



WEAR	ABNORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
FREIGHTLINER 220

Component
Diesel Engine

Fluid
CASTROL VECTON 10W30 (--- LTR)

RECOMMENDATION

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		LW0007116	LW0002334	LW0001100
Sample Date		Client Info		14 Jun 2023	12 Jul 2021	11 Dec 2020
Machine Age	mls	Client Info		828426	440534	338142
Oil Age	mls	Client Info		440534	50000	100000
Filter Age	mls	Client Info		0	25000	25000
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	NORMAL	NORMAL

WEAR

An increase in the aluminum level is noted. Cylinder, crank, or cam shaft wear is indicated.

Iron	ppm	ASTM D5185m	>80	▲ 114	73	50
Chromium	ppm	ASTM D5185m	>5	▲ 8	5	4
Nickel	ppm	ASTM D5185m	>2	3	2	2
Titanium	ppm	ASTM D5185m		10	83	64
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>30	▲ 29	17	8
Lead	ppm	ASTM D5185m	>30	0	<1	<1
Copper	ppm	ASTM D5185m	>150	11	26	13
Tin	ppm	ASTM D5185m	>5	1	<1	1
Vanadium	ppm	ASTM D5185m		0	1	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

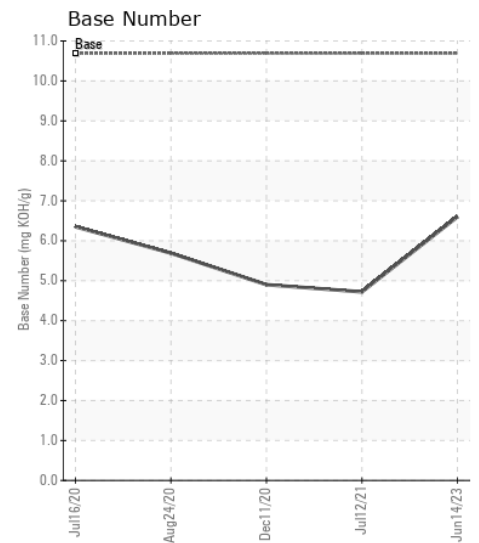
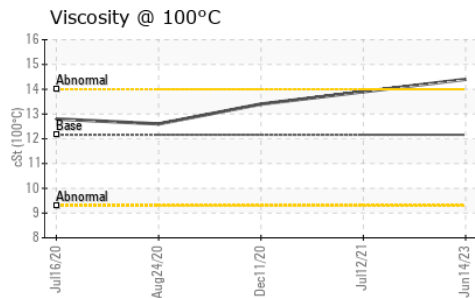
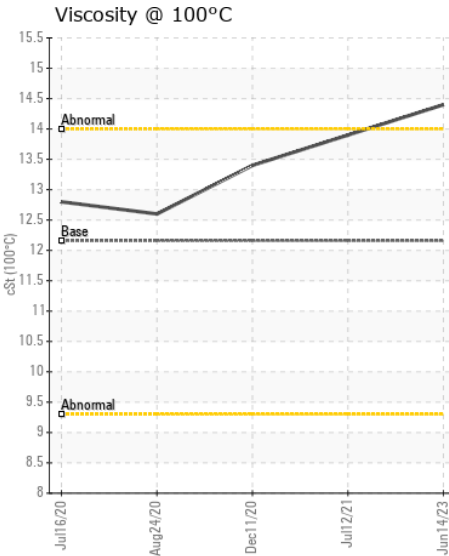
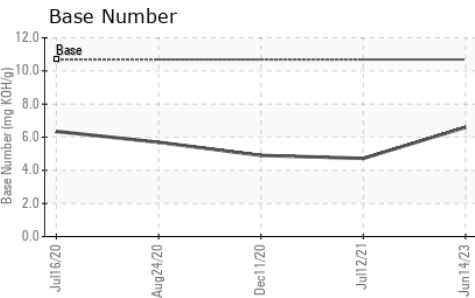
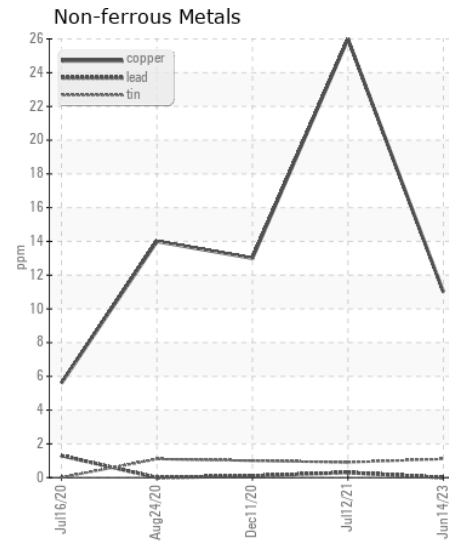
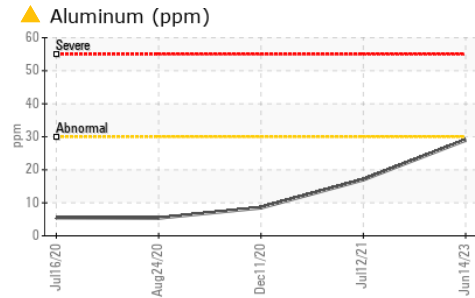
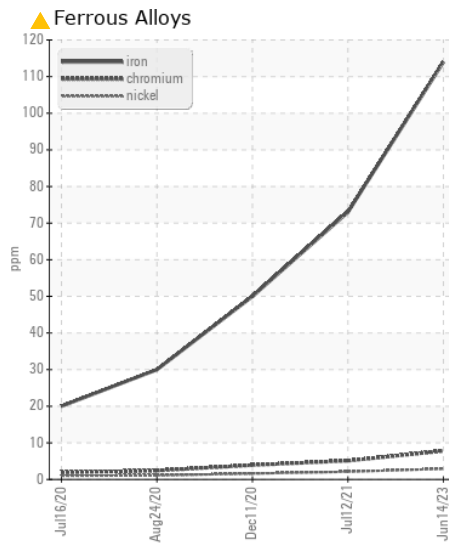
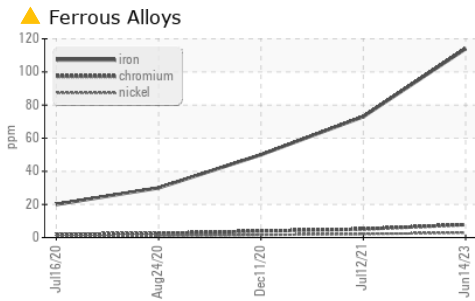
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>20	8	9	6
Potassium	ppm	ASTM D5185m	>20	5	14	10
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	2.6	1.6	1.2
Nitration	Abs/cm	*ASTM D7624	>20	15.4	15.8	13.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	32.3	37.1	31.7
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	6	5
Boron	ppm	ASTM D5185m		31	26	18
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		59	12	18
Manganese	ppm	ASTM D5185m		2	2	<1
Magnesium	ppm	ASTM D5185m		759	487	601
Calcium	ppm	ASTM D5185m		1491	1849	1757
Phosphorus	ppm	ASTM D5185m		1044	1041	1045
Zinc	ppm	ASTM D5185m		1219	1281	1403
Sulfur	ppm	ASTM D5185m		2834	2718	2706
Oxidation	Abs/.1mm	*ASTM D7414	>25	32.1	34.8	28.6
Base Number (BN)	mg KOH/g	ASTM D2896	10.69	6.6	4.72	4.90
Visc @ 100°C	cSt	ASTM D445	12.16	14.4	13.9	13.4



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : LW0007116
Lab Number : 05893417
Unique Number : 10549227
Test Package : FLEET

Received : 10 Jul 2023
Tested : 11 Jul 2023
Diagnosed : 11 Jul 2023 - Sean Felton

LIV TRANSPORTATION, INC
 9809 INDUSTRIAL DRIVE
 BRIDGEVIEW, IL
 US 60455
 Contact: CHRIS BIELECKI
 CHRIS@LIVTRANSPORTATION.COM

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)

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F: