

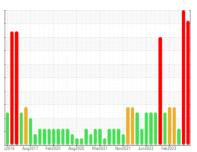
OIL ANALYSIS REPORT



NEW FLYER 0807

Component **Diesel Engine**

SAFETY-KLEEN PERFORMANCE PLUS XHD-7 15W40 (--- GAL)



Sample Rating Trend



DIAGNOSIS

Recommendation

We advise that you check for the source of the coolant leak. We recommend that you drain the oil from the component if this has not already been done. We advise that you flush the component thoroughly before re-filling with oil. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Test for glycol is positive. There is a moderate amount of fuel present in the oil. There is a high concentration of glycol present in the oil. Tests confirm the presence of fuel in the oil.

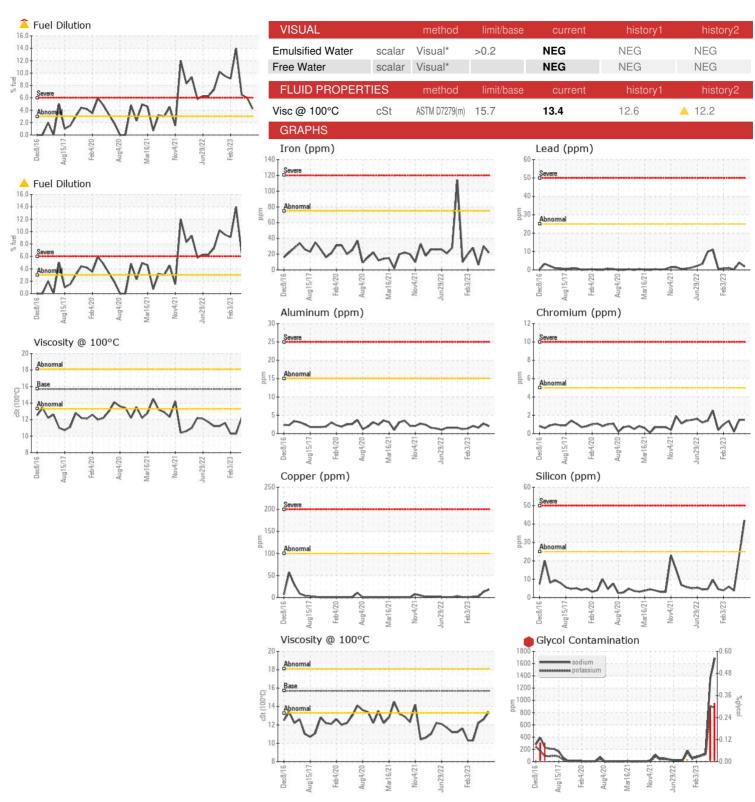
Fluid Condition

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

Sample Number Client Info WC0830191 WC0811399 WC08114 Sample Date Client Info 04 Aug 2023 26 Jun 2023 10 May 20 Machine Age kms Client Info 0	E PLUS XHD-7 15W40	(GAL)	c2016 Aug20	117 Feb2020 Aug2020	Mar2021 Nov2021 Jun2022	Feb 2023	
Sample Date Client Info O4 Aug 2023 26 Jun 2023 10 May 20 Machine Age kms Client Info O	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age kms Client Info 0 186306 176272 Oil Age kms Client Info 0 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status SEVERE SEVERE SEVERE ABNORM WEAR METALS method limit/base current history1 history1 Iron ppm ASTM DS188(m) >75 22 30 6 Chromium ppm ASTM DS188(m) >4 0 0 <1	Sample Number		Client Info		WC0830191	WC0811399	WC0811427
Oil Age kms Client Info N/A			Client Info		04 Aug 2023	26 Jun 2023	10 May 2023
Client Info	•	kms	Client Info		_	186306	176272
SEVERE SEVERE ABNORM WEAR METALS method limit/base current history1 histor history1 histor history1 histo	Oil Age	kms	Client Info		0	0	0
WEAR METALS	Oil Changed		Client Info		N/A	N/A	N/A
Irron	Sample Status				SEVERE	SEVERE	ABNORMAL
Chromium ppm ASTM D5185(m) >5 2 2 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185(m)	>75	22	30	6
Titanium	Chromium	ppm	ASTM D5185(m)	>5	2	2	<1
Silver ppm ASTM D5185(m) >2 0 ▲ 2 0 Aluminum ppm ASTM D5185(m) >15 2 3 2 Lead ppm ASTM D5185(m) >25 2 4 <1 Copper ppm ASTM D5185(m) >100 18 13 2 Tin ppm ASTM D5185(m) 0 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 53 32 4 4 Boron ppm ASTM D5185(m) 53 32 4 4 Barium ppm ASTM D5185(m) 0 0 0 0 Manganese ppm ASTM D5185(m) 225 242 <th< td=""><td>Nickel</td><td>ppm</td><td>ASTM D5185(m)</td><td>>4</td><th>0</th><td>0</td><td><1</td></th<>	Nickel	ppm	ASTM D5185(m)	>4	0	0	<1
Aluminum	Titanium	ppm	ASTM D5185(m)	>2	<1	<1	0
Lead ppm ASTM D5185(m) >25 2 4 <1 Copper ppm ASTM D5185(m) >100 18 13 2 Tin ppm ASTM D5185(m) >4 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 <1	Silver	ppm	ASTM D5185(m)	>2	0	<u>^</u> 2	0
Copper ppm ASTM D5185(m) >100 18 13 2 Tin ppm ASTM D5185(m) >4 0 0 0 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 Cadmium ppm ASTM D5185(m) 53 32 4 Barium ppm ASTM D5185(m) 0 0 0 Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) 41 <1	Aluminum	ppm	ASTM D5185(m)	>15	2	3	2
Copper ppm ASTM D5185(m) >100 18 13 2 Tin ppm ASTM D5185(m) >4 0 0 0 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 Cadmium ppm ASTM D5185(m) 53 32 4 Boron ppm ASTM D5185(m) 0 0 0 Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) 342 831 901 Calcium ppm ASTM D5185(m) 342 831 901 Calcium ppm ASTM D5185(m) 383 893 1014 Phosphorus ppm ASTM D5185(m) 1013 1017	Lead		ASTM D5185(m)	>25	2	4	<1
Tin ppm ASTM D5185(m) >-4 0 0 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 0 ADDITIVES method limit/base current history1 history Boron ppm ASTM D5185(m) 53 32 4 Barium ppm ASTM D5185(m) 0 0 0 0 Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) 21 <1 <1 <1 <1 <1 <1 Manganesium ppm ASTM D5185(m) 842 831 901 Calcium ppm ASTM D5185(m) 883 893 1014 Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Copper		ASTM D5185(m)	>100	18	13	2
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 ADDITIVES method limit/base current history1 histor Boron ppm ASTM D5185(m) 53 32 4 Barium ppm ASTM D5185(m) 0 0 0 Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) 21 <1	Tin		ASTM D5185(m)	>4	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 method limit/base current history1 history1 Boron ppm ASTM D5185(m) 53 32 4 Barium ppm ASTM D5185(m) 0 0 0 Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) 21 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Antimony		ASTM D5185(m)		0	0	<1
Beryllium	•		ASTM D5185(m)		0	0	0
Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185(m) 53 32 4 Barium ppm ASTM D5185(m) 0 0 0 Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) 842 831 901 Calcium ppm ASTM D5185(m) 883 893 1014 Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1	Bervllium		. ,				
Boron	•		()				
Barium ppm ASTM D5185(m) 0 0 0 Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) 342 831 901 Calcium ppm ASTM D5185(m) 883 893 1014 Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >20 888 899 116 Fuel % <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185(m) 225 242 71 Manganese ppm ASTM D5185(m) <1 <1 <1 Magnesium ppm ASTM D5185(m) 842 831 901 Calcium ppm ASTM D5185(m) 883 893 1014 Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >20 888 A 899 116 Fuel % ASTM D7593* >3.0 4.2 6 6.5 Glycol %	Boron	ppm	ASTM D5185(m)		53	32	4
Manganese ppm ASTM D5185(m) <1 <1 <1 Magnesium ppm ASTM D5185(m) 842 831 901 Calcium ppm ASTM D5185(m) 883 893 1014 Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 2397 2407 2608 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1	Barium	ppm	ASTM D5185(m)		0	0	0
Magnesium ppm ASTM D5185(m) 842 831 901 Calcium ppm ASTM D5185(m) 883 893 1014 Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1	Molybdenum	ppm	ASTM D5185(m)		225	242	71
Calcium ppm ASTM D5185(m) 883 893 1014 Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1	Manganese	ppm	ASTM D5185(m)		<1	<1	<1
Phosphorus ppm ASTM D5185(m) 1279 1295 1069 Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >20 888 899 116 Fuel % ASTM D7593* >3.0 4.2 6 6.5 Glycol % ASTM D7922* 0.318 0.29 0.0 INFRA-RED method limit/base current history1 history1 Soot % % ASTM D7844* >6 0.3 0.2 0.1	Magnesium	ppm	ASTM D5185(m)		842	831	901
Zinc ppm ASTM D5185(m) 1013 1017 1136 Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >20 888 899 116 Fuel % ASTM D7593* >3.0 4.2 6 6.5 Glycol % ASTM D7922* 0.318 0.29 0.0 INFRA-RED method limit/base current history1 histor Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9	Calcium	ppm	ASTM D5185(m)		883	893	1014
Sulfur ppm ASTM D5185(m) 2397 2407 2608 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >20 4888 4899 116 Fuel % ASTM D7593* >3.0 4.2 6 6.5 Glycol % ASTM D7922* 0.318 0.29 0.0 INFRA-RED method limit/base current history1 history Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6	Phosphorus	ppm	ASTM D5185(m)		1279	1295	1069
CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >20 4 4 1360 139 Potassium ppm ASTM D5185(m) >20 4888 4899 116 Fuel % ASTM D7593* >3.0 4.2 6 6.5 Glycol % ASTM D7922* 0.318 0.29 0.0 INFRA-RED method limit/base current history1 history Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Zinc	ppm	ASTM D5185(m)		1013	1017	1136
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) >20 4888 4899 116 Fuel % ASTM D7593* >3.0 4.2 6 6.5 Glycol % ASTM D7922* 0.318 0.29 0.0 INFRA-RED method limit/base current history1 history Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Sulfur	ppm	ASTM D5185(m)		2397	2407	2608
Silicon ppm ASTM D5185(m) >25 42 23 4 Sodium ppm ASTM D5185(m) △ 1691 △ 1360 139 Potassium ppm ASTM D5185(m) >20 A888 △ 899 116 Fuel % ASTM D7593* >3.0 △ 4.2 ♠ 6 △ 6.5 Glycol % ASTM D7922* ♠ 0.318 ♠ 0.29 0.0 INFRA-RED method limit/base current history1 history Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium ppm ASTM D5185(m) ▲ 1691 ▲ 1360 139 Potassium ppm ASTM D5185(m) >20 ♣ 888 ♣ 899 116 Fuel % ASTM D7593* >3.0 ♣ 4.2 ♠ 6 ♠ 6.5 Glycol % ASTM D7922* ♠ 0.318 ♠ 0.29 0.0 INFRA-RED method limit/base current history1 history Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185(m) >20 A888 A899 116 Fuel % ASTM D7593* >3.0 4.2 6 △ 6.5 Glycol % ASTM D7922* ● 0.318 ● 0.29 0.0 INFRA-RED method limit/base current history1 history Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Silicon	ppm	ASTM D5185(m)	>25	42	23	4
Fuel % ASTM D7593* >3.0 ▲ 4.2 ● 6 ▲ 6.5 Glycol % ASTM D7922* ● 0.318 ● 0.29 0.0 INFRA-RED method limit/base current history1 history1 Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Sodium	ppm	ASTM D5185(m)		1691	△ 1360	139
Glycol % ASTM D7922* ● 0.318 ● 0.29 0.0 INFRA-RED method limit/base current history1 history Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Potassium	ppm	ASTM D5185(m)	>20	888	<u> </u>	116
INFRA-RED method limit/base current history1 history1 Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Fuel	%	ASTM D7593*	>3.0	4.2	• 6	△ 6.5
Soot % % ASTM D7844* >6 0.3 0.2 0.1 Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Glycol	%	ASTM D7922*		0.318	0.29	0.0
Nitration Abs/cm ASTM D7624* >20 10.8 10.0 6.9 Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4	Soot %	%	ASTM D7844*	>6	0.3	0.2	0.1
Sulfation Abs/.1mm ASTM D7415* >30 25.0 23.6 20.4							
FLUID DEGRADATION method limit/base current history1 history							
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Oxidation Abs/.1mm ASTM D7414* >25 17.8 19.2 17.0	Oxidation	Abs/.1mm	ASTM D7414*	>25	17.8	19.2	17.0



OIL ANALYSIS REPORT





CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No. Lab Number Unique Number

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 : WC0830191

Received : 02575604

Diagnosed : 5620655

: 14 Aug 2023 : 15 Aug 2023

Diagnostician : Kevin Marson Test Package : MOB 1 (Additional Tests: PercentFuel)

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.

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