



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

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		WC0916486	WC0878580	WC0854021
Sample Date		Client Info		22 Mar 2024	05 Dec 2023	09 Sep 2023
Machine Age	mls	Client Info		532215	509421	486059
Oil Age	mls	Client Info		22798	23362	23401
Filter Age	mls	Client Info		22798	23362	23401
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>165	15	14	17
Chromium	ppm	ASTM D5185m	>5	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m	>2	0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	2	4
Lead	ppm	ASTM D5185m	>150	3	2	5
Copper	ppm	ASTM D5185m	>90	0	1	1
Tin	ppm	ASTM D5185m	>5	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

There is no indication of any contamination in the oil.

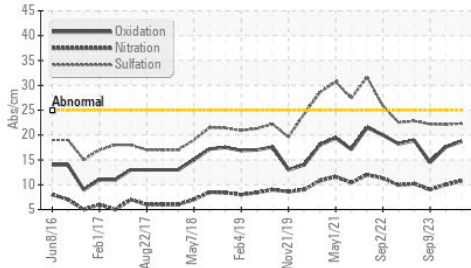
Silicon	ppm	ASTM D5185m	>35	3	5	6
Potassium	ppm	ASTM D5185m	>20	1	3	6
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>7.5	0.6	0.5	0.5
Nitration	Abs/cm	*ASTM D7624	>20	10.8	10.0	9.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	22.3	22.1	22.2
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

FLUID CONDITION

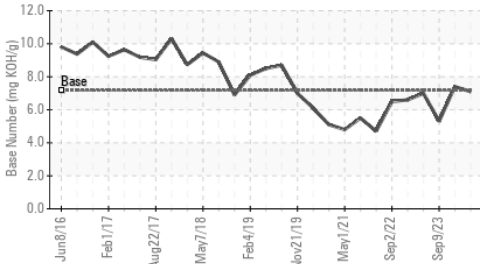
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		0	4	2
Boron	ppm	ASTM D5185m		2	2	6
Barium	ppm	ASTM D5185m		0	<1	0
Molybdenum	ppm	ASTM D5185m		61	57	25
Manganese	ppm	ASTM D5185m		0	<1	<1
Magnesium	ppm	ASTM D5185m	470	954	857	144
Calcium	ppm	ASTM D5185m	1150	1144	1317	2430
Phosphorus	ppm	ASTM D5185m	94	1078	1118	1012
Zinc	ppm	ASTM D5185m	1030	1268	1307	1268
Sulfur	ppm	ASTM D5185m		3408	3107	4462
Oxidation	Abs/.1mm	*ASTM D7414	>25	18.7	17.6	14.5
Base Number (BN)	mg KOH/g	ASTM D2896	7.17	7.1	7.4	5.3
Visc @ 100°C	cSt	ASTM D445	10.90	11.2	11.4	12.0

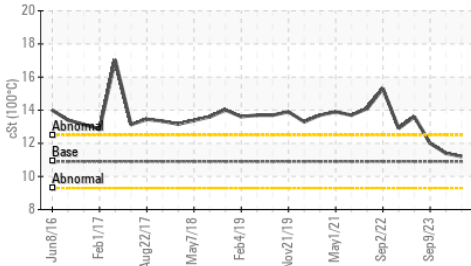
FT-IR (Direct Trend)



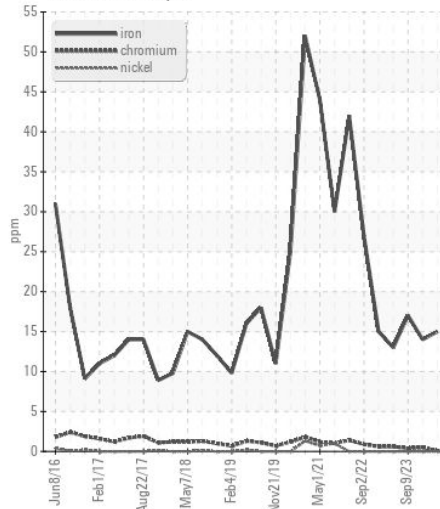
Base Number



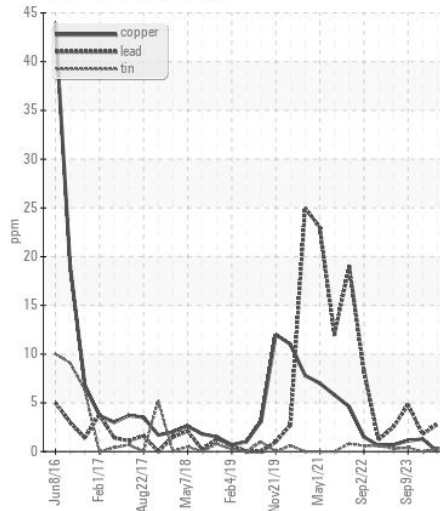
Viscosity @ 100°C



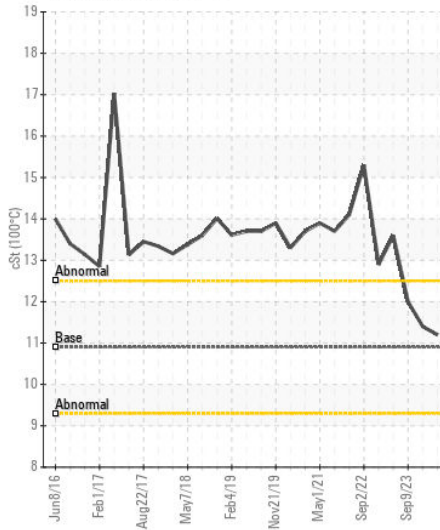
Ferrous Alloys



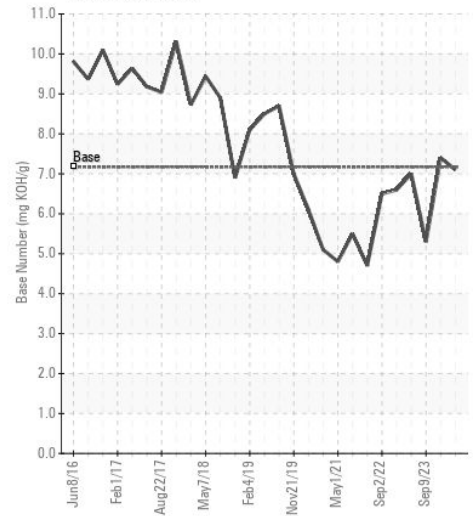
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : WC0916486

Lab Number : 06151508

Unique Number : 10981586

Test Package : FLEET

Received : 17 Apr 2024

Tested : 18 Apr 2024

Diagnosed : 18 Apr 2024 - Wes Davis

CARCO TRANSPORTATION

3403 EAST ROOSEVELT ROAD

LITTLE ROCK, AR

US 72206

Contact: DENNIS CATES

denniscates@carcotrans.com

T: (800)967-0777

F:

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)