

# **OIL ANALYSIS REPORT**

## Sample Rating Trend

NORMAL



# DIGGER DERRICK Machine Id FREIGHTLINER V033

Component

**Diesel Engine** 

HIGH PERFORMANCE LUBRICANTS HDMO 15W40 (12 QTS)

# DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil

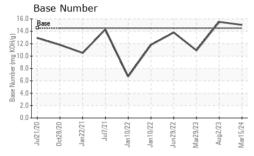
### **Fluid Condition**

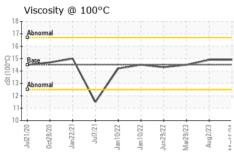
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		HPL0002277	HPL0001783	HPL0000642
Sample Date		Client Info		15 Mar 2024	02 Aug 2023	29 Mar 2023
Machine Age	hrs	Client Info		7956	7449	7215
Oil Age	hrs	Client Info		750	243	865
Oil Changed		Client Info		Not Changd	Not Changd	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATIO	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>80	80	37	75
Chromium	ppm	ASTM D5185m	>5	<1	<1	1
Nickel	ppm	ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m		6	4	5
Lead	ppm		>30	0	0	0
Copper	ppm	ASTM D5185m		2	2	2
Tin	ppm		>5	0	0	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current	history1 180	history2 153
	ppm					
Boron	ppm	ASTM D5185m		125	180	153
Boron Barium		ASTM D5185m ASTM D5185m	200	125 <1	180	153 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	200	125 <1 730	180 2 702	153 0 754
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	200 85	125 <1 730 <1	180 2 702 <1	153 0 754 1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	200 85 525	125 <1 730 <1 527	180 2 702 <1 468	153 0 754 1 472
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	200 85 525 4300	125 <1 730 <1 527 4418	180 2 702 <1 468 3901	153 0 754 1 472 4123
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	200 85 525 4300 1000	125 <1 730 <1 527 4418 958	180 2 702 <1 468 3901 821	153 0 754 1 472 4123 867
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 ASTM D5185m	200 85 525 4300 1000 1100	125 <1 730 <1 527 4418 958 1162	180 2 702 <1 468 3901 821 1037	153 0 754 1 472 4123 867 1033
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	200 85 525 4300 1000 1100 20200	125 <1 730 <1 527 4418 958 1162 21291	180 2 702 <1 468 3901 821 1037 18913	153 0 754 1 472 4123 867 1033 21675
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	200 85 525 4300 1000 1100 20200 limit/base	125 <1 730 <1 527 4418 958 1162 21291 current	180 2 702 <1 468 3901 821 1037 18913 history1	153 0 754 1 472 4123 867 1033 21675 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	200 85 525 4300 1000 1100 20200 limit/base	125 <1 730 <1 527 4418 958 1162 21291 current	180 2 702 <1 468 3901 821 1037 18913 history1	153 0 754 1 472 4123 867 1033 21675 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	200  85  525  4300  1000  1100  20200  limit/base >20	125 <1 730 <1 527 4418 958 1162 21291 current 13	180 2 702 <1 468 3901 821 1037 18913 history1 12 5	153 0 754 1 472 4123 867 1033 21675 history2 11 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	200  85  525  4300  1000  1100  20200  limit/base >20  >20	125 <1 730 <1 527 4418 958 1162 21291 current 13 2 3	180 2 702 <1 468 3901 821 1037 18913 history1 12 5 4	153 0 754 1 472 4123 867 1033 21675 history2 11 3 8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	200  85  525  4300 1000 1100 20200 limit/base >20  selfor in the selfor	125 <1 730 <1 527 4418 958 1162 21291 current 13 2 3 current	180 2 702 <1 468 3901 821 1037 18913 history1 12 5 4 history1	153 0 754 1 472 4123 867 1033 21675 history2 11 3 8
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  Method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	200  85  525  4300 1000 1100 20200  limit/base >20    limit/base >3	125 <1 730 <1 527 4418 958 1162 21291 current 13 2 3 current 1.3	180 2 702 <1 468 3901 821 1037 18913 history1 12 5 4 history1 0.7	153 0 754 1 472 4123 867 1033 21675 history2 11 3 8 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  method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	200  85  525  4300 1000 1100 20200 limit/base >20  >20  limit/base >3 >20	125 <1 730 <1 527 4418 958 1162 21291 current 13 2 3 current 1.3 14.1	180 2 702 <1 468 3901 821 1037 18913 history1 12 5 4 history1 0.7 10.5	153 0 754 1 472 4123 867 1033 21675 history2 11 3 8 history2 1.2 14.0
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  Method  *ASTM D5185m ASTM D7844  *ASTM D7624  *ASTM D76145	200  85  525  4300  1000  1100  20200  limit/base  >20  >20  limit/base  >3  >20  >30	125 <1 730 <1 527 4418 958 1162 21291 current 13 2 3 current 1.3 14.1 36.1 current	180 2 702 <1 468 3901 821 1037 18913 history1 12 5 4 history1 0.7 10.5 29.2	153 0 754 1 472 4123 867 1033 21675 history2 11 3 8 history2 1.2 14.0 36.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm	ASTM D5185m  METHOD  *ASTM D5185m ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  METHOD  *ASTM D7844  *ASTM D7624  *ASTM D7415  METHOD	200  85  525  4300 1000 1100 20200  limit/base >20  >20  limit/base >3 >20 >30  limit/base	125 <1 730 <1 527 4418 958 1162 21291 current 13 2 3 current 1.3 14.1 36.1	180 2 702 <1 468 3901 821 1037 18913 history1 12 5 4 history1 0.7 10.5 29.2 history1	153 0 754 1 472 4123 867 1033 21675 history2 11 3 8 history2 1.2 14.0 36.7



# **OIL ANALYSIS REPORT**



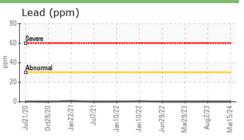


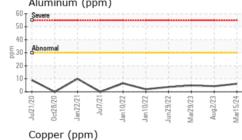
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

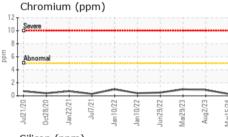
I LOID I NOI LI	TILO	memou			HISTOLYT	HISTOLYZ
Visc @ 100°C	cSt	ASTM D445	14.5	14.9	14.9	14.5

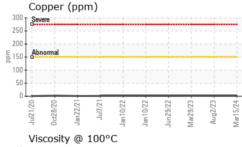
Severe									
Abnor	mal								
50+							$\wedge$		
	***********	-	/		\_	/		Y	
Jul21/20	0.			- 2	-2		- 53		
2	0ct28/20	Jan 22/2	Jul7/21	Jan 10/22	Jan 10/22	Jun29/22	Mar29/23	Aug2/23	M-v1E/24

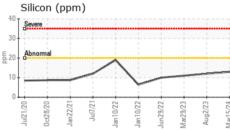
**GRAPHS** 

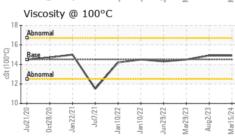


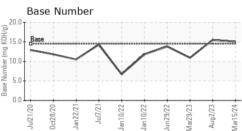














Certificate L2367

Laboratory Sample No.

: HPL0002277 Lab Number : 06123884 Unique Number: 10938035 Test Package : MOB 2

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 20 Mar 2024 : 21 Mar 2024 **Tested** 

: 22 Mar 2024 - Don Baldridge Diagnosed

**MUSCATINE POWER AND WATER** 

3205 CEDAR STREET MUSCATINE, IA US 52761

Contact: JUSTIN CONKLIN

justin.conklin@mpw.org T: (563)262-3351

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)

Report Id: MUSMUSIA [WUSCAR] 06123884 (Generated: 03/22/2024 23:57:11) Rev: 1

Submitted By: JONATHAN KLEIN

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