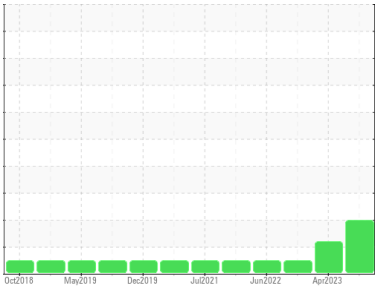
OIL ANALYSIS REPORT

Sample Rating Trend



ISO

Machine Id
FREIGHTLINER 35139
Component
Diesel Engine
Fluid
DIESEL ENGINE OIL SAE 15W40 (--- QTS)

DIAGNOSIS

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

Wear
All component wear rates are normal.

Contamination
There is a high amount of particulates present in the oil.

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		**KL0012038**	KLM2339292	KL0010011
Sample Date		Client Info		**28 Jul 2023**	07 Apr 2023	03 Nov 2022
Machine Age	mls	Client Info		**223960**	221927	219580
Oil Age	mls	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**ABNORMAL**	ATTENTION	NORMAL

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	>65	**58**	18	16
Chromium	ppm	ASTM D5185m	>5	**2**	<1	<1
Nickel	ppm	ASTM D5185m	>3	**0**	<1	<1
Titanium	ppm	ASTM D5185m	>5	**<1**	<1	<1
Silver	ppm	ASTM D5185m	>2	**0**	0	<1
Aluminum	ppm	ASTM D5185m	>35	**3**	3	3
Lead	ppm	ASTM D5185m	>10	**0**	0	2
Copper	ppm	ASTM D5185m	>180	**3**	7	6
Tin	ppm	ASTM D5185m	>8	**<1**	<1	<1
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

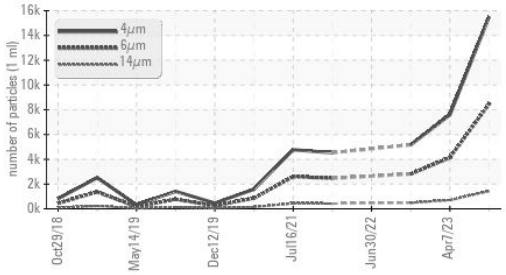
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	250	**31**	<1	4
Barium	ppm	ASTM D5185m	10	**0**	0	0
Molybdenum	ppm	ASTM D5185m	100	**70**	6	6
Manganese	ppm	ASTM D5185m		**<1**	<1	<1
Magnesium	ppm	ASTM D5185m	450	**1147**	89	87
Calcium	ppm	ASTM D5185m	3000	**1300**	2351	2405
Phosphorus	ppm	ASTM D5185m	1150	**1125**	884	870
Zinc	ppm	ASTM D5185m	1350	**1425**	1134	1147
Sulfur	ppm	ASTM D5185m	4250	**4245**	4020	3738

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>15	**9**	10	8
Sodium	ppm	ASTM D5185m	>158	**9**	6	5
Potassium	ppm	ASTM D5185m	>20	**5**	5	5

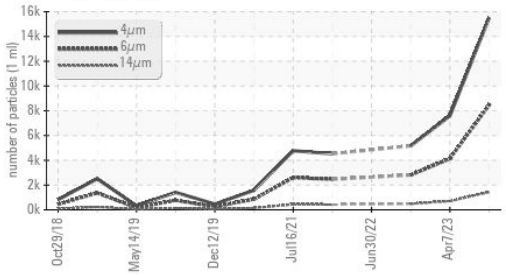
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**1**	0.7	0.7
Nitration	Abs/cm	*ASTM D7624	>20	**11.8**	9.5	9.9
Sulfation	Abs/.1mm	*ASTM D7415	>30	**28.0**	24.1	24.9

OIL ANALYSIS REPORT

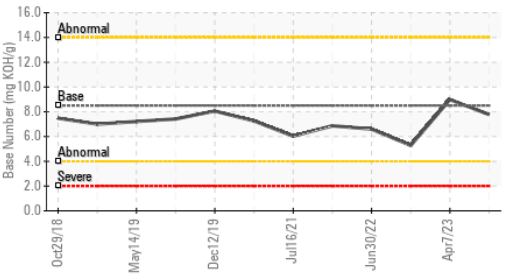
Particle Trend



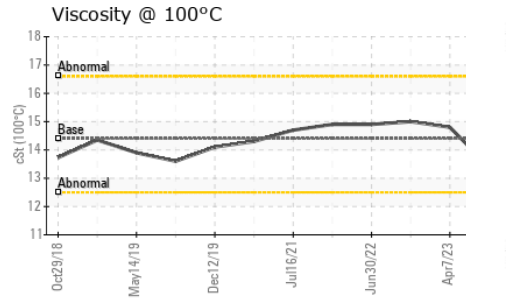
Particle Trend



Base Number



Viscosity @ 100°C



FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		**15503**	7595	5170
Particles >6µm	ASTM D7647	>5000	▲ **8445**	4137	2816
Particles >14µm	ASTM D7647	>640	▲ **1437**	▲ 704	479
Particles >21µm	ASTM D7647	>160	▲ **484**	▲ 237	161
Particles >38µm	ASTM D7647	>40	▲ **75**	37	25
Particles >71µm	ASTM D7647	>10	**8**	4	3
Oil Cleanliness	ISO 4406 (c)	>19/16	▲ **20/18**	▲ 19/17	19/16

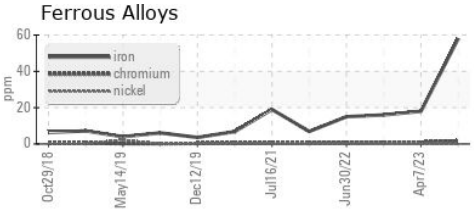
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**28.9**	15.2	15.6
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	**7.78**	8.98	5.28

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

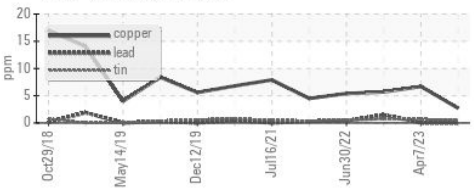
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	**13.4**	14.8	15.0

GRAPHS

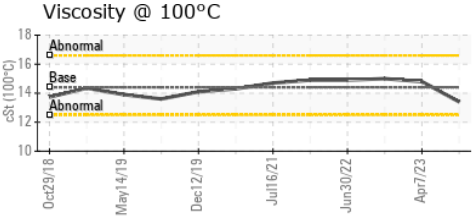
Ferrous Alloys



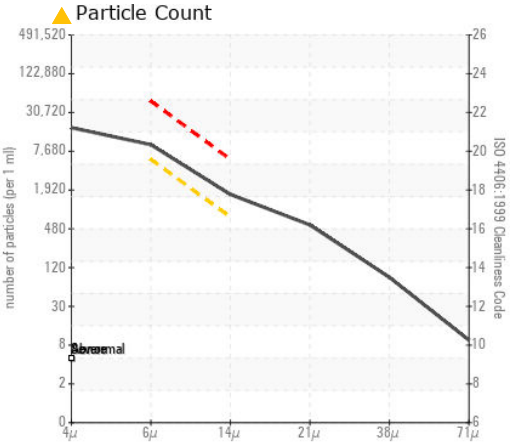
Non-ferrous Metals



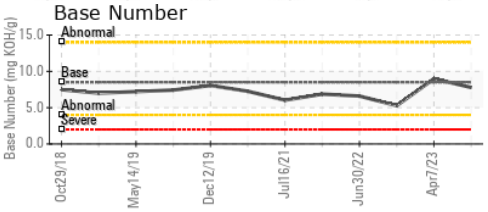
Viscosity @ 100°C



Particle Count



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0012038 **Received** : 14 Aug 2023
Lab Number : 05923550 **Diagnosed** : 15 Aug 2023
Unique Number : 10603497 **Diagnostician** : Doug Bogart
Test Package : MOB 2 (Additional Tests: PrtCount)

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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