

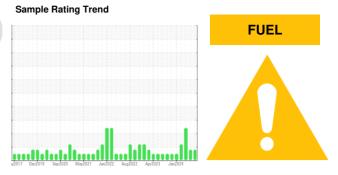
# **OIL ANALYSIS REPORT**



Machine Id **NEW FLYER 1213** 

Diesel Engine

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



## **DIAGNOSIS**

#### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

### Contamination

Light fuel dilution occurring. No other contaminants were detected in the oil.

#### **Fluid Condition**

The condition of the oil is acceptable for the time in service.

Sample Number   Client Info   WC0937189   WC0937376   WC0917546   Sample Date   Client Info   09 Jul 2024   09 May 2024   28 Mar 2024   Machine Age   kms   Client Info   0   0   0   0   0   0   0   0   0							
Sample Date	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age   kms	Sample Number		Client Info			WC0937376	WC0917546
Oil Age	Sample Date		Client Info		09 Jul 2024	09 May 2024	28 Mar 2024
Client Info	Machine Age	kms	Client Info		873591	858856	848815
MARGINAL   ABNORMAL   SEVERE	Oil Age	kms	Client Info		0	0	0
CONTAMINATION	Oil Changed		Client Info		N/A	Changed	N/A
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >75         25         13         10           Chromium         ppm         ASTM D5185(m)         >5         <1         <1         <1           Nickel         ppm         ASTM D5185(m)         >4         <1         0         0           Sliver         ppm         ASTM D5185(m)         >2         0         0         0           Sliver         ppm         ASTM D5185(m)         >2         0         0         0           Aluminum         ppm         ASTM D5185(m)         >2         0         0         0           Lead         ppm         ASTM D5185(m)         >2         5         <1         <1         <1           Lead         ppm         ASTM D5185(m)         >2         5         <1         <1         <1           Copper         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)	Sample Status				MARGINAL	ABNORMAL	SEVERE
WEAR METALS	CONTAMINATION	J	method	limit/base	current	history1	history2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Description   Description	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185(m)         >5         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185(m)	>75	25	13	10
Titanium         ppm         ASTM D5185(m)         >2         0         0         0           Silver         ppm         ASTM D5185(m)         >2         0         0         0           Aluminum         ppm         ASTM D5185(m)         >2         0         0         0           ALead         ppm         ASTM D5185(m)         >10         2         1         1           Copper         ppm         ASTM D5185(m)         >100         <1         <1         <1           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           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Barium         ppm         ASTM D5185(m)         0         0         0 </td <td>Chromium</td> <td>ppm</td> <td>ASTM D5185(m)</td> <td>&gt;5</td> <th>&lt;1</th> <td>&lt;1</td> <td>&lt;1</td>	Chromium	ppm	ASTM D5185(m)	>5	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185(m)	>4	<1	0	0
Aluminum ppm ASTM D5185(m) >15 2 1 1 1  Lead ppm ASTM D5185(m) >25 5 <1 <1 <1  Copper ppm ASTM D5185(m) >20 0 0 0  Antimony ppm ASTM D5185(m) >4 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) 0 0 0 0  Cadmium ppm ASTM D5185(m) 0 0 0 0 0  ADDITIVES method limit/base current history1 history2  Boron ppm ASTM D5185(m) 0 0 0 0  Barium ppm ASTM D5185(m) 0 0 0 0  Manganese ppm ASTM D5185(m) 0 0 0 0  Manganesium ppm ASTM D5185(m) 0 0 0 0  Manganesium ppm ASTM D5185(m) 0 0 0 0  Manganesium ppm ASTM D5185(m) 954 930 906  Calcium ppm ASTM D5185(m) 954 930 906  Calcium ppm ASTM D5185(m) 965 940 924  Zinc ppm ASTM D5185(m) 965 940 924  Zinc ppm ASTM D5185(m) 1219 1164 1101  Sulfur ppm ASTM D5185(m) 2416 2384 2313  Lithium ppm ASTM D5185(m) 2416 2384 2313  Lithium ppm ASTM D5185(m) 2416 2384 2313  CONTAMINANTS method limit/base current history1 history2  Solicon ppm ASTM D5185(m) 20 4 2 1  CONTAMINANTS method limit/base current history1 history2  Solicon ppm ASTM D5185(m) 20 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Titanium	ppm	ASTM D5185(m)	>2	0	0	0
Lead         ppm         ASTM D5188(m)         >25         5         <1         <1           Copper         ppm         ASTM D5185(m)         >100         <1         <1         <1           Tin         ppm         ASTM D5185(m)         >4         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)         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0         0         0           Barium         ppm         ASTM D5185(m)         954         930         906	Silver	ppm	ASTM D5185(m)	>2	0	0	0
Copper         ppm         ASTM D5185(m)         >100         <1         <1         <1           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           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0         0           Barium         ppm         ASTM D5185(m)         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         57         54           Manganese         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164 <td>Aluminum</td> <td>ppm</td> <td>ASTM D5185(m)</td> <td>&gt;15</td> <th>2</th> <td>1</td> <td>1</td>	Aluminum	ppm	ASTM D5185(m)	>15	2	1	1
Tin	Lead	ppm	ASTM D5185(m)	>25	5	<1	<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         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0         0         0           Barium         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         57         54           Manganese         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         >25	Copper	ppm	ASTM D5185(m)	>100	<1	<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)         0         0         0         0           Barium         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         57         54           Manganese         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1           CONTAMINANTS         method         limit/base	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)         1         <1         <1         <1           Barium         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         57         54           Manganese         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         1031         988         943           Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         >25         4         2         1           CONTAMINANTS         method         