

### **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL

# FIRE PUMP 1 (S/N 12212)

Diesel Engine Fluid VALVOLINE 15W40 (4 GAL)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

#### Fluid Condition

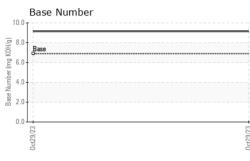
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

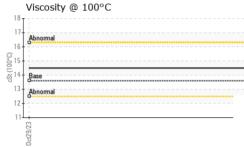
				Oct2023		
SAMPLE INFORM	<b>IATION</b>	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0864161		
Sample Date		Client Info		29 Oct 2023		
Machine Age	hrs	Client Info		0		
Oil Age	hrs	Client Info		0		
Oil Changed		Client Info		N/A		
Sample Status				NORMAL		
CONTAMINATIO	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0		
Glycol		WC Method		NEG		
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	0		
Chromium	ppm	ASTM D5185m	>20	0		
Nickel	ppm	ASTM D5185m	>4	0		
Titanium	ppm	ASTM D5185m		0		
Silver	ppm	ASTM D5185m	>3	0		
Aluminum	ppm	ASTM D5185m	>20	1		
Lead	ppm	ASTM D5185m	>40	0		
Copper	ppm	ASTM D5185m	>330	0		
Tin	ppm	ASTM D5185m	>15	0		
Vanadium	ppm	ASTM D5185m		0		
Cadmium	ppm	ASTM D5185m		0		
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 39	current 107	history1	history2
	ppm ppm					
Boron		ASTM D5185m	39	107		
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m	39 1	107 0		
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49	107 0 77		
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1	107 0 77 0		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616	107 0 77 0 18 2058 960		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069	107 0 77 0 18 2058	  	  
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899	107 0 77 0 18 2058 960	   	   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069	107 0 77 0 18 2058 960 1251		    
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b>	107 0 77 0 18 2058 960 1251 4173		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25	107 0 77 0 18 2058 960 1251 4173 current 7 <1	     history1	     history2
Boron Barium Molybdenum Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25	107 0 77 0 18 2058 960 1251 4173 current 7	     history1	    history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25	107 0 77 0 18 2058 960 1251 4173 current 7 <1	     history1	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25	107 0 77 0 18 2058 960 1251 4173 current 7 <1 2	     history1  	     history2  
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25 >20 <b>limit/base</b>	107 0 77 0 18 2058 960 1251 4173 current 7 <1 2 2	     history1   history1	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <i>limit/base</i> >25 >20 <i>limit/base</i> >3	107 0 77 0 18 2058 960 1251 4173 <u>current</u> 7 <1 2 <u>current</u> 0.1	     history1   history1 	     history2  history2  history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25 20 <b>limit/base</b> >3 >20	107 0 77 0 18 2058 960 1251 4173 <i>current</i> 7 <1 2 <i>current</i> 0.1 7.5	     history1  history1  history1	history2 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25 <b>limit/base</b> >20 <b>limit/base</b> >3 >20	107 0 77 0 18 2058 960 1251 4173 <u>current</u> 7 <1 2 <u>current</u> 0.1 7.5 17.6		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	39 1 49 1 616 1554 899 1069 2624 <b>limit/base</b> >25 <b>limit/base</b> >3 >20 <b>limit/base</b> >3 >20	107 0 77 0 18 2058 960 1251 4173 <i>current</i> 7 <1 2 <i>current</i> 0.1 7.5 17.6	      history1  history1  history1	



## **OIL ANALYSIS REPORT**

VISUAL





	VISUAL		memou	iiiiii/base	Guirein	mistory i	Thistory Z
	White Metal	scalar	*Visual	NONE	NONE		
	Yellow Metal	scalar	*Visual	NONE	NONE		
	Precipitate	scalar	*Visual	NONE	NONE		
	Silt		*Visual	NONE	NONE		
	Debris	scalar	*Visual	NONE	NONE		
	Sand/Dirt	scalar	*Visual	NONE	NONE		
23	Appearance	scalar	*Visual	NORML	NORML		
0ct29/23	Odor	scalar	*Visual	NORML	NORML		
	Emulsified Water	scalar	*Visual	>0.2	NEG		
	Free Water		*Visual	20.2	NEG		
		scalar	VISUAI		NEG		
	FLUID PROPER	TIES	method	limit/base	e current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	13.6	14.5		
	GRAPHS						
	Ferrous Alloys						
	iron						
	8 - chromium						
	mdd						
	4						
	2						
	0						
	9/23			9/23			
	0ct29/23			0ct29/23			
	Non-ferrous Meta	ls					
	<sup>10</sup> T						
	copper						
	8 management tin						
	6						
	ш dd						
	4						
	2						
	0						
	0ct29/23			0ct29/23			
	Oct			Oct			
	Viscosity @ 100°C	2			Base Number		
	<sup>18</sup>			1	0.0 <sub>T</sub>		
	17- Abnormal						
	Abnormal 16			(B/H	8.0 Base		
	£ 15			Base Number (mg KOH/g)	6.0		
	5-00 -00 -015 -015 -015 -00 -015 -015 -0			ier (m			
	-			Mumb	4.0		
	13 - Abnormal			ase			
	12-				2.0-		
	11				0.0		
	0ct29/23			0ct29/23	0ct29/23		
	0ct2			0ct2	0ct2		
atory	WearCheck USA	501 Madie		ry NC 275	13		WESTON/PD
atory le No.	: WearCheck USA - ! : WC0864161				13	LAMB	
atory le No. umber	: WC0864161	Received	: 02	ry, NC 275 Nov 2023 Nov 2023	13		PO BOX 5
le No.	: WC0864161 : 05996880		d : 02	Nov 2023	13		WESTON/RD PO BOX 55 K RAPIDS, M US 5647

Report Id: LAMPAR [WUSCAR] 05996880 (Generated: 11/03/2023 14:04:26) Rev: 1

To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Certificate L2367

ō

Contact/Location: MICHAEL GRUIS - LAMPAR

michael.gruis@lambweston.com

T: (218)732-2188

F: (218)732-2175