

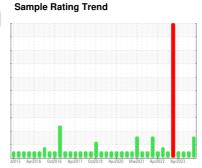
OIL ANALYSIS REPORT



NEW FLYER 1421

Component **Natural Gas Engine**

VALVOLINE PREMIUM BLUE 9200 15W40 (--- GAL)





DIAGNOSIS

Recommendation

We advise that you check for the source of water entry. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

There is a moderate concentration of water present in the oil. Test for glycol is negative.

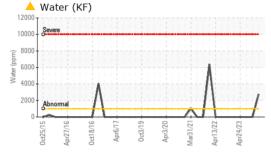
Fluid Condition

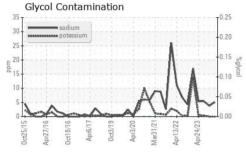
The oil is no longer serviceable due to the presence of contaminants.

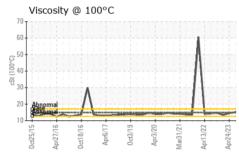
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0891082	WC0830289	WC0830061
Sample Date		Client Info		17 Jan 2024	12 Oct 2023	13 Jul 2023
Machine Age	kms	Client Info		596736	579162	0
Oil Age	kms	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				ABNORMAL	NORMAL	NORMAL
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>50	15	11	13
Chromium	ppm	ASTM D5185(m)	>4	<1	<1	<1
Nickel	ppm	ASTM D5185(m)	>2	<1	<1	<1
Titanium	ppm	ASTM D5185(m)		0	0	<1
Silver	ppm	ASTM D5185(m)	>3	0	0	0
Aluminum	ppm	ASTM D5185(m)	>9	2	2	2
Lead	ppm	ASTM D5185(m)	>30	- <1	2	2
Copper	ppm	ASTM D5185(m)		<1	<1	1
Tin	ppm	ASTM D5185(m)	>4	<1	0	<1
Antimony	ppm	ASTM D5185(m)		0	0	0
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	1-1-	method	limit/base	current	history1	history2
Boron	nnm	ASTM D5185(m)		9	14	6
Barium	ppm	ASTM D5185(m)		0	<1	0
Molybdenum	ppm	ASTM D5185(m)		61	59	55
	PPIII	AO 1101 DO 100(111)		01	55	55
		ACTM DE105/m)		0	0	-1
Manganese	ppm	ASTM D5185(m)		0	0	<1
Manganese Magnesium	ppm ppm	ASTM D5185(m)		940	920	885
Manganese Magnesium Calcium	ppm ppm	ASTM D5185(m) ASTM D5185(m)		940 1415	920 1388	885 1314
Manganese Magnesium Calcium Phosphorus	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		940 1415 790	920 1388 767	885 1314 726
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		940 1415 790 993	920 1388 767 986	885 1314 726 908
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		940 1415 790 993 2237	920 1388 767 986 2055	885 1314 726 908 1947
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		940 1415 790 993 2237 <1	920 1388 767 986 2055 <1	885 1314 726 908 1947 <1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method	limit/base	940 1415 790 993 2237 <1	920 1388 767 986 2055 <1	885 1314 726 908 1947 <1 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m)		940 1415 790 993 2237 <1 current	920 1388 767 986 2055 <1 history1	885 1314 726 908 1947 <1 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>+100	940 1415 790 993 2237 <1 current 5 5	920 1388 767 986 2055 <1 history1 5	885 1314 726 908 1947 <1 history2 7
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) METHOD METHOD ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>+100 >20	940 1415 790 993 2237 <1 current 5 5 0	920 1388 767 986 2055 <1 history1 5 4	885 1314 726 908 1947 <1 history2 7 5 <1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) METHOD ASTM D5185(m)	>+100 >20 >0.1	940 1415 790 993 2237 <1 current 5 0 0.273	920 1388 767 986 2055 <1 history1 5 4 0	885 1314 726 908 1947 <1 history2 7 5 <1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D6304* ASTM D6304*	>+100 >20	940 1415 790 993 2237 <1 current 5 5 0 0.273 2738	920 1388 767 986 2055 <1 history1 5 4 0	885 1314 726 908 1947 <1 history2 7 5 <1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) METHOD ASTM D5185(m)	>+100 >20 >0.1	940 1415 790 993 2237 <1 current 5 0 0.273	920 1388 767 986 2055 <1 history1 5 4 0	885 1314 726 908 1947 <1 history2 7 5 <1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D6304* ASTM D6304*	>+100 >20 >0.1	940 1415 790 993 2237 <1 current 5 5 0 0.273 2738	920 1388 767 986 2055 <1 history1 5 4 0	885 1314 726 908 1947 <1 history2 7 5 <1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) METHOD ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D6304* ASTM D6304* ASTM D7922*	>+100 >20 >0.1 >1000	940 1415 790 993 2237 <1 current 5 5 0 ▲ 0.273 ▲ 2738 0.0 current 0	920 1388 767 986 2055 <1 history1 5 4 0	885 1314 726 908 1947 <1 history2 7 5 <1
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) method ASTM D5185(m) ASTM D6304* ASTM D6304* ASTM D7922* method	>+100 >20 >0.1 >1000 limit/base	940 1415 790 993 2237 <1	920 1388 767 986 2055 <1 history1 5 4 0 history1	885 1314 726 908 1947 <1 history2 7 5 <1 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) METHOD ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D6304* ASTM D6304* ASTM D7922* METHOD ASTM D7844* ASTM D7824*	>+100 >20 >0.1 >1000 limit/base	940 1415 790 993 2237 <1 current 5 5 0 ▲ 0.273 ▲ 2738 0.0 current 0	920 1388 767 986 2055 <1 history1 5 4 0 history1 0	885 1314 726 908 1947 <1 history2 7 5 <1 history2 0
Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) METHOD ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D6304* ASTM D6304* ASTM D7922* METHOD ASTM D7824* ASTM D7624*	>+100 >20 >0.1 >1000 limit/base >20	940 1415 790 993 2237 <1 current 5 5 0 0.273 2738 0.0 current 0 14.3	920 1388 767 986 2055 <1 history1 5 4 0 history1 0 11.8	885 1314 726 908 1947 <1 history2 7 5 <1 history2 0 12.0



OIL ANALYSIS REPORT







VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE		
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*	>0.1	.2 %	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG
FLUID PROPER	ΓIES	method	limit/base	current	history1	history2

Visc @ 100°C cSt	ASTM D7279(m) 14.8	14.9 15.3	15.1
GRAPHS			
Iron (ppm) Severe 80 Abnormal 0018/18/18 0018/18/19 0018/18/18/19 0018/18/18/19 0018/18/18/18 0018/18/	Apr3/20 + Apr24/23 + A	Deta (ppm) Severe Oct 18/16 P Oct 18/16 P	Mar31/21 Apr13/22 Apr24/23
Aluminum (ppm)	7	Chromium (ppm)	N A A
20 15 Severe		Severe	
E 10 - Abnormal		Abnormal 2	M
Oct25/15 + Apr27/16 + Apr6/17 + Apr6/17 + Oct3/19 + Oct3	Apr3/20 Mar31/21 Apr13/22 Apr24/23	0ct25/15 - Apr27/16 - Oct18/16 - Apr6/17 - Oct3/19 - Oct3/19 - Apr3/20	Mar31/21- Apr13/22 - Apr24/23 -
Copper (ppm)		Silicon (ppm)	
400 - 300 - 200 - 100 - Severe		150 - Abnormal	~~_
U	Apr3/20	0ct25/15 + Apr27/16 - Oct18/16 - Apr6/17 + Apr3/20 - Apr	Mar31/21 Apr13/22 Apr24/23

Water

0.96

0.00



CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No. Lab Number Unique Number : 5711274

: WC0891082 : 02610188

60

(100°C) (200°C) (200°C

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

Viscosity @ 100°C

Recieved : 22 Jan 2024 Diagnosed : 23 Jan 2024 Diagnostician : Kevin Marson

Test Package: MOB 1 (Additional Tests: Glycol, KF, Visual)

CITY OF HAMILTON 2200 UPPER JAMES,, MOUNTAIN TRANSIT STOREROOM MOUNT HOPE, ON

CA LOR 1W0 Contact: Jeff Parr jeff.parr@hamilton.ca T: (905)546-2424

F: (905)679-4502

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.

Contact/Location: Jeff Parr - HAMHAM