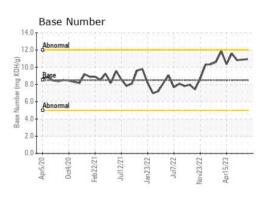
FLUID PROPER	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	14.4	15.7	15.4	15.6

## **GRAPHS**













Laboratory Sample No. Lab Number Unique Number : 10607400

: WC0735736 : 05927453

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

: 17 Aug 2023 Diagnostician : Angela Borella

: 18 Aug 2023

Test Package : IND 2 (Additional Tests: KF)

Contact: CORY GUMBERT cagumbert@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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