



OIL ANALYSIS REPORT

WEAR	ATTENTION
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL



Machine Id
2011 FREIGHTLINER 230
Component
Diesel Engine
Fluid
DIESEL ENGINE OIL SAE 15W40 (36 QTS)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		RW0004831	RW0003879	RW0003954
Sample Date		Client Info		21 Apr 2024	25 Feb 2023	06 Oct 2022
Machine Age	mls	Client Info		0	42145	40670
Oil Age	mls	Client Info		2050	1475	995
Filter Age	mls	Client Info		2050	1475	995
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>80	25	6	4
Chromium	ppm	ASTM D5185m	>5	<1	<1	1
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>30	7	2	0
Lead	ppm	ASTM D5185m	>30	<1	0	0
Copper	ppm	ASTM D5185m	>150	14	2	3
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

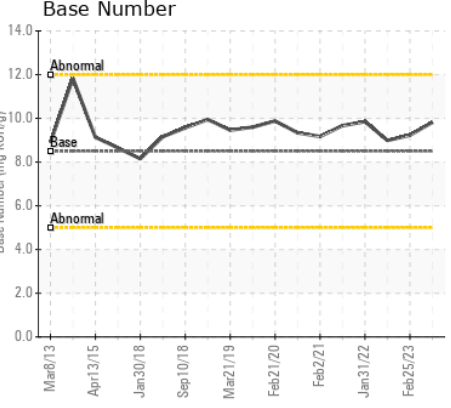
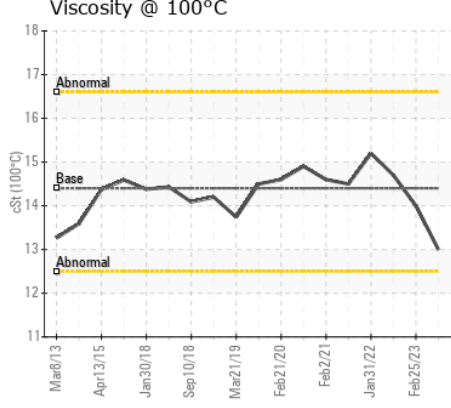
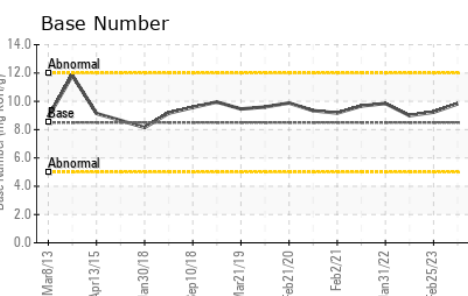
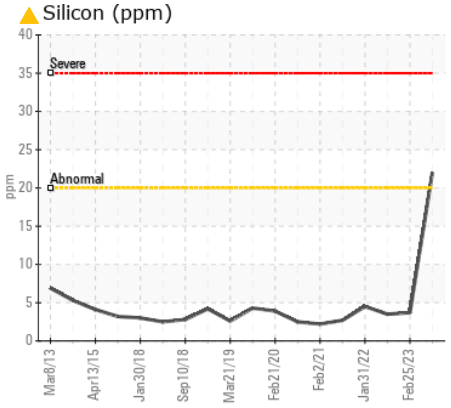
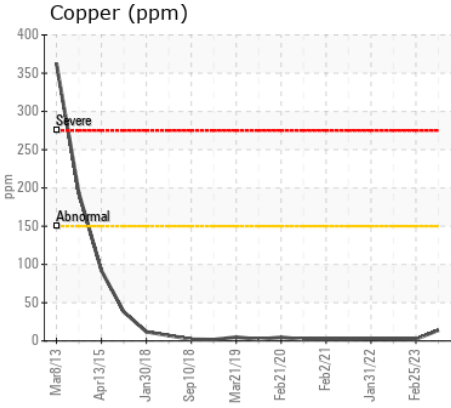
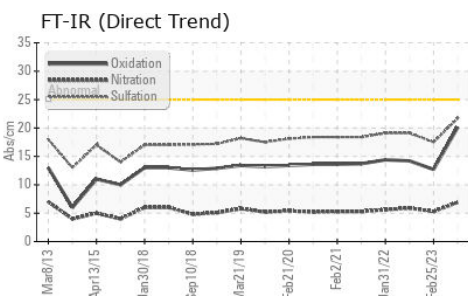
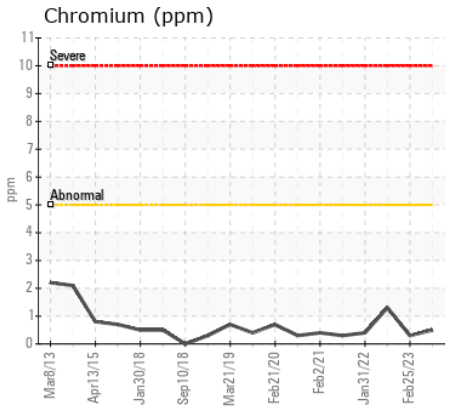
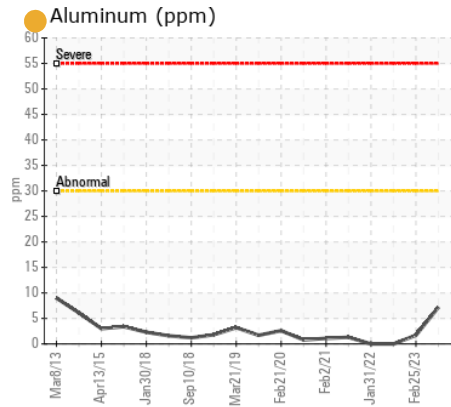
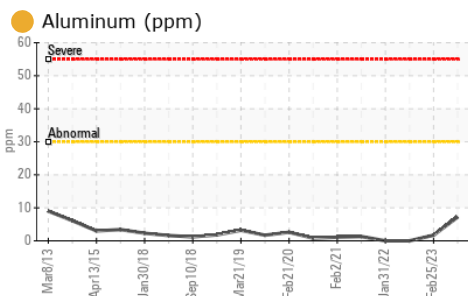
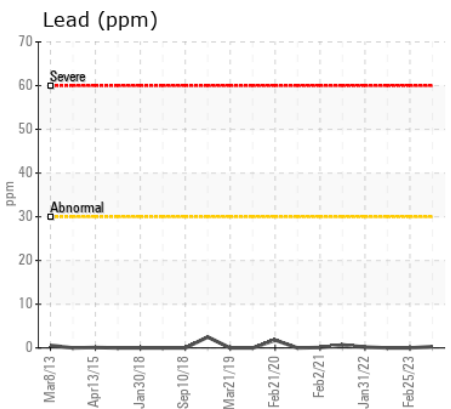
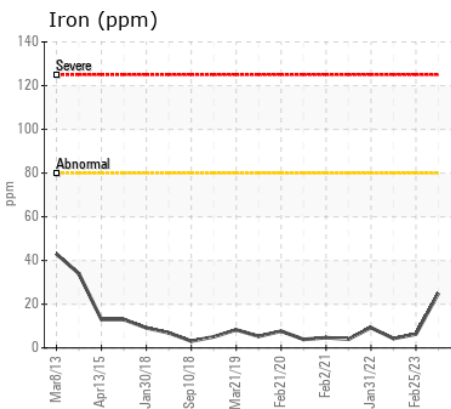
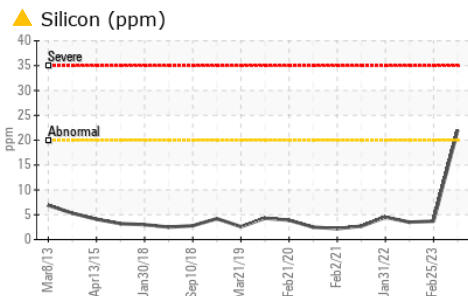
Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

