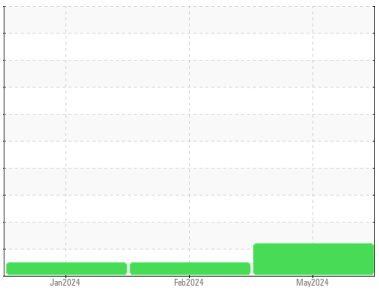
OIL ANALYSIS REPORT

Sample Rating Trend



FUEL

Machine Id
FREIGHTLINER CASCADIA 2129
Component
Diesel Engine
Fluid
MOBIL 15W40 (--- GAL)

DIAGNOSIS

Recommendation
We advise that you check all areas where contaminants can enter the system. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. The oil change at the time of sampling has been noted. Resample at the next service interval to monitor. No other corrective action is recommended at this time.

Wear
Metal levels are typical for a new component breaking in.

Contamination
Calcium and/or magnesium levels higher than normal indicating possible contamination with cement dust, advise investigate. Light fuel dilution occurring. No other contaminants were detected in the oil.

Fluid Condition
Calcium ppm levels are abnormally high. 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		**WC0917056**	WC0909265	WC0893852
Sample Date		Client Info		**22 May 2024**	29 Feb 2024	24 Jan 2024
Machine Age	mls	Client Info		**59720**	346879	340699
Oil Age	mls	Client Info		**0**	0	0
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**ABNORMAL**	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
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	>80	**16**	7	12
Chromium	ppm	ASTM D5185m	>5	**<1**	<1	1
Nickel	ppm	ASTM D5185m	>2	**0**	0	0
Titanium	ppm	ASTM D5185m		**0**	0	<1
Silver	ppm	ASTM D5185m	>3	**0**	0	0
Aluminum	ppm	ASTM D5185m	>30	**2**	<1	2
Lead	ppm	ASTM D5185m	>30	**3**	2	2
Copper	ppm	ASTM D5185m	>150	**<1**	<1	0
Tin	ppm	ASTM D5185m	>5	**<1**	<1	<1
Vanadium	ppm	ASTM D5185m		**0**	<1	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**2**	3	4
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**58**	54	57
Manganese	ppm	ASTM D5185m		**0**	0	<1
Magnesium	ppm	ASTM D5185m		**909**	894	913
Calcium	ppm	ASTM D5185m		▲ **1022**	1030	1023
Phosphorus	ppm	ASTM D5185m		**1091**	933	1029
Zinc	ppm	ASTM D5185m		**1235**	1097	1204
Sulfur	ppm	ASTM D5185m		**3025**	3352	2890

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	**3**	3	6
Sodium	ppm	ASTM D5185m	>118	**0**	3	1
Potassium	ppm	ASTM D5185m	>20	**2**	0	0
Fuel	%	ASTM D3524	>5	▲ **3.4**	<1.0	<1.0

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**0.7**	0.4	0.4
Nitration	Abs/cm	*ASTM D7624	>20	**7.4**	6.1	6.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	**19.1**	18.1	18.5

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**13.9**	13.8	14.0
Base Number (BN)	mg KOH/g	ASTM D2896		**8.4**	8.5	8.5

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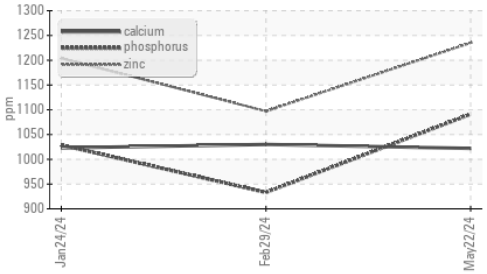
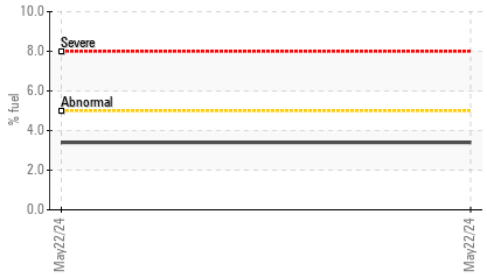
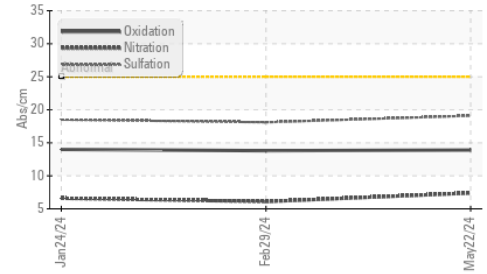
Additives



