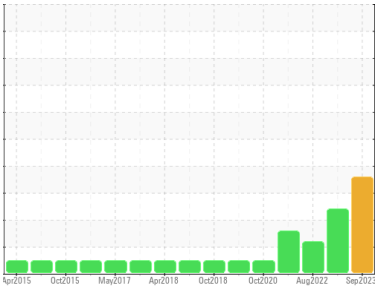
OIL ANALYSIS REPORT

Sample Rating Trend



SOOT

Machine Id
2007 FREIGHTLINER L-78
Component
Diesel Engine
Fluid
SHELL ROTELLA T 15W40 (44 QTS)

DIAGNOSIS

Recommendation
We advise that you check for faulty combustion, plugged air filters, or aftercoolers. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear
All component wear rates are normal.

Contamination
There is a moderate amount of particulates present in the oil. There is an abnormal amount of solids and carbon present in the oil.

Fluid Condition
The oil viscosity is higher than normal. The oil is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**KL0009558**	KL0009556	KL0006574
Sample Date		Client Info		**23 Sep 2023**	22 Jun 2023	23 Aug 2022
Machine Age	mls	Client Info		**86671**	52364	173810
Oil Age	mls	Client Info		**34307**	0	50470
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**SEVERE**	SEVERE	ABNORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	**<1.0**	<1.0	<1.0
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>200	**77**	169	139
Chromium	ppm	ASTM D5185m	>10	**2**	4	4
Nickel	ppm	ASTM D5185m	>4	**0**	<1	0
Titanium	ppm	ASTM D5185m	>2	**<1**	<1	<1
Silver	ppm	ASTM D5185m	>2	**0**	<1	0
Aluminum	ppm	ASTM D5185m	>30	**4**	1	4
Lead	ppm	ASTM D5185m	>30	**4**	16	23
Copper	ppm	ASTM D5185m	>30	**2**	3	2
Tin	ppm	ASTM D5185m	>4	**1**	2	2
Antimony	ppm	ASTM D5185m		**---**	---	---
Vanadium	ppm	ASTM D5185m		**0**	0	<1
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	316	**19**	27	20
Barium	ppm	ASTM D5185m	0.0	**0**	0	0
Molybdenum	ppm	ASTM D5185m	1.2	**69**	91	42
Manganese	ppm	ASTM D5185m		**<1**	2	2
Magnesium	ppm	ASTM D5185m	24	**292**	318	110
Calcium	ppm	ASTM D5185m	2292	**1456**	1773	1969
Phosphorus	ppm	ASTM D5185m	1064	**840**	937	870
Zinc	ppm	ASTM D5185m	1160	**1015**	1109	1054
Sulfur	ppm	ASTM D5185m	4996	**3491**	3040	3029

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>30	**9**	15	9
Sodium	ppm	ASTM D5185m		**0**	0	2
Potassium	ppm	ASTM D5185m	>20	**2**	2	2

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**8.5**	9.9	4.8
Nitration	Abs/cm	*ASTM D7624	>20	**31.4**	45.4	4.8
Sulfation	Abs/.1mm	*ASTM D7415	>30	**68.0**	76.6	21.8

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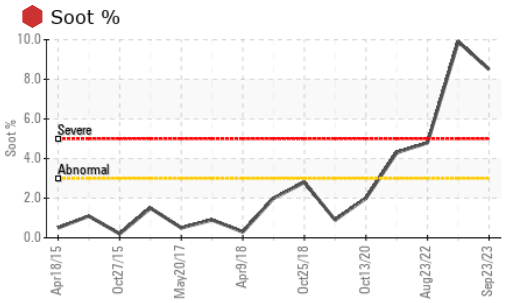
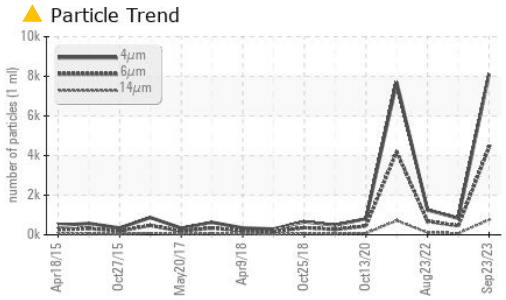
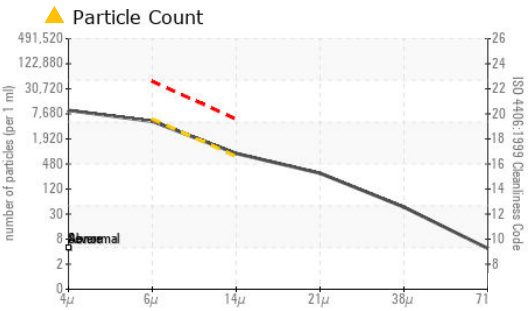
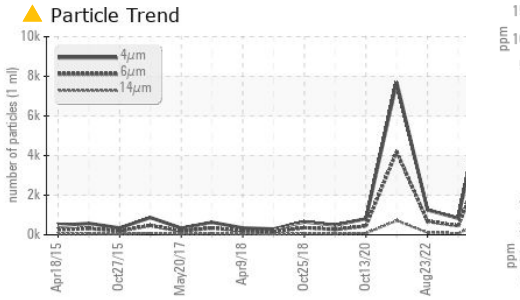
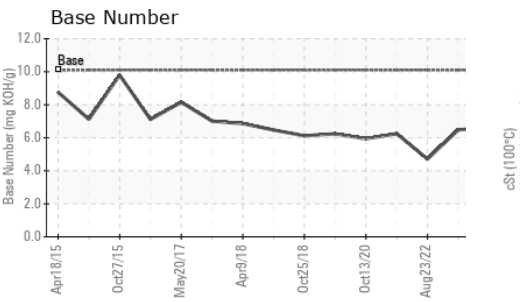










