

OIL ANALYSIS REPORT

Kentucky Machine Id [Kentucky] Oil - Port Genset

Port Genset

DIESEL ENGINE OIL SAE 15W40 (35 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

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.



12013 M=2020 Aug2020 D=2020 M=2021 O=2022 Ap;2022 Ap;2023

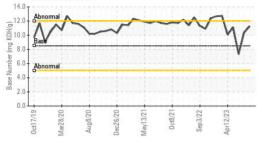
Sample Rating Trend

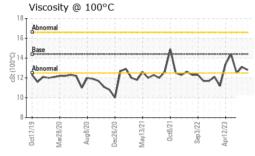
Sample Number Client Info WC0769671 WC0769571 WC0769571 WC0769571 I1 Jul 2023 Machine Age hrs Client Info 17839 17378 16461 Oil Age hrs Client Info 483 26 333 Oil Changed Client Info Changed Not Changed Changed Sample Status nethod imt/base current history1 history2 Fuel WC Method >4.0 <1.0	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
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Oil Changed Sample Status Client Info Changed NORMAL Not Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL CONTAMINATION method imit/base current history1 history2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Glycol WC Method >4.0 NEG NEG NEG WEAR METALS method imit/base current history1 history2 Iron ppm ASTM D518m >50 5 2 4 Chromium ppm ASTM D518m >4 <1 <1 0 Nickel ppm ASTM D518m >5 0 0 0 Silver ppm ASTM D518m >17 1 <1 2 <1 Lead ppm ASTM D518m >17 1 <1 0 0 Vanadium ppm ASTM D518m >10 0 0 <1 0 Vanadium ppm ASTM D518m 10 0 <1 0 0 Vanadium ppm ASTM D518m 10 2 0 0 <1 Vanadium ppm ASTM D518m 10	Machine Age	hrs	Client Info		17839	17378	16461
Oil Changed Sample Status Client Info Changed NORMAL NorRMAL NorRMAL NorRMAL NorRMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Glycol WC Method >4.0 <1.0 <1.0 <1.0 WEAR METALS method imit/base current history1 history2 Iron ppm ASTM D5185m >50 5 2 4 Chromium ppm ASTM D5185m >50 5 2 <1 0 Nickel ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >12 <1 2 <1 Lead ppm ASTM D5185m >15 0 <1 0 Vanadium ppm ASTM D5185m 15 0 <1 0 Vanadium ppm ASTM D5185m 10 <th>Oil Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>483</th> <th>26</th> <th>333</th>	Oil Age	hrs	Client Info		483	26	333
Sample Status NORMAL NORMAL NORMAL NORMAL CONTAMINATION method imit/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 >50 5 2 4 Chromium ppm ASTM D5185m >2 <1 0 0 Nickel ppm ASTM D5185m >5 0 0 0 Silver ppm ASTM D5185m >12 <1 2 1 Lead ppm ASTM D5185m >15 0 <1 0 Cadmium ppm ASTM D5185m >15 0 <1 0 Cadmium ppm ASTM D5185m 15 0 <1 0 Cadmium ppm	-		Client Info		Changed	Not Changd	Changed
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Silver ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >12 <1 2 <1 Lead ppm ASTM D5185m >17 1 <1 <1 Copper ppm ASTM D5185m >70 <1 <1 0 Vanadium ppm ASTM D5185m >15 0 <1 0 Cadmium ppm ASTM D5185m <1 0 0 <1 Cadmium ppm ASTM D5185m <1 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 100 2 0 0 Malybdenum ppm ASTM D5185m 100 50 53 52 Manganese ppm ASTM D5185m 100 0 <1 136 Zinc ppm ASTM D5185m 1350 1205	Nickel	ppm	ASTM D5185m	>2	<1	0	0
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Lead ppm ASTM D5185m >17 1 <1	Silver	ppm	ASTM D5185m	>5	0	0	0
Copper ppm ASTM D5185m >70 <1	Aluminum	ppm	ASTM D5185m	>12	<1	2	<1
Tin ppm ASTM D5185m >15 0 <1	Lead	ppm	ASTM D5185m	>17	1	<1	<1
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ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 23 43 29 Barium ppm ASTM D5185m 10 2 0 0 Molybdenum ppm ASTM D5185m 100 50 53 52 Manganese ppm ASTM D5185m 100 0 0 <1 Magnesium ppm ASTM D5185m 450 775 694 749 Calcium ppm ASTM D5185m 450 775 694 749 Calcium ppm ASTM D5185m 450 775 694 749 Calcium ppm ASTM D5185m 3000 1333 1432 1574 Phosphorus ppm ASTM D5185m 1205 1231 1290 Sulfur ppm ASTM D5185m 25 3 4 3 Sodium ppm ASTM D5185m >158 2 <th>Vanadium</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th>0</th> <th>0</th> <th><1</th>	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron ppm ASTM D5185m 250 23 43 29 Barium ppm ASTM D5185m 10 2 0 0 Molybdenum ppm ASTM D5185m 100 50 53 52 Manganese ppm ASTM D5185m 100 50 694 749 Calcium ppm ASTM D5185m 450 775 694 749 Calcium ppm ASTM D5185m 450 775 694 749 Calcium ppm ASTM D5185m 3000 1333 1432 1574 Phosphorus ppm ASTM D5185m 1150 983 1116 1036 Zinc ppm ASTM D5185m 1350 1205 1231 1290 Sulfur ppm ASTM D5185m 25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <th>Cadmium</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th><1</th> <th>0</th> <th>0</th>	Cadmium	ppm	ASTM D5185m		<1	0	0
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Magnesium ppm ASTM D5185m 450 775 694 749 Calcium ppm ASTM D5185m 3000 1333 1432 1574 Phosphorus ppm ASTM D5185m 1150 983 1116 1036 Zinc ppm ASTM D5185m 1350 1205 1231 1290 Sulfur ppm ASTM D5185m 4250 3004 3954 3762 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Potassium ppm ASTM D5185m >20 2 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.2 0.1 0.2 Nitration Abs/.mm *ASTM D7415 >30	Boron		ASTM D5185m	250	23	43	29
Calcium ppm ASTM D5185m 3000 1333 1432 1574 Phosphorus ppm ASTM D5185m 1150 983 1116 1036 Zinc ppm ASTM D5185m 1350 1205 1231 1290 Sulfur ppm ASTM D5185m 4250 3004 3954 3762 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >158 2 <1 2 Potassium ppm ASTM D5185m >20 2 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.2 0.1 0.2 Nitration Abs/.mm *ASTM D7844 0.2 0.1 0.2 Sulfation Abs/.imm *ASTM D7845 >30 20.9<	Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10	23 2	43 0	29 0
Phosphorus ppm ASTM D5185m 1150 983 1116 1036 Zinc ppm ASTM D5185m 1350 1205 1231 1290 Sulfur ppm ASTM D5185m 4250 3004 3954 3762 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 2 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.2 0.1 0.2 Nitration Abs/.mm *ASTM D7415 >30 20.9 19.0 20.7 FLUID DEGRADATION method limit/base current	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	23 2 50	43 0 53	29 0 52
Zinc ppm ASTM D5185m 1350 1205 1231 1290 Sulfur ppm ASTM D5185m 4250 3004 3954 3762 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >158 2 <1 2 Potassium ppm ASTM D5185m >158 2 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.2 0.1 0.2 Nitration Abs/cm *ASTM D7624 >20 8.0 6.1 7.6 Sulfation Abs/.tmm *ASTM D715 >30 20.9 19.0 20.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	23 2 50 0	43 0 53 0	29 0 52 <1
Sulfur ppm ASTM D5185m 4250 3004 3954 3762 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >158 2 <1 2 Potassium ppm ASTM D5185m >20 2 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.2 0.1 0.2 Nitration Abs/cm *ASTM D7624 >20 8.0 6.1 7.6 Sulfation Abs/.tmm *ASTM D7415 >30 20.9 19.0 20.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 17.2 15.3 16.7	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	23 2 50 0 775	43 0 53 0 694	29 0 52 <1 749
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >158 2 <1 2 Potassium ppm ASTM D5185m >20 2 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.2 0.1 0.2 Nitration Abs/cm *ASTM D7624 >20 8.0 6.1 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 19.0 20.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.2 15.3 16.7	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	23 2 50 0 775 1333	43 0 53 0 694 1432	29 0 52 <1 749 1574
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Sodium ppm ASTM D5185m >158 2 <1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm 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 1350	23 2 50 0 775 1333 983 1205	43 0 53 0 694 1432 1116 1231	29 0 52 <1 749 1574 1036 1290
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Nitration Abs/cm *ASTM D7624 >20 8.0 6.1 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 19.0 20.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.2 15.3 16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158	23 2 50 0 775 1333 983 1205 3004 current 3 2	43 0 53 0 694 1432 1116 1231 3954 <u>history1</u> 4 <1	29 0 52 <1 749 1574 1036 1290 3762 history2 3 2
Sulfation Abs/.1mm *ASTM D7415 >30 20.9 19.0 20.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.2 15.3 16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20	23 2 50 0 775 1333 983 1205 3004 current 3 2 2 2	43 0 53 0 694 1432 1116 1231 3954 history1 4 <1 1	29 0 52 <1 749 1574 1036 1290 3762 history2 3 2 0
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Oxidation Abs/.1mm *ASTM D7414 >25 17.2 15.3 16.7	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	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 limit/base	23 2 50 0 775 1333 983 1205 3004 <i>current</i> 3 2 2 2 <i>current</i> 0.2	43 0 53 0 694 1432 1116 1231 3954 history1 4 <1 1 1 history1 0.1	29 0 52 <1 749 1574 1036 1290 3762 history2 3 2 0 history2 0.2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 limit/base	23 2 50 0 775 1333 983 1205 3004 <i>current</i> 3 2 2 2 <i>current</i> 0.2 8.0	43 0 53 0 694 1432 1116 1231 3954 history1 4 <1 1 1 history1 0.1 6.1	29 0 52 <1 749 1574 1036 1290 3762 history2 3 2 0 history2 0.2 7.6
	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 ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >25 >158 >20 imit/base	23 2 50 0 775 1333 983 1205 3004 current 3 2 2 2 2 current 0.2 8.0 20.9	43 0 53 0 694 1432 1116 1231 3954 history1 4 <1 1 1 history1 0.1 6.1 19.0	29 0 52 <1 749 1574 1036 1290 3762 history2 3 2 0 history2 0.2 7.6 20.7
	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 ASTM D7844 *ASTM D7624 *ASTM D7415	250 10 100 450 3000 1150 1350 4250 iimit/base >25 >158 >20 iimit/base >20 >30	23 2 50 0 775 1333 983 1205 3004 <i>current</i> 3 2 2 2 <i>current</i> 0.2 8.0 20.9	43 0 53 0 694 1432 1116 1231 3954 history1 4 <1 1 1 history1 0.1 6.1 19.0 history1	29 0 52 <1 749 1574 1036 1290 3762 history2 3 2 0 history2 0.2 7.6 20.7 history2



