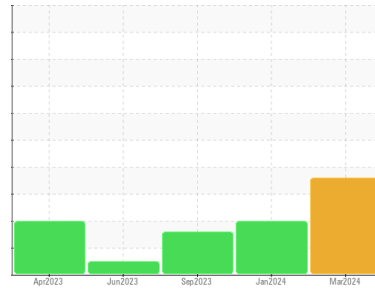




OIL ANALYSIS REPORT

Sample Rating Trend



DIRT



Area

[CONHER]

Machine Id

FREIGHTLINER LAMO - #194 Freightliner

Component

Diesel Engine

Fluid

Volvo Mineral 15W40 CI-4 (45 LTR)

DIAGNOSIS

Recommendation

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Resample at the next service interval to monitor. (Customer Sample Comment: Fluid: Volvo mineral CI-4 15W40. Sample taken after change KF-50 (30 min))

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of particulates present in the oil. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

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 INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		KL0014532	KL0013461	KL0012830
Sample Date	Client Info		28 Mar 2024	19 Jan 2024	16 Sep 2023
Machine Age	kms	Client Info	143139	119580	77741
Oil Age	kms	Client Info	129648	106089	64250
Oil Changed	Client Info		Not Chngd	Not Chngd	Not Chngd
Sample Status			ABNORMAL	ABNORMAL	ATTENTION

CONTAMINATION

	method	limit/base	current	history1	history2
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

WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>200	91	17	39
Chromium	ppm	ASTM D5185m	>6	3	<1	2
Nickel	ppm	ASTM D5185m	>3	0	0	<1
Titanium	ppm	ASTM D5185m	>2	<1	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>50	27	2	9
Lead	ppm	ASTM D5185m	>10	1	5	0
Copper	ppm	ASTM D5185m	>50	12	4	7
Tin	ppm	ASTM D5185m	>6	2	0	<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		12	6	17
Barium	ppm	ASTM D5185m		0	<1	0
Molybdenum	ppm	ASTM D5185m		42	2	54
Manganese	ppm	ASTM D5185m		1	0	<1
Magnesium	ppm	ASTM D5185m		511	16	740
Calcium	ppm	ASTM D5185m		2460	2430	2001
Phosphorus	ppm	ASTM D5185m		998	920	1044
Zinc	ppm	ASTM D5185m		1235	1138	1381
Sulfur	ppm	ASTM D5185m		4172	3591	3278

CONTAMINANTS

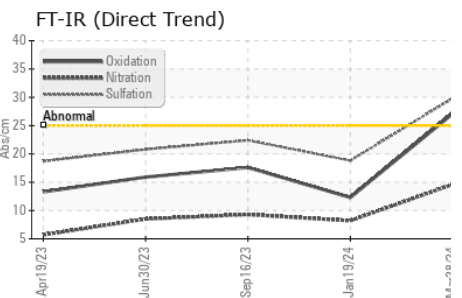
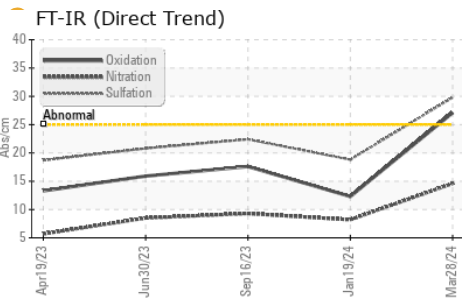
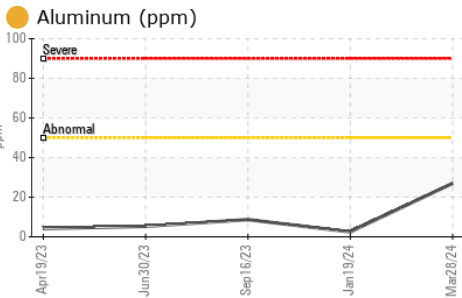
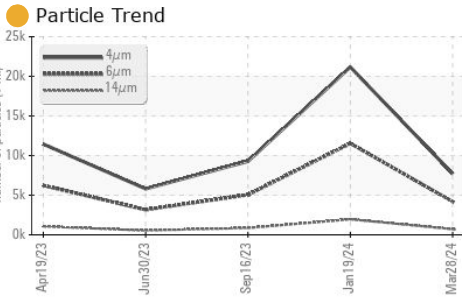
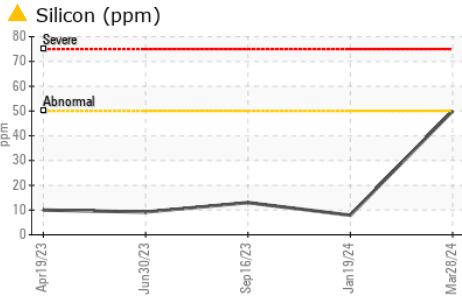
	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>50	50	8	13
Sodium	ppm	ASTM D5185m		7	3	3
Potassium	ppm	ASTM D5185m	>20	16	6	2

INFRA-RED

	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844	>3	1.6	0.4	0.8
Nitration	Abs/cm	*ASTM D7624	>20	14.6	8.2	9.3
Sulfation	Abs/1mm	*ASTM D7415	>30	29.8	18.8	22.4



OIL ANALYSIS REPORT



FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		7699	21166	9274
Particles >6µm	ASTM D7647	>5000	4194	▲ 11530	● 5052
Particles >14µm	ASTM D7647	>640	● 714	▲ 1962	● 860
Particles >21µm	ASTM D7647	>160	● 240	▲ 661	● 290
Particles >38µm	ASTM D7647	>40	37	▲ 102	45
Particles >71µm	ASTM D7647	>10	4	10	5
Oil Cleanliness	ISO 4406 (c)	>19/16	● 19/17	▲ 21/18	● 20/17

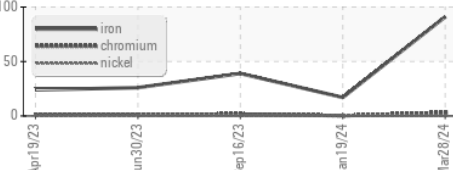
FLUID DEGRADATION	method	limit/base	current	history1	history2
Oxidation	Abs./1mm *ASTM D7414	>25	27.1	12.3	17.6
Base Number (BN)	mg KOH/g ASTM D2896		6.15	8.11	8.72

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

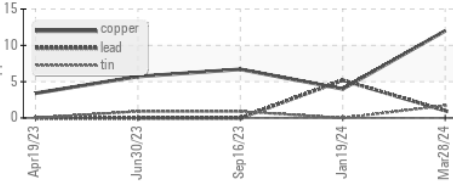
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt ASTM D445		16.4	14.1	14.8

GRAPHS

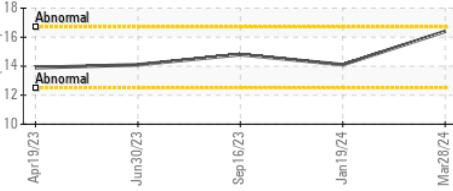
Ferrous Alloys



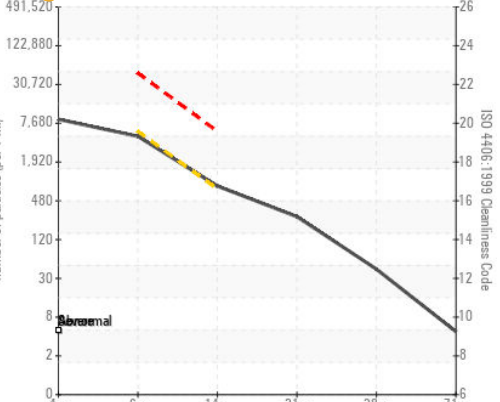
Non-ferrous Metals



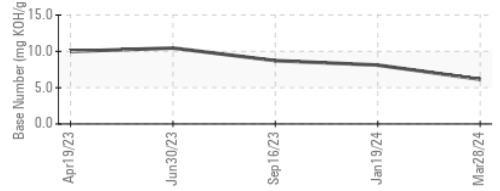
Viscosity @ 100°C



Particle Count



Base Number



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0014532 **Received** : 18 Apr 2024
Lab Number : 06153309 **Tested** : 23 Apr 2024
Unique Number : 10983387 **Diagnosed** : 23 Apr 2024 - Jonathan Hester
Test Package : MOB 2 (Additional Tests: PrtCount)

LAMO

NAVOJOA, MX

Contact: ANDRES MONROY
andres.monroy@cmoderna.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)

T:
F: