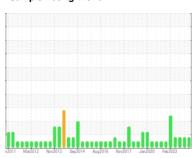


OIL ANALYSIS REPORT

Sample Rating Trend



FUEL



NOVA 60045

Component

Rear Diesel Engine

VALVOLINE 15W40 (22 LTR)

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.

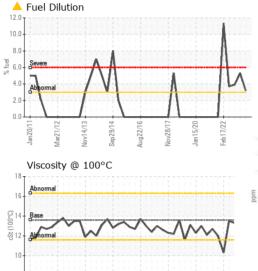
Fluid Condition

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

		n2011 Mar20	12 Nov2013 Sep2014	Aug2016 Nov2017 Jan2020	Feb 2022	
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0809129	WC0770740	WC0734884
Sample Date		Client Info		04 Oct 2023	06 Mar 2023	22 Sep 2022
Machine Age	kms	Client Info		960563	927834	903660
Oil Age	kms	Client Info		10000	10000	10000
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
CONTAMINATION	١	method	limit/base	current	history1	history2
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>75	19	17	20
Chromium	ppm	ASTM D5185(m)	>5	<1	<1	<1
Nickel	ppm	ASTM D5185(m)	>4	0	<1	0
Titanium	ppm	ASTM D5185(m)	>2	0	<1	<1
Silver	ppm	ASTM D5185(m)	>2	<1	0	0
Aluminum	ppm	ASTM D5185(m)	>15	2	3	2
Lead	ppm	ASTM D5185(m)	>25	<1	0	<1
Copper	ppm	ASTM D5185(m)	>100	1	<1	<1
Tin	ppm	ASTM D5185(m)	>4	0	<1	0
Antimony	ppm	ASTM D5185(m)		0	0	<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
	le le	71011W 20100(III)		•	U	
ADDITIVES	le le · · ·	method	limit/base	current	history1	history2
	ppm	. ,	limit/base	current 4		
ADDITIVES		method ASTM D5185(m)		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	39 1 49	current 4 0 62	history1	history2 2 0 62
ADDITIVES Boron Barium Molybdenum	ppm ppm	method ASTM D5185(m) ASTM D5185(m)	39 1 49	current 4 0	history1 4 0 61 <1	history2 2 0 62 <1
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	39 1 49 1 616	current 4 0 62 0 977	history1 4 0 61	history2 2 0 62 <1 996
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	39 1 49 1 616 1554	current 4 0 62 0 977 1065	history1 4 0 61 <1 1017 1156	history2 2 0 62 <1 996 1117
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899	current 4 0 62 0 977 1065 980	history1 4 0 61 <1 1017 1156 1125	history2 2 0 62 <1 996 1117 1080
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069	current 4 0 62 0 977 1065 980 1202	history1 4 0 61 <1 1017 1156 1125 1251	history2 2 0 62 <1 996 1117 1080 1227
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624	current 4 0 62 0 977 1065 980 1202 2398	history1 4 0 61 <1 1017 1156 1125 1251 2623	history2 2 0 62 <1 996 1117 1080 1227 2514
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624	current 4 0 62 0 977 1065 980 1202	history1 4 0 61 <1 1017 1156 1125 1251	history2 2 0 62 <1 996 1117 1080 1227
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624	current 4 0 62 0 977 1065 980 1202 2398	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8	history2 2 0 62 <1 996 1117 1080 1227 2514 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624	current 4 0 62 0 977 1065 980 1202 2398 <1 current	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2 4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624 limit/base >25	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5 10	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8 12	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2 4 12
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624 limit/base >25	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5 10 <1	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8 12 <1	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2 4 12 0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624 limit/base >25 >20 >3.0	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5 10 <1	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8 12 <1 △ 5.3	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2 4 12 0 3.9
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m)	39 1 49 1 616 1554 899 1069 2624 limit/base >25 >20 >3.0	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5 10 <1 ▲ 3.2 current	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8 12 <1 △ 5.3 history1	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2 4 12 0 ▲ 3.9 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D7593* method ASTM D7593*	39 1 49 1 616 1554 899 1069 2624 limit/base >25 >20 >3.0 limit/base >6	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5 10 <1 ▲ 3.2 current 0.5	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8 12 <1 ▲ 5.3 history1 0.4	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2 4 12 0 ▲ 3.9 history2 0.5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D7844* ASTM D7624*	39 1 49 1 616 1554 899 1069 2624 limit/base >25 >20 >3.0 limit/base >6 >20	current 4 0 62 0 977 1065 980 1202 2398 <1 current 5 10 <1 ▲ 3.2 current 0.5 10.9	history1 4 0 61 <1 1017 1156 1125 1251 2623 <1 history1 8 12 <1 △ 5.3 history1 0.4 11.5	history2 2 0 62 <1 996 1117 1080 1227 2514 <1 history2 4 12 0 ▲ 3.9 history2 0.5 11.8

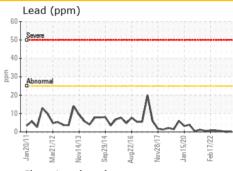


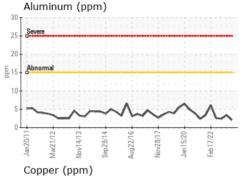
OIL ANALYSIS REPORT

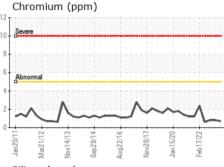


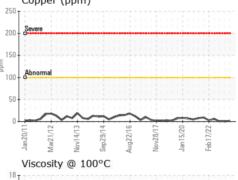
VISUAL		method	limit/base	current	history1	history2
Emulsified Water	scalar	Visual*	>0.2	NEG	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D7279(m)	13.6	13.1	13.3	13.3
GRAPHS						

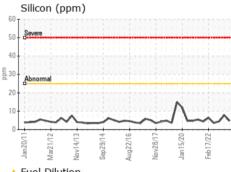
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Jan20/11	60	44-	69	Nov28/17	20	Feb17/22

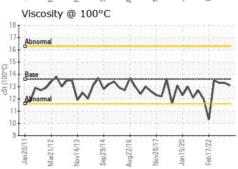


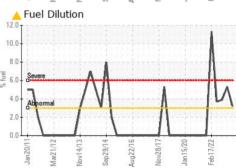














CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No. Lab Number **Unique Number**

: 5656971

: WC0809129 : 02587905

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

: 10 Oct 2023 Diagnosed : 11 Oct 2023

Diagnostician : Wes Davis

Test Package : MOB 1 (Additional Tests: PercentFuel)

CITY OF PETERBOROUGH 791 WEBBER AVENUE,, MUNICIPAL OPERATIONS CENTRE PETERBOROUGH, ON CA K9J 8N3

Contact: Frank Curran fcurran@peterborough.ca T: (705)742-7777 F: (705)743-3223

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.