OIL ANALYSIS REPORT

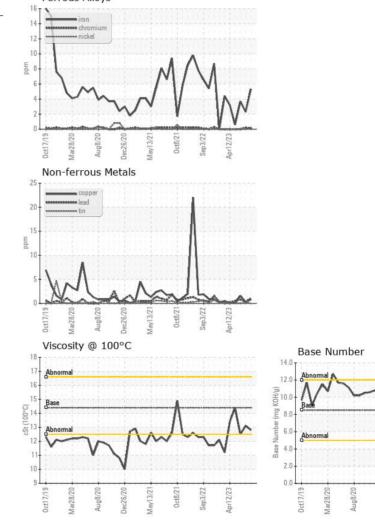
Base Number





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	12.8	13.1	12.5
GRAPHS						

Ferrous Alloys



Sen3/22. Apr12/23 Dec26/20 May13/21 MARATHON PETROLEUM CO. : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 06 Nov 2023 101 12TH ST : 07 Nov 2023 CATLETTSBURG, KY Diagnosed Diagnostician : Wes Davis US 41169 Contact: CORY GUMBERT To discuss this sample report, contact Customer Service at 1-800-237-1369. cagumbert@marathonpetroleum.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (606)585-3950 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F: x:



Certificate L2367

Laboratory

Sample No.

Lab Number

Unique Number : 10727576

Test Package : IND 2

: WC0769071

:05999216

Submitted By: M/V KENTUCKY

Oct8/21