

OIL ANALYSIS REPORT

Area [7503] 9620

Component **Diesel Engine**

DIESEL ENGINE OIL SAE 15W40 (--- GAL)

Sample Rating Trend



DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

Fluid Condition

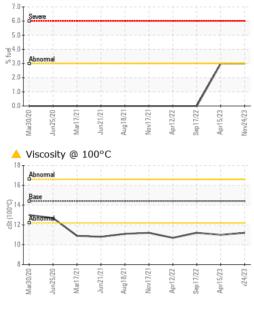
The oil is no longer serviceable due to the presence of contaminants.

Sample Date Client Info 24 Nov 2023 15 Apr 2023 17 Sep 2022 Machine Age kms Client Info 0 0 0 0 0 0 0 0 0	. Магдого Juni2020 Maržori Juni2021 Augžori Novi2021 Аргдогі Аргдогі Аргдогі Аргдогі Novi2023									
Sample Date Client Info 24 Nov 2023 15 Apr 2023 17 Sep 2022 Machine Age kms Client Info 137096 123269 84502 O O O O O O O O O	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2			
Machine Age kms Client Info 137096 123269 84502 Oil Age kms Client Info 0 0 0 0 Oil Changed Client Info Changed Not Changd Not Changd Sample Status method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >130 35 70 73 Chromium ppm ASTM D5185(m) >130 35 70 73 Chromium ppm ASTM D5185(m) >2 0 <1	Sample Number		Client Info		WC0853098	WC0796361	WC0702867			
Oil Age kms Client Info Changed Not Changed Northall	Sample Date		Client Info		24 Nov 2023	15 Apr 2023	17 Sep 2022			
Contamed Client Info Changed ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Mater WC Method NEG	Machine Age	kms	Client Info		137096	123269	84502			
ABNORMAL ABNORMAL	Oil Age	kms	Client Info		0	0	0			
CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >10 <1 <1 <1 Nickel ppm ASTM D5185(m) >4 <1 <1 <1 Nickel ppm ASTM D5185(m) >2 0 <1 <1 Silver ppm ASTM D5185(m) >2 0 <1 <1 Aluminum ppm ASTM D5185(m) >2 0 0 0 Aluminum ppm ASTM D5185(m) >2 0 0 0 Lead ppm ASTM D5185(m) >2 0 0 0 Copper ppm ASTM D5185(m) 0 0	Oil Changed		Client Info		Changed	Not Changd	Not Changd			
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >10 <1	Sample Status				ABNORMAL	ABNORMAL	NORMAL			
WEAR METALS	CONTAMINATION	J	method	limit/base	current	history1	history2			
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >130 35 70 73 Chromium ppm ASTM D5185(m) >10 <1 <1 <1 Nickel ppm ASTM D5185(m) >2 0 <1 <1 Silver ppm ASTM D5185(m) >2 0 0 0 Aluminum ppm ASTM D5185(m) >2 0 0 0 Aluminum ppm ASTM D5185(m) >2 0 0 0 Aluminum ppm ASTM D5185(m) >2 0 0 0 Lead ppm ASTM D5185(m) >2 0 0 0 Copper ppm ASTM D5185(m) >4 0 0 0 Vanadium ppm ASTM D5185(m) 0 <1 <1 <1 Vanadium ppm ASTM D5185(m) 0 0	Water		WC Method	>0.2	NEG	NEG	NEG			
Iron	Glycol		WC Method		NEG	NEG	NEG			
Chromium ppm ASTM D5185(m) >10 <1	WEAR METALS		method	limit/base	current	history1	history2			
Nickel	Iron	ppm	ASTM D5185(m)	>130	35	70	73			
Titanium	Chromium	ppm	ASTM D5185(m)	>10	<1	<1	<1			
Silver	Nickel	ppm	ASTM D5185(m)	>4	<1	<1	<1			
Aluminum ppm ASTM D5185(m) >20 8 9 6 Lead ppm ASTM D5185(m) >20 0 0 0 Copper ppm ASTM D5185(m) >125 1 2 3 Tin ppm ASTM D5185(m) >4 0 0 0 Antimony ppm ASTM D5185(m) 0 <1	Titanium	ppm	ASTM D5185(m)	>2	0	<1	<1			
Lead ppm ASTM D5185(m) >20 0 0 0 Copper ppm ASTM D5185(m) >12.5 1 2 3 Tin ppm ASTM D5185(m) >4 0 0 0 Antimony ppm ASTM D5185(m) 0 <1	Silver	ppm	ASTM D5185(m)	>2	0					
Copper ppm ASTM D5185(m) >125 1 2 3 Tin ppm ASTM D5185(m) >4 0 0 0 Antimony ppm ASTM D5185(m) 0 <1 <1 Vanadium ppm ASTM D5185(m) 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 250 46 40 34 Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphoru	Aluminum	ppm	ASTM D5185(m)	>20	8	9	6			
Tin ppm ASTM D5185(m) >4 0 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 10 0 0 0 Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 10 0 2 2 4 Manganese ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) 25 5 7 7 Sodium ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >20 6 7 7 7 Sodium ppm ASTM D5185(m) >20 6 7 7 7 Fuel % ASTM D5185(m) >20 6 7 7 7 Fuel % ASTM D5185(m) >20 6 7 7 7 Fuel history1 history2 Soot % % ASTM D7844* >6 0.6 0.9 0.7 Nitration Abs/cm ASTM D7644* >20 111.2 12.1 11.3	Lead	ppm	ASTM D5185(m)	>20	0	0	0			
Antimony ppm ASTM D5185(m) 0 <1	Copper	ppm	ASTM D5185(m)	>125	1	2	3			
Vanadium ppm ASTM D5185(m) 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 250 46 40 34 Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) <1	Tin	ppm	ASTM D5185(m)	>4	0	0	0			
Beryllium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 250 46 40 34 Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 100 2 2 4 Magnesium ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) >25 5	Antimony	ppm	ASTM D5185(m)			<1	<1			
Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 250 46 40 34 Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 0 <1 <1 <1 Magnesium ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) <1 <1 <1 <1 CONTAMINANTS method limit/base	Vanadium	ppm				0				
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 250 46 40 34 Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 100 2 2 4 Magnesium ppm ASTM D5185(m) 100 2 2 4 Magnesium ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m)<	Beryllium	ppm	ASTM D5185(m)		0	0				
Boron ppm ASTM D5185(m) 250 46 40 34 Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D51	Cadmium	ppm	ASTM D5185(m)		0	0	0			
Barium ppm ASTM D5185(m) 10 0 0 0 Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 100 2 2 4 Magnesium ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >20 6 7 7 Fuel % ASTM D7593*	ADDITIVES		method	limit/base	current	history1	history2			
Molybdenum ppm ASTM D5185(m) 100 2 2 4 Manganese ppm ASTM D5185(m) 0 <1	Boron	ppm	ASTM D5185(m)	250	46	40	34			
Manganese ppm ASTM D5185(m) 0 <1	Barium	ppm	ASTM D5185(m)	10	0	0	0			
Magnesium ppm ASTM D5185(m) 450 727 746 692 Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >158 3 3 3 <1.0 INFRA-RED method limit/base current history1 history2 Soot % %	Molybdenum	ppm	ASTM D5185(m)	100	2	2	4			
Calcium ppm ASTM D5185(m) 3000 1331 1429 1347 Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) 41 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >158 3 3 3 Potassium ppm ASTM D5185(m) >20 6 7 7 Fuel % ASTM D7593* >3.0 3 3 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7624*	Manganese	ppm	ASTM D5185(m)		0	<1	<1			
Phosphorus ppm ASTM D5185(m) 1150 709 757 739 Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) < 1	Magnesium	ppm	ASTM D5185(m)	450	727	746	692			
Zinc ppm ASTM D5185(m) 1350 770 798 763 Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) < 1	Calcium	ppm	ASTM D5185(m)	3000	1331	1429	1347			
Sulfur ppm ASTM D5185(m) 4250 2602 2566 2472 Lithium ppm ASTM D5185(m) <1	Phosphorus	ppm	ASTM D5185(m)	1150	709					
Lithium ppm ASTM D5185(m) <1	Zinc	ppm	ASTM D5185(m)	1350	770	798	763			
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >158 3 3 3 Potassium ppm ASTM D5185(m) >20 6 7 7 Fuel % ASTM D7593* >3.0 3 3 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0.6 0.9 0.7 Nitration Abs/cm ASTM D7624* >20 11.2 12.1 11.3		ppm	. ,	4250	2602		2472			
Silicon ppm ASTM D5185(m) >25 5 7 7 Sodium ppm ASTM D5185(m) >158 3 3 3 Potassium ppm ASTM D5185(m) >20 6 7 7 Fuel % ASTM D7593* >3.0 3 3 <1.0	Lithium	ppm	ASTM D5185(m)		<1	<1	<1			
Sodium ppm ASTM D5185(m) >158 3 3 3 Potassium ppm ASTM D5185(m) >20 6 7 7 Fuel % ASTM D7593* >3.0 3 3 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0.6 0.9 0.7 Nitration Abs/cm ASTM D7624* >20 11.2 12.1 11.3	CONTAMINANTS		method	limit/base	current	history1	history2			
Potassium ppm ASTM D5185(m) >20 6 7 7 Fuel % ASTM D7593* >3.0 3 3 <1.0	Silicon	ppm	ASTM D5185(m)	>25	5	7				
Fuel % ASTM D7593* >3.0 ▲ 3 3 <1.0	Sodium	ppm	ASTM D5185(m)	>158	3	3	3			
INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0.6 0.9 0.7 Nitration Abs/cm ASTM D7624* >20 11.2 12.1 11.3	Potassium	ppm	ASTM D5185(m)	>20	6	7	7			
Soot % % ASTM D7844* >6 0.6 0.9 0.7 Nitration Abs/cm ASTM D7624* >20 11.2 12.1 11.3	Fuel	%	ASTM D7593*	>3.0	<u>^</u> 3	▲ 3	<1.0			
Nitration Abs/cm ASTM D7624* >20 11.2 12.1 11.3	INFRA-RED		method	limit/base	current	history1	history2			
Nitration Abs/cm ASTM D7624* >20 11.2 12.1 11.3	Soot %	%	ASTM D7844*	>6	0.6	0.9	0.7			
	Nitration	Abs/cm	ASTM D7624*	>20			11.3			
	Sulfation	Abs/.1mm		>30						



Fuel Dilution

OIL ANALYSIS REPORT



FLUID DEGRADATION		method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	ASTM D7414*	>25	17.3	18.7	18.7	
VISUAL		method	limit/base	current	history1	history2	
White Metal	scalar	Visual*	NONE	VLITE			
Yellow Metal	scalar	Visual*	NONE	NONE			
Precipitate	scalar	Visual*	NONE	NONE			
Silt	scalar	Visual*	NONE	NONE			
Debris	scalar	Visual*	NONE	NONE			
Sand/Dirt	scalar	Visual*	NONE	NONE			
Appearance	scalar	Visual*	NORML	NORML			
Odor	scalar	Visual*	NORML	NORML	NORML	NORML	
Emulsified Water	scalar	Visual*	>0.2	NEG	NEG	NEG	
Free Water	scalar	Visual*		NEG	NEG	NEG	
FLUID PROPERT	FLUID PROPERTIES			current	history1	history2	

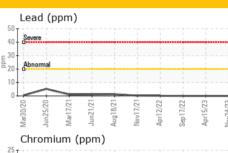
11.2

	GRAF	PHS							
250 T	Iron (ppm)							
150 - 100 -	Abnorma	1		1					
50 0	Mar30/20	Mar17/21	Jun21/21	Aug18/21	Nov17/21	Apr12/22	Sep17/22	Apr15/23	Nov24/23 1
	Alumi	_			Nov	Aprl	Sep1	Aprl	Nov2
30 -	Severe Abnorma			1	\				
10-					1	^		_	
	Mar30/20 -	Mar17/21	Jun21/21-	Aug18/21	Nov17/21-	Apr12/22 -	Sep17/22 -	Apr15/23 -	Nov24/23 -
100 T	Coppe	er (pp	m)						
	Severe								

cSt

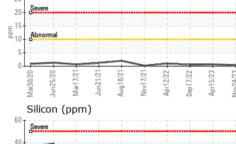
ASTM D7279(m) 14.4

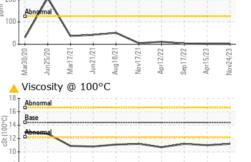
Visc @ 100°C

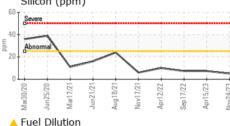


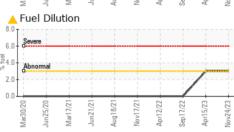
11.0

11.2











CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No. Lab Number Unique Number : 5708515

: WC0853098 : 02607429

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9

Recieved : 09 Jan 2024 Diagnosed : 10 Jan 2024

Diagnostician : Wes Davis

Test Package : MOB 1 (Additional Tests: FUELDILUTION, PercentFuel, Visual)

To discuss this sample report, contact Customer Service at 1-800-268-2131. Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab. Validity of results and interpretation are based on the sample and information as supplied.

7450 Torbram Rd. Mississauga, ON CA L4T 1G9 Contact: Serdar Okur sokur@rushtruckcentres.ca T: (905)671-7600

Rush Truck Centres