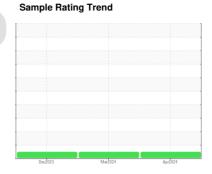


OIL ANALYSIS REPORT

Bernardsville **FREIGHTLINER 2493**

Diesel Engine

GIBRALTAR 15W/40 SUPER S-3 LX (11)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

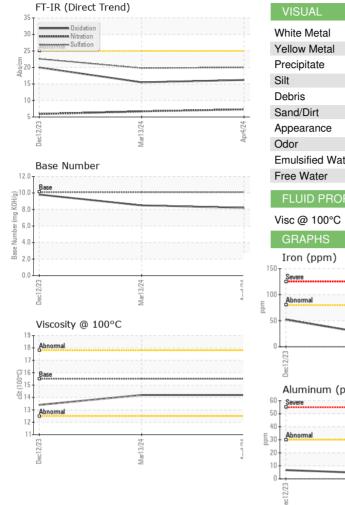
Fluid Condition

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

Sample Number Client Info WC0900074 WC0900072 WC0875339 Sample Date Client Info O4 Apr 2024 13 Mar 2024 12 Dec 2023 12 Dec 2023 13 Mar 2024 12 Dec 2023 10 O	OANDI E INEODI	ATION		11 11 11			
Sample Date	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 0 0 10310 Oil Age hrs Client Info 11138 6991 0 Oil Changed Client Info Changed NoRMAL NORMAL NORMAL Sample Status Image: Contract Info Changed NoRMAL NORMAL NORMAL CONTAMINATION method Imitibase current history1 history2 Fuel WC Method >5 <1.0						WC0900072	WC0875339
Oil Age hrs Client Info 11138 6991 0 Oil Changed Sample Status Client Info Changed Changed Not Changed N/A NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	•		Client Info		04 Apr 2024	13 Mar 2024	12 Dec 2023
Oil Changed Client Info Changed NORMAL NORMAL NORMAL NORMAL NORMAL	Machine Age	hrs	Client Info			-	
NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 history2	-	hrs	Client Info		11138	6991	
Fuel	Oil Changed		Client Info		Changed	Not Changd	N/A
Fuel WC Method S5 <1.0 <1.0 <1.0 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limil/base current history1 history2 Iron ppm ASTM D5185m >80 23 19 52 Chromium ppm ASTM D5185m >5 <1	CONTAMINATION	J	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>80	23	19	52
Titanium	Chromium	ppm	ASTM D5185m	>5	<1	0	<1
Silver ppm ASTM D5185m >3 0 0 <1 Aluminum ppm ASTM D5185m >30 5 4 7 Lead ppm ASTM D5185m >30 0 0 0 Copper ppm ASTM D5185m >150 7 4 9 Tin ppm ASTM D5185m >5 0 <1 <1 Vanadium ppm ASTM D5185m <1 0 <1 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 Boron ppm ASTM D5185m 18 20 55 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Manganesium ppm ASTM D5185m 0 1 <1 <1 <1 <1 Calcium ppm ASTM D5185m 1050 <t< td=""><th>Nickel</th><td>ppm</td><td>ASTM D5185m</td><td>>2</td><th>0</th><td>0</td><td><1</td></t<>	Nickel	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	Titanium	ppm	ASTM D5185m		<1	0	0
Lead ppm ASTM D5185m >30 0 0 0 Copper ppm ASTM D5185m >150 7 4 9 Tin ppm ASTM D5185m >5 0 <1 <1 Vanadium ppm ASTM D5185m <1 0 <1 <1 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2<	Silver	ppm	ASTM D5185m	>3	0	0	<1
Copper ppm ASTM D5185m >150 7 4 9 Tin ppm ASTM D5185m >5 0 <1 <1 Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 66 53 52 41 Manganese ppm ASTM D5185m 1000 719 735 547 Calcium ppm ASTM D5185m 1050 1504 1370 1570 Phosphorus ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426	Aluminum	ppm	ASTM D5185m	>30	5	4	7
Tin	Lead	ppm	ASTM D5185m	>30	0	0	0
Vanadium ppm ASTM D5185m <1	Copper	ppm	ASTM D5185m	>150	7	4	9
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 18 20 55 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m 1000 719 735 547 Calcium ppm ASTM D5185m 1050 1504 1370 1570 Phosphorus ppm ASTM D5185m 1050 1504 1370 1570 Phosphorus ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7	Tin	ppm	ASTM D5185m	>5	0	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 66 53 52 41 Manganese ppm ASTM D5185m 1000 719 735 547 Calcium ppm ASTM D5185m 1050 1504 1370 1570 Phosphorus ppm ASTM D5185m 1050 981 924 756 Zinc ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % "ASTM D7844 >3 0.4 0.3 0.2	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 66 53 52 41 Manganese ppm ASTM D5185m 1000 719 735 547 Calcium ppm ASTM D5185m 1050 1504 1370 1570 Phosphorus ppm ASTM D5185m 1150 981 924 756 Zinc ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624 >20 7.3 6.	Boron	ppm	ASTM D5185m		18	20	55
Manganese ppm ASTM D5185m <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 1000 719 735 547 Calcium ppm ASTM D5185m 1050 1504 1370 1570 Phosphorus ppm ASTM D5185m 1150 981 924 756 Zinc ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m 20 3 3 7 Sodium ppm ASTM D5185m 20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % "ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm "ASTM D7415 >30 20.0	Molybdenum	ppm	ASTM D5185m	66	53	52	41
Calcium ppm ASTM D5185m 1050 1504 1370 1570 Phosphorus ppm ASTM D5185m 1150 981 924 756 Zinc ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.3 0.2 Nitration Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base curren	Manganese	ppm	ASTM D5185m		<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 981 924 756 Zinc ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m 2 <1 1 Potassium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current <th>Magnesium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>1000</th> <th>719</th> <th>735</th> <th>547</th>	Magnesium	ppm	ASTM D5185m	1000	719	735	547
Zinc ppm ASTM D5185m 1270 1216 1180 944 Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m 2 <1 1 1 Potassium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 <th>Calcium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>1050</th> <th>1504</th> <th>1370</th> <th>1570</th>	Calcium	ppm	ASTM D5185m	1050	1504	1370	1570
Sulfur ppm ASTM D5185m 3512 3387 2426 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m 2 <1 1 Potassium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	Phosphorus	ppm	ASTM D5185m	1150	981	924	756
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m 2 <1 1 Potassium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	Zinc	ppm	ASTM D5185m	1270	1216	1180	944
Silicon ppm ASTM D5185m >20 3 3 7 Sodium ppm ASTM D5185m 2 <1	Sulfur	ppm	ASTM D5185m		3512	3387	2426
Sodium ppm ASTM D5185m 2 <1	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 8 4 9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	Silicon	ppm	ASTM D5185m	>20	3	3	7
INFRA-RED	Sodium	ppm	ASTM D5185m		2	<1	1
Soot % % *ASTM D7844 >3 0.4 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	Potassium	ppm	ASTM D5185m	>20	8	4	9
Nitration Abs/cm *ASTM D7624 >20 7.3 6.7 5.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.0 19.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	Soot %	%	*ASTM D7844	>3	0.4	0.3	0.2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	Nitration	Abs/cm	*ASTM D7624	>20	7.3	6.7	5.9
Oxidation Abs/.1mm *ASTM D7414 >25 16.2 15.5 20.0	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.0	19.8	22.6
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.2	15.5	20.0
	Base Number (BN)	mg KOH/g	ASTM D2896	10.1	8.2	8.5	9.81



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
FLUID PROPERT	TES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.5	14.2	14.2	13.4
GRAPHS						
Iron (nnm)				Lead (nnm)		

Iron (ppm)	Lead (p	pm)	
Severe	80 Severe		
Abnormal	E		
	Abnormal		
Dec12/23	Apr4/24 Dec12/23	Mar13,24	
ă ≦ Aluminum (ppm)		.im (ppm)	
Severe	12 10 Severe		
Abnormal	8		
Abnormal	E 6 Abnormal		
	2		
Dec12/23 +	Apr4/24 +	Mar13/24	
Copper (ppm) Severe	Silicon (ppm)	
	Severe 30 -		
Abnormal	E 20 - Abnormal		
	10-		
5	4: 0 5	9	
Dec12/23	Apr4/24 Dec12/23	Mar13/24	
Viscosity @ 100°C	Base Nu		
Abnormal	12.0 Base 岩10.0		****************
Base	(0)HOV 8.0 - 8.0 - 1.0 -		
Abnormal	and 4.0		
	2.0 8 0.0		
Dec12/23 -	Apr4/24	Mar13/24 -	
Mar	Ap	Mar	





Certificate 12367

Laboratory

Lab Number : 06142010

Sample No. : WC0900074 Unique Number : 10966818

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 08 Apr 2024 **Tested** Diagnosed

: 09 Apr 2024 : 09 Apr 2024 - Wes Davis

33 OLD QUARRY ROAD BERNARDSVILLE, NJ

US 07924 Contact: Pablo Chardon PChardon@interstatewaste.com

Test Package : MOB 1 (Additional Tests: TBN) 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)

INTERSTATE WASTE-BERNARDSVILLE

T:

F: