

OIL ANALYSIS REPORT

Area Catlettsburg [Catlettsburg] Oil - Port Main Engine Component

Port Main Engine

ZINC-FREE ENGINE OIL SAE 40 (150 GAL)

Recommendation

Resample at the next service interval to monitor. The fluid was not specified, however, a fluid match indicates that this fluid is (GENERIC) ZINC-FREE ENGINE OIL SAE 40. Please confirm.

Wear

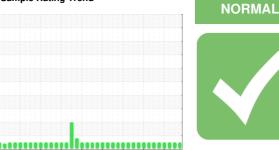
All component wear rates are normal.

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.



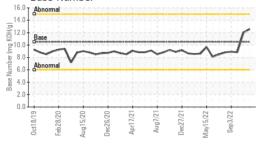
Sample Rating Trend

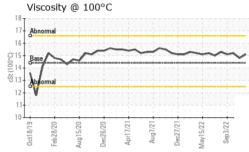
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0769496	WC0769540	WC0731823
Sample Date		Client Info		08 Aug 2023	21 Jun 2023	01 Oct 2022
Machine Age	hrs	Client Info		0	18877	0
Oil Age	hrs	Client Info		19497	18877	16718
Oil Changed		Client Info		Not Changd	Oil Added	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	N	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	15	12	13
Chromium	ppm	ASTM D5185m	>8	2	1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>3	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	4	<1	2
Lead	ppm	ASTM D5185m	>18	3	1	4
Copper	ppm	ASTM D5185m	>80	7	8	10
Tin	ppm	ASTM D5185m	>14	5	3	3
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 50	current 6	history1 1	history2 0
	ppm ppm		50			
Boron		ASTM D5185m	50	6	1	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	50 5	6 0	1 0	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	50 5	6 0 25	1 0 30	0 0 58
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 37	6 0 25 <1	1 0 30 0	0 0 58 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 37 12 3250 50	6 0 25 <1 16 4469 35	1 0 30 0 31 4047 40	0 0 58 0 22
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 37 12 3250 50 5	6 0 25 <1 16 4469	1 0 30 0 31 4047 40 <1	0 0 58 0 22 3368 56 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 37 12 3250 50 5	6 0 25 <1 16 4469 35	1 0 30 0 31 4047 40	0 0 58 0 22 3368 56
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	50 5 37 12 3250 50 5	6 0 25 <1 16 4469 35 3	1 0 30 0 31 4047 40 <1	0 0 58 0 22 3368 56 0
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	50 5 37 12 3250 50 5 5750 limit/base	6 0 25 <1 16 4469 35 3 3 4431	1 0 30 0 31 4047 40 <1 4143	0 0 58 0 22 3368 56 0 4029
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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	50 5 37 12 3250 50 5 5750 limit/base	6 0 25 <1 16 4469 35 3 3 4431 current	1 0 30 0 31 4047 40 <1 4143 history1	0 0 58 0 22 3368 56 0 4029 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	50 5 37 12 3250 50 5 5750 I imit/base >20	6 0 25 <1 16 4469 35 3 4431 4431 current 4	1 0 30 0 31 4047 40 <1 4143 history1 4	0 0 58 0 22 3368 56 0 4029 history2 2
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	50 5 37 12 3250 50 5 5750 i mit/base >20 >75	6 0 25 <1 16 4469 35 3 4431 <u>current</u> 4 3 <1 <u>current</u>	1 0 30 0 31 4047 40 <1 4143 history1 4 5	0 0 58 0 22 3368 56 0 4029 history2 2 1
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	50 5 37 12 3250 50 5 5750 imit/base >20 >75 >20	6 0 25 <1 16 4469 35 3 4431 current 4 3 <1	1 0 30 0 31 4047 40 <1 4143 history1 4 5 0	0 0 58 0 22 3368 56 0 4029 history2 2 1 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	50 5 37 12 3250 50 5 5750 imit/base >20 >75 >20	6 0 25 <1 16 4469 35 3 4431 <u>current</u> 4 3 <1 <u>current</u>	1 0 30 0 31 4047 40 <1 4143 history1 4 5 0 0 history1	0 0 58 0 22 3368 56 0 4029 history2 2 1 0 0 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	ASTM D5185m ASTM D5185m	50 5 37 12 3250 50 5 5750 Imit/base >20 >75 >20	6 0 25 <1 16 4469 35 3 4431 <i>current</i> 4 3 <1 <i>current</i> 0.9	1 0 30 0 31 4047 40 <1 4143 history1 4 5 0 0 history1 0.6	0 0 58 0 22 3368 56 0 4029 history2 2 1 0 history2 1.4
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	50 5 37 12 3250 50 5 5750 Imit/base >20 >75 >20 Imit/base	6 0 25 <1 16 4469 35 3 4431 <i>current</i> 4 3 <1 <i>current</i> 0.9 10.9	1 0 30 0 31 4047 40 <1 4143 history1 4 5 0 history1 0.6 10.7	0 0 58 0 22 3368 56 0 4029 history2 2 1 0 history2 1.4 10.3
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	50 5 37 12 3250 50 5 5750 imit/base >20 imit/base >20 imit/base	6 0 25 <1 16 4469 35 3 4431 <u>current</u> 4 3 <1 <u>current</u> 0.9 10.9 15.6	1 0 30 0 31 4047 40 <1 4143 history1 4 5 0 history1 0.6 10.7 15.4	0 0 58 0 22 3368 56 0 4029 history2 2 1 0 history2 1.4 10.3 17.8



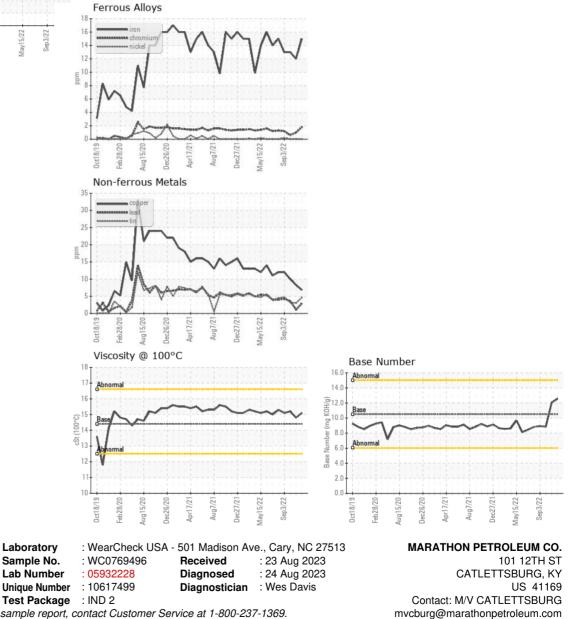
OIL ANALYSIS REPORT

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 PROPER	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	15.1	14.8	15.2
CRAPHS						





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)

Submitted By: M/V CATLETTSBURG

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