Silicon	ppm	ASTM D5185m	>20	22	4	4
Potassium	ppm	ASTM D5185m	>20	22	1	2
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	0.1	0.2	0.2
Nitration	Abs/cm	*ASTM D7624	>20	6.9	5.3	5.9
Sulfation	Abs/.1mm	*ASTM D7415	>30	21.7	17.5	19.1
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	>158	2	<1	2
Boron	ppm	ASTM D5185m	250	66	8	0
Barium	ppm	ASTM D5185m	10	1	0	0
Molybdenum	ppm	ASTM D5185m	100	45	69	57
Manganese	ppm	ASTM D5185m		8	<1	<1
Magnesium	ppm	ASTM D5185m	450	542	985	963
Calcium	ppm	ASTM D5185m	3000	1508	1219	1102
Phosphorus	ppm	ASTM D5185m	1150	759	1063	1000
Zinc	ppm	ASTM D5185m	1350	878	1306	1263
Sulfur	ppm	ASTM D5185m	4250	2647	3514	3531
Oxidation	Abs/.1mm	*ASTM D7414	>25	20.1	12.7	14.2
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	9.82	9.23	8.99
Visc @ 100°C	cSt	ASTM D445	14.4	13.0	14.0	14.7



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : RW0004831
Lab Number : 06155270
Unique Number : 10990693
Test Package : MOB 2

Received : 19 Apr 2024
Tested : 22 Apr 2024
Diagnosed : 24 Apr 2024 - Sean Felton

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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)