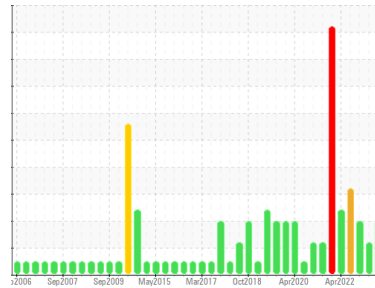




OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL



Machine Id
FREIGHTLINER 2-138
 Component
Diesel Engine
 Fluid
DIESEL ENGINE OIL SAE 15W40 (46 QTS)

DIAGNOSIS

Recommendation

We advise that you check for possible coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core).

Contamination

Sodium and/or potassium levels are high.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	WC0337176	WC0723809	WC0337182
Sample Date	Client Info	20 Dec 2022	21 Oct 2022	28 Aug 2022
Machine Age	hrs	39132	38721	38333
Oil Age	hrs	809	378	763
Oil Changed	Client Info	Changed	Changed	Changed
Sample Status		ABNORMAL	ABNORMAL	ABNORMAL

CONTAMINATION

method	limit/base	current	history1	history2
Fuel	WC Method >5	<1.0	<1.0	<1.0
Water	WC Method >0.2	NEG	NEG	NEG

WEAR METALS

method	limit/base	current	history1	history2
Iron	ppm ASTM D5185m >100	16	10	13
Chromium	ppm ASTM D5185m >20	<1	<1	<1
Nickel	ppm ASTM D5185m >2	<1	0	<1
Titanium	ppm ASTM D5185m >2	<1	<1	<1
Silver	ppm ASTM D5185m >2	<1	0	0
Aluminum	ppm ASTM D5185m >25	1	1	<1
Lead	ppm ASTM D5185m >40	2	<1	8
Copper	ppm ASTM D5185m >330	▲ 605	146	▲ 442
Tin	ppm ASTM D5185m >15	<1	<1	1
Vanadium	ppm ASTM D5185m	<1	<1	<1
Cadmium	ppm ASTM D5185m	0	0	0

ADDITIVES

method	limit/base	current	history1	history2
Boron	ppm ASTM D5185m 250	15	26	23
Barium	ppm ASTM D5185m 10	0	<1	0
Molybdenum	ppm ASTM D5185m 100	47	37	43
Manganese	ppm ASTM D5185m	<1	<1	<1
Magnesium	ppm ASTM D5185m 450	894	795	858
Calcium	ppm ASTM D5185m 3000	998	1097	1119
Phosphorus	ppm ASTM D5185m 1150	886	831	964
Zinc	ppm ASTM D5185m 1350	1081	992	1068
Sulfur	ppm ASTM D5185m 4250	3787	3215	3535

CONTAMINANTS

method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185m >25	3	4	5
Sodium	ppm ASTM D5185m >158	38	32	44
Potassium	ppm ASTM D5185m >20	▲ 154	▲ 119	▲ 173
Glycol	% *ASTM D2982	NEG	NEG	NEG

INFRA-RED

method	limit/base	current	history1	history2
Soot %	% *ASTM D7844 >3	0.2	0.1	0.1
Nitration	Abs/cm *ASTM D7624 >20	10.8	9.7	11.0
Sulfation	Abs/.1mm *ASTM D7415 >30	19.9	20.8	21.4

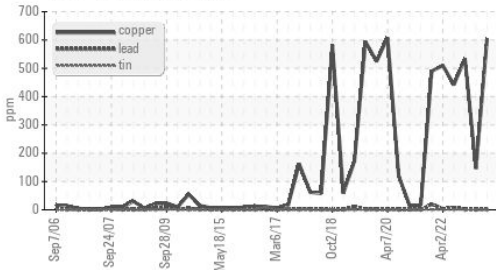
FLUID DEGRADATION

method	limit/base	current	history1	history2
Oxidation	Abs/.1mm *ASTM D7414 >25	18.3	16.2	17.6
Base Number (BN)	mg KOH/g ASTM D2896 8.5	7.6	10.6	9.6

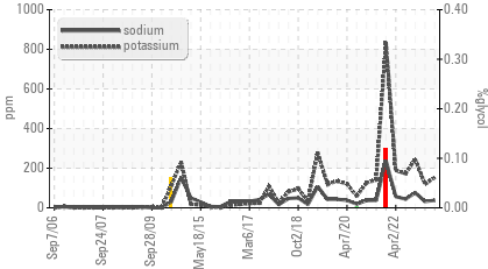


OIL ANALYSIS REPORT

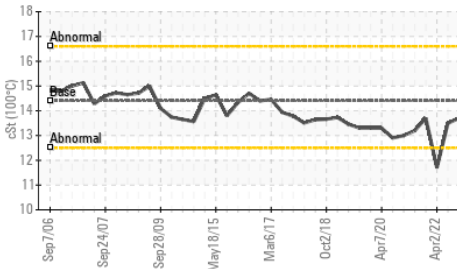
▲ Non-ferrous Metals



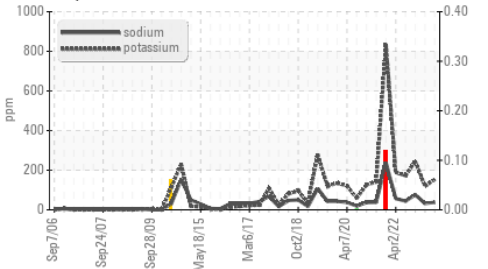
Glycol Contamination



Viscosity @ 100°C



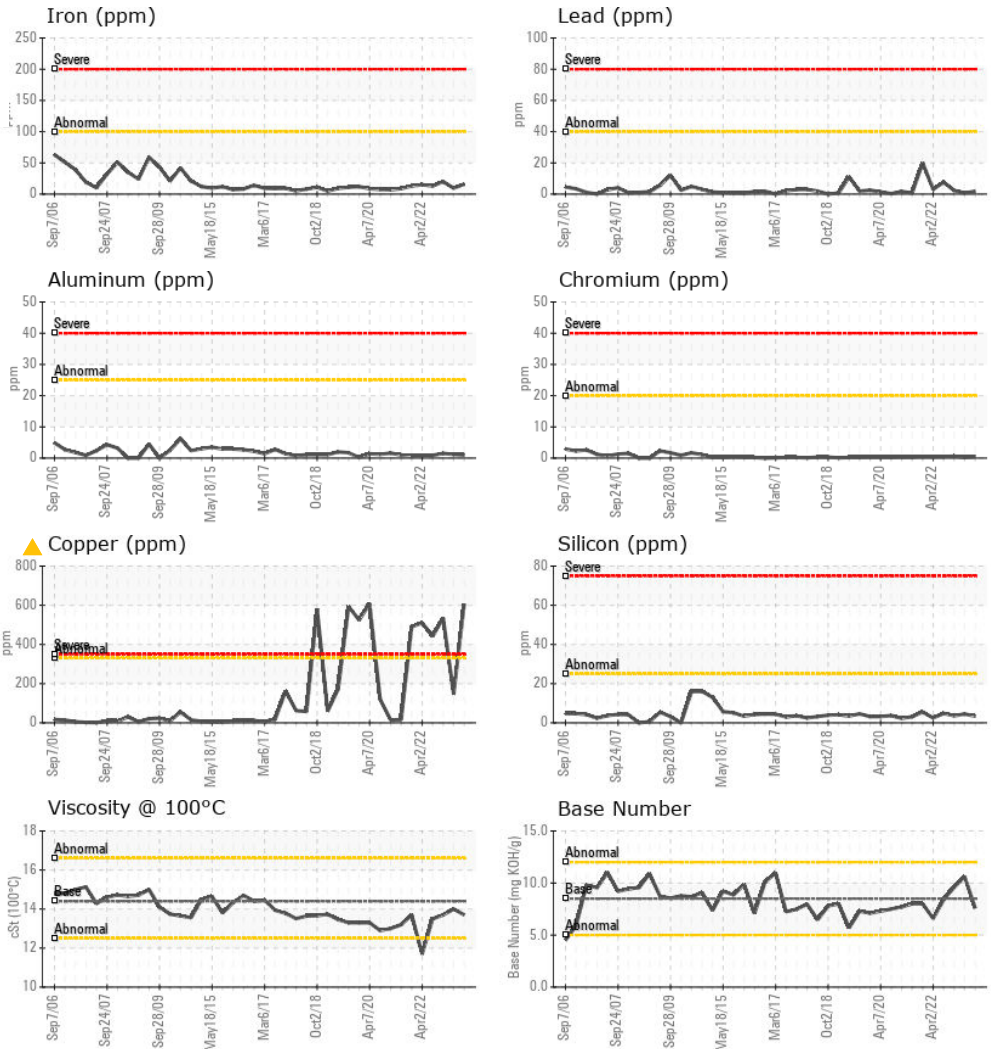
Glycol Contamination



VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.7	14.0

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0337176 **Received** : 23 Jan 2023
Lab Number : 05746000 **Diagnosed** : 24 Jan 2023
Unique Number : 10305604 **Diagnostician** : Jonathan Hester
Test Package : MOB 1 (Additional Tests: Glycol, TBN)

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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