



# OIL ANALYSIS REPORT

WEAR	<b>NORMAL</b>
CONTAMINATION	<b>NORMAL</b>
FLUID CONDITION	<b>NORMAL</b>

Machine Id  
**FREIGHTLINER 3228**  
Component  
**Front Diesel Engine**  
Fluid  
**SHELL 10W30 (44 QTS)**

## RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>WC0916501</b>	WC0916486	WC0878580
Sample Date		Client Info		<b>10 Jun 2024</b>	22 Mar 2024	05 Dec 2023
Machine Age	mls	Client Info		<b>548640</b>	532215	509421
Oil Age	mls	Client Info		<b>16425</b>	22798	23362
Filter Age	mls	Client Info		<b>16425</b>	22798	23362
Oil Changed		Client Info		<b>N/A</b>	Changed	Changed
Filter Changed		Client Info		<b>N/A</b>	Changed	Changed
Sample Status				<b>NORMAL</b>	NORMAL	NORMAL

## WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>165	<b>14</b>	15	14
Chromium	ppm	ASTM D5185m	>5	<b>&lt;1</b>	<1	<1
Nickel	ppm	ASTM D5185m	>4	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m	>2	<b>&lt;1</b>	0	0
Silver	ppm	ASTM D5185m	>2	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>20	<b>2</b>	2	2
Lead	ppm	ASTM D5185m	>150	<b>2</b>	3	2
Copper	ppm	ASTM D5185m	>90	<b>&lt;1</b>	0	1
Tin	ppm	ASTM D5185m	>5	<b>0</b>	<1	0
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

## CONTAMINATION

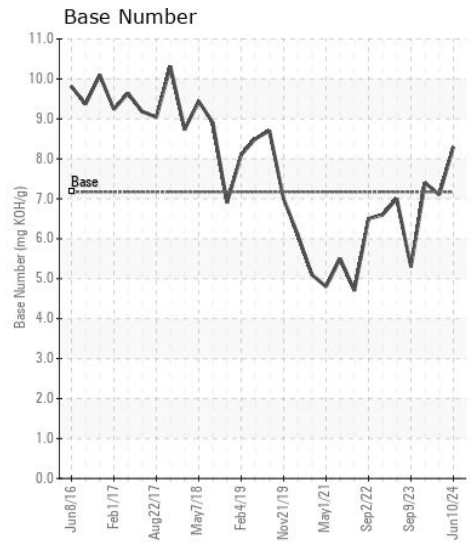
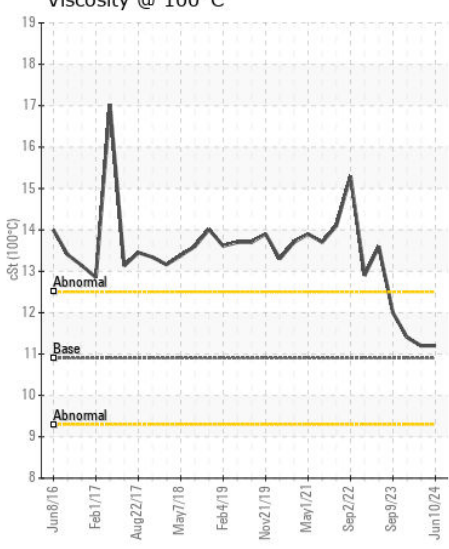
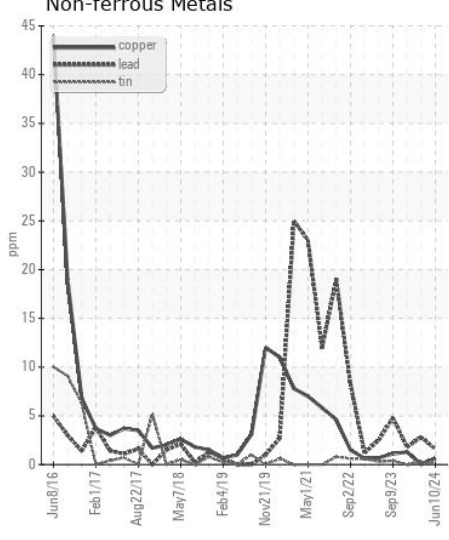
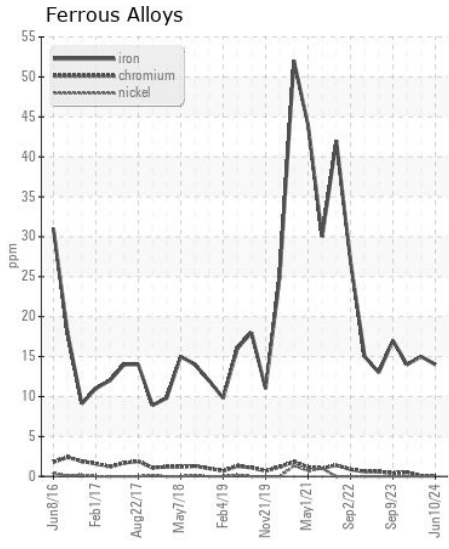
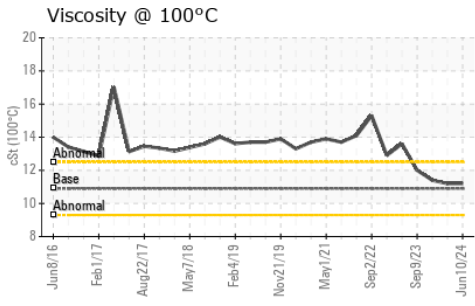
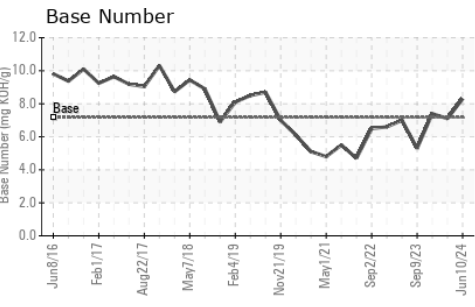
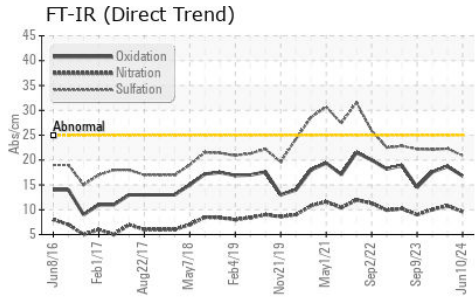
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>35	<b>3</b>	3	5
Potassium	ppm	ASTM D5185m	>20	<b>3</b>	1	3
Fuel		WC Method	>3.0	<b>&lt;1.0</b>	<1.0	<1.0
Water		WC Method	>0.2	<b>NEG</b>	NEG	NEG
Glycol		WC Method		<b>NEG</b>	NEG	NEG
Soot %	%	*ASTM D7844	>7.5	<b>0.5</b>	0.6	0.5
Nitration	Abs/cm	*ASTM D7624	>20	<b>9.6</b>	10.8	10.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>20.9</b>	22.3	22.1
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	<b>NEG</b>	NEG	NEG

## 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.

Sodium	ppm	ASTM D5185m		<b>2</b>	0	4
Boron	ppm	ASTM D5185m		<b>2</b>	2	2
Barium	ppm	ASTM D5185m		<b>0</b>	0	<1
Molybdenum	ppm	ASTM D5185m		<b>63</b>	61	57
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	0	<1
Magnesium	ppm	ASTM D5185m	470	<b>1057</b>	954	857
Calcium	ppm	ASTM D5185m	1150	<b>1246</b>	1144	1317
Phosphorus	ppm	ASTM D5185m	94	<b>1146</b>	1078	1118
Zinc	ppm	ASTM D5185m	1030	<b>1407</b>	1268	1307
Sulfur	ppm	ASTM D5185m		<b>3843</b>	3408	3107
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>16.8</b>	18.7	17.6
Base Number (BN)	mg KOH/g	ASTM D2896	7.17	<b>8.3</b>	7.1	7.4
Visc @ 100°C	cSt	ASTM D445	10.90	<b>11.2</b>	11.2	11.4



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC0916501  
**Lab Number** : 06219185  
**Unique Number** : 11097382  
**Test Package** : FLEET

**CARCO TRANSPORTATION**  
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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)