limit	Antimony	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)         1         <1	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium         ppm         ASTM D5185(m)         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         57         54           Manganese         ppm         ASTM D5185(m)         -1         0         0           Magnesium         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         1031         988         943           Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         >25         4         2         1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1         <1           Fuel         %         ASTM D	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         60         57         54           Manganese         ppm         ASTM D5185(m)         <1         0         0           Magnesium         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         1031         988         943           Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1         <1           Fuel         %         ASTM D7593*         >3.0         2         3.1         6.1           INFRA-RED         method	Boron	ppm	ASTM D5185(m)		1	<1	<1
Manganese         ppm         ASTM D5185(m)         <1         0         0           Magnesium         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         1031         988         943           Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Sodium         ppm         ASTM D5185(m)         >20         4         <1         <1           Fuel         %         ASTM D7693*         >3.0         2         3.1         6.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %	Barium	ppm	ASTM D5185(m)		0	0	0
Magnesium         ppm         ASTM D5185(m)         954         930         906           Calcium         ppm         ASTM D5185(m)         1031         988         943           Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Sodium         ppm         ASTM D5185(m)         >20         4         2         1           Fuel         %         ASTM D7593*         >3.0         2         3.1         6.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7644*         >6         1         0.6         0.6           Nitration	Molybdenum	ppm	ASTM D5185(m)		60	57	54
Calcium         ppm         ASTM D5185(m)         1031         988         943           Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1	Manganese	ppm	ASTM D5185(m)		<1	0	0
Calcium         ppm         ASTM D5185(m)         1031         988         943           Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1	Magnesium	ppm	ASTM D5185(m)		954	930	906
Phosphorus         ppm         ASTM D5185(m)         965         940         924           Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Sodium         ppm         ASTM D5185(m)         >20         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1	Calcium		ASTM D5185(m)		1031	988	943
Zinc         ppm         ASTM D5185(m)         1219         1164         1101           Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Sodium         ppm         ASTM D5185(m)         >20         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1         <1           Fuel         %         ASTM D7593*         >3.0         2         3.1         6.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >6         1         0.6         0.6           Nitration         Abs/cm         ASTM D7624*         >20         10.0         8.8         8.8	Phosphorus		\ /		965	940	924
Sulfur         ppm         ASTM D5185(m)         2416         2384         2313           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Sodium         ppm         ASTM D5185(m)         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1	Zinc		ASTM D5185(m)		1219	1164	1101
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Sodium         ppm         ASTM D5185(m)         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1	Sulfur				2416	2384	2313
Silicon         ppm         ASTM D5185(m)         >25         4         2         1           Sodium         ppm         ASTM D5185(m)         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1	Lithium		. ,		<1	<1	<1
Sodium         ppm         ASTM D5185(m)         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1         <1           Fuel         %         ASTM D7593*         >3.0         2         ▲ 3.1         ▲ 6.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >6         1         0.6         0.6           Nitration         Abs/cm         ASTM D7624*         >20         10.0         8.8         8.8	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium         ppm         ASTM D5185(m)         4         2         1           Potassium         ppm         ASTM D5185(m)         >20         4         <1	Silicon	ppm	ASTM D5185(m)	>25	4	2	1
Fuel       %       ASTM D7593*       >3.0       ▲ 2       ▲ 3.1       ▲ 6.1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       ASTM D7844*       >6       1       0.6       0.6         Nitration       Abs/cm       ASTM D7624*       >20       10.0       8.8       8.8	Sodium	ppm	ASTM D5185(m)		4	2	1
Fuel         %         ASTM D7593*         >3.0         ▲ 2         ▲ 3.1         ▲ 6.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >6         1         0.6         0.6           Nitration         Abs/cm         ASTM D7624*         >20         10.0         8.8         8.8	Potassium		ASTM D5185(m)	>20	4	<1	<1
Soot %         %         ASTM D7844*         >6         1         0.6         0.6           Nitration         Abs/cm         ASTM D7624*         >20         10.0         8.8         8.8	Fuel		. ,		<u>^</u> 2	▲ 3.1	<b>▲</b> 6.1
Nitration         Abs/cm         ASTM D7624*         >20         10.0         8.8         8.8	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         ASTM D7624*         >20         10.0         8.8         8.8	Soot %	%	ASTM D7844*	>6	1	0.6	0.6
	Nitration						
	Sulfation						



## **OIL ANALYSIS REPORT**







Laboratory Sample No.

Lab Number : 02647275 Unique Number : 5812827

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 : WC0937189

Received **Tested** Diagnosed Test Package : MOB 1 ( Additional Tests: PercentFuel )

: 11 Jul 2024 : 12 Jul 2024

: 12 Jul 2024 - Wes Davis

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

**CITY OF HAMILTON** 

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.