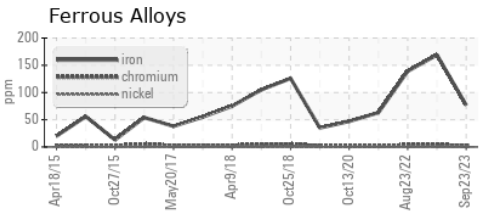
FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**8117**	835	1255
Particles >6µm		ASTM D7647	>5000	**4422**	455	684
Particles >14µm		ASTM D7647	>640	▲ **753**	77	116
Particles >21µm		ASTM D7647	>160	▲ **253**	26	39
Particles >38µm		ASTM D7647	>40	**39**	4	6
Particles >71µm		ASTM D7647	>10	**4**	0	1
Oil Cleanliness		ISO 4406 (c)	>19/16	▲ **19/17**	16/13	17/14

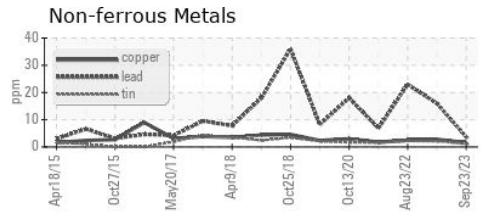
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**76.4**	105.0	5.1
Base Number (BN)	mg KOH/g	ASTM D2896	10.1	**6.62**	6.48	4.71

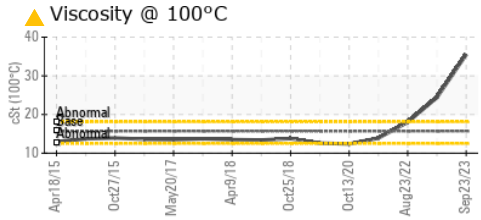
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	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

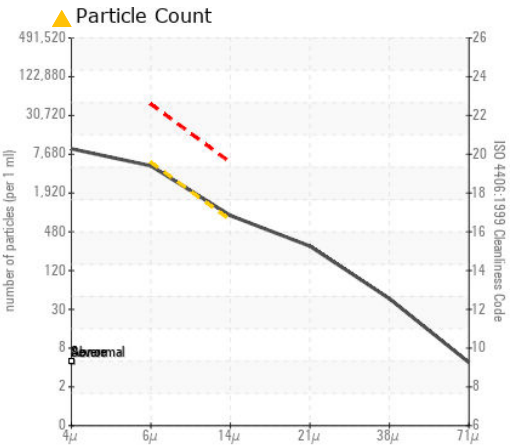
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.7	▲ **35.5**	▲ 24.4	▲ 18.0

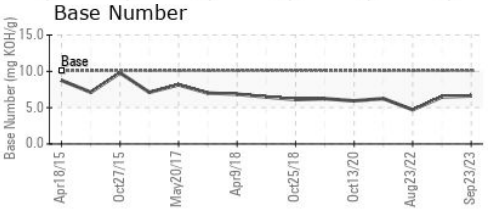
GRAPHS











Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0009558 **Received** : 02 Oct 2023
Lab Number : 05967176 **Diagnosed** : 04 Oct 2023
Unique Number : 10673727 **Diagnostician** : Don Baldridge
Test Package : MOB 2 (Additional Tests: PrtCount)

Certificate L2367

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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