

OIL ANALYSIS REPORT

Sample Rating Trend



CATERPILLAR 12M 63

Component Diesel Engine Fluid PETRO CANADA 15W40 (--- 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	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0822237	WC0822401	
Sample Date		Client Info		22 Sep 2023	26 Jun 2023	
Machine Age	hrs	Client Info		14830	14565	
Oil Age	hrs	Client Info		265	310	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	NORMAL	
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	
Glycol		WC Method		NEG	NEG	
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	8	11	
Chromium	ppm	ASTM D5185m	>20	<1	<1	
Nickel	ppm	ASTM D5185m	>4	<1	<1	
Titanium	ppm	ASTM D5185m		<1	0	
Silver	ppm	ASTM D5185m	>3	0	0	
Aluminum	ppm	ASTM D5185m	>20	1	2	
Lead	ppm	ASTM D5185m	>40	0	0	
Copper	ppm	ASTM D5185m	>330	2	1	
Tin	ppm	ASTM D5185m	>15	<1	0	
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		<1	0	
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	Method ASTM D5185m	limit/base	current 4	history1 9	history2
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	4	9	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	4 3	9 <1	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	4 3 57	9 <1 68	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	4 3 57 <1	9 <1 68 0	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	4 3 57 <1 872	9 <1 68 0 1037	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	4 3 57 <1 872 1011	9 <1 68 0 1037 1211	
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	limit/base	4 3 57 <1 872 1011 946	9 <1 68 0 1037 1211 1146	
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	limit/base	4 3 57 <1 872 1011 946 1126	9 <1 68 0 1037 1211 1146 1348	
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		4 3 57 <1 872 1011 946 1126 2834	9 <1 68 0 1037 1211 1146 1348 3586	
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	limit/base	4 3 57 <1 872 1011 946 1126 2834 current	9 <1 68 0 1037 1211 1146 1348 3586 history1	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	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	limit/base >25	4 3 57 <1 872 1011 946 1126 2834 current 3	9 <1 68 0 1037 1211 1146 1348 3586 history1 3	 history2
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 ASTM D5185m ASTM D5185m	limit/base >25	4 3 57 <1 872 1011 946 1126 2834 current 3 2	9 <1 68 0 1037 1211 1146 1348 3586 history1 3 2	 history2
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	limit/base >25 >20	4 3 57 <1 872 1011 946 1126 2834 current 3 2 2 2	9 <1 68 0 1037 1211 1146 1348 3586 history1 3 2 2 2	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base	4 3 57 <1 872 1011 946 1126 2834 current 3 2 2 2 2	9 <1 68 0 1037 1211 1146 1348 3586 history1 3 2 2 2 history1	 history2 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 ASTM D5185m	limit/base >25 >20 limit/base >3 >20	4 3 57 <1 872 1011 946 1126 2834 current 3 2 2 2 2 current 0.2	9 <1 68 0 1037 1211 1146 1348 3586 history1 3 2 2 2 <u>history1</u> 0.2	 history2 history2
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	limit/base >25 >20 limit/base >3 >20	4 3 57 <1 872 1011 946 1126 2834 current 3 2 2 current 0.2 5.7	9 <1 68 0 1037 1211 1146 1348 3586 history1 3 2 2 2 history1 0.2 5.8	history2 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 ASTM D5185m	limit/base >25 >20 limit/base >3 >20 >30 >30	4 3 57 <1 872 1011 946 1126 2834 <u>current</u> 3 2 2 <u>current</u> 0.2 5.7 16.7	9 <1 68 0 1037 1211 1146 1348 3586 history1 3 2 2 history1 0.2 5.8 17.6	 history2 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	limit/base >25 >20 limit/base >3 >20 >30 >30	4 3 57 <1 872 1011 946 1126 2834 Current 3 2 2 Current 0.2 5.7 16.7 Current	9 <1 68 0 1037 1211 1146 1348 3586 history1 3 2 2 2 history1 0.2 5.8 17.6 history1	history2 history2 history2

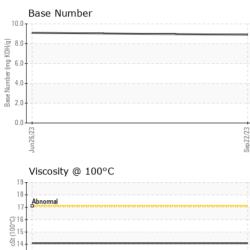


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OIL ANALYSIS REPORT

VISUAL



	100/			methou		130	Current	matory i	mstoryz
	White M	/letal	scalar	*Visual	NONE		NONE	NONE	
	Yellow I	Metal	scalar	*Visual	NONE		NONE	NONE	
	Precipit		scalar	*Visual	NONE		NONE	NONE	
	Silt		scalar	*Visual	NONE		NONE	NONE	
	Debris		scalar	*Visual	NONE		NONE	NONE	
	Sand/D	irt.			NONE		NONE	NONE	
	-		scalar	*Visual					
San 2.27.73	Appeara	ance	scalar	*Visual	NORML		NORML	NORML	
2	Cuci		scalar	*Visual	NORML		NORML	NORML	
		ied Water	scalar	*Visual	>0.2		NEG	NEG	
	Free Wa	ater	scalar	*Visual			NEG	NEG	
	FLUI	D PROPER	TIES	method	limit/ba	ise	current	history1	history2
	Visc @		cSt	ASTM D445			14.1	14.1	
	GRAF		001	Norm Dirio					
	Iron (Lead (ppm)		
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	Jun2				Sep2		Jun2		
	Alumi	inum (ppm)					Chromium (p	om)	
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	е ³⁰					e ³⁰			
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	Jun26/23				Sep 22/23		Jun26/23		
	Jun				Sep		Jun		
	Coppe	er (ppm)					Silicon (ppm)		
	400 Severe	*****				80	Severe		
	300-					60			
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	8200					d	Abnormal		
	100-					20-			
	0					0			
	Jun26/23				Sep 22/23		Jun26/23		
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l chorotory	10-010 10 10 10 10 10 10 10 10 10 10 10 10		501 Modi		Sep22/23		Jun26/23		
Laboratory Sample No	2000) 16 10 10 10 10 10 10 10 10 10 10 10 10 10	heck USA -		son Ave., Ca	ry, NC 27		Jun26/23 +	C.L. BENTO	
Sample No.	: WearCl : WC082	heck USA - 22237	Received	d :16	ry, NC 27		Jun26/23	70	6 38TH AVE
Sample No. Lab Number	: WearCl : WC082 : 059802	heck USA - 22237 232	Received Diagnos	d :16 ed :17	ry, NC 27 Oct 2023 Oct 2023		Jun26/23	70	6 38TH AVE _E BEACH, S
Sample No. Lab Number Unique Numbe	: WearCl : Wc082 : 059802 or : 106975	heck USA - 22237 232 527	Received Diagnose Diagnost	d :16 ed :17 tician :We	ry, NC 27		Jun26/23	70	6 38TH AVE E BEACH, 9 US 295
Sample No. Lab Number Unique Number tificate 12367 Test Package	: WearCl : Wc082 : 059802 er : 106975 e : MOB 1	heck USA - 22237 232 527 (Additional	Received Diagnose Diagnost Tests: TE	d : 16 ed : 17 tician : We BN)	ry, NC 27 Oct 2023 Oct 2023 s Davis		Jun26/23	70 MYRTI	N & SONS IN 6 38TH AVE LE BEACH, S US 295 Contact: NE @clbenton.cc
Sample No. Lab Number Unique Numbe	: WearCl : WearCl : WC082 : 059802 er : 106975 e : MOB 1 t, contact Cu t are outside	heck USA - 22237 232 527 (Additional <i>istomer Ser</i> 9 of the ISO	Received Diagnose Diagnose Tests: TE vice at 1-8 17025 sco	d : 16 (ed : 17 (tician : We BN) 800-237-1369 ope of accred	ry, NC 27 Oct 2023 Oct 2023 s Davis 9. <i>Ditation.</i>	7513		70 MYRTI neil(6 38TH AVE E BEACH, 9 US 295 Contact: NE

Contact/Location: NEIL ? - CLBMYR