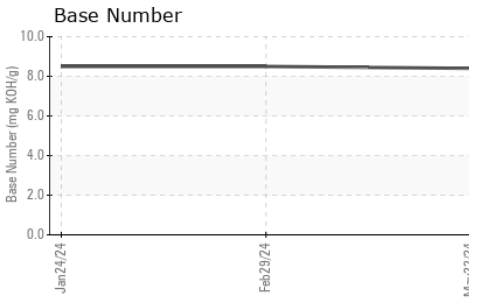
Fuel Dilution



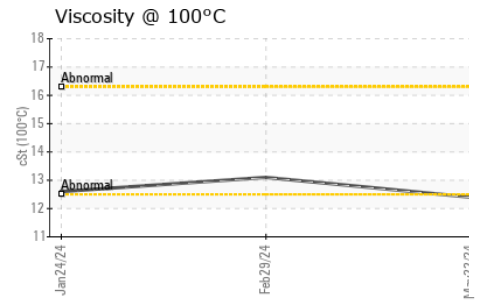
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

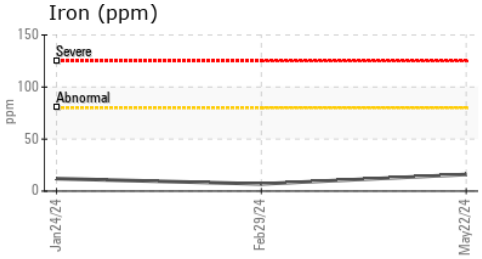


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

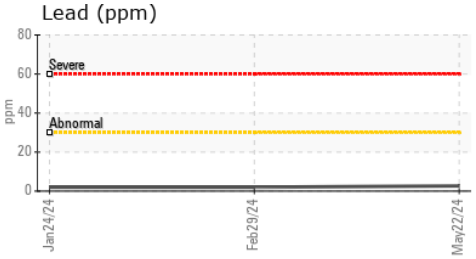
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		**12.4**	13.1	12.6

GRAPHS

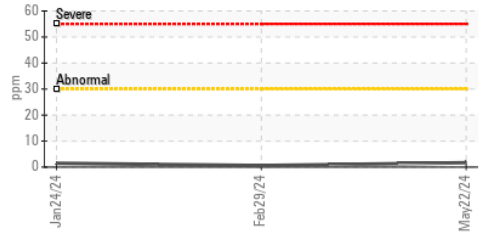
Iron (ppm)



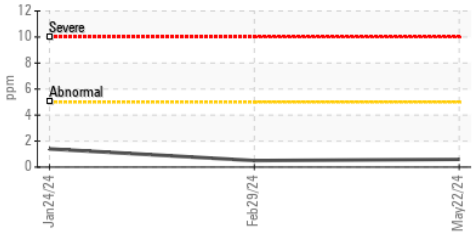
Lead (ppm)



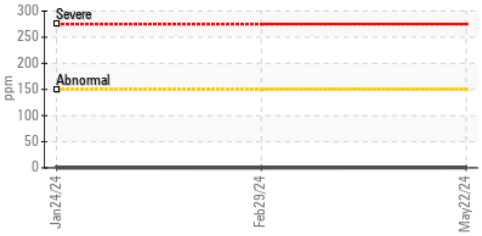
Aluminum (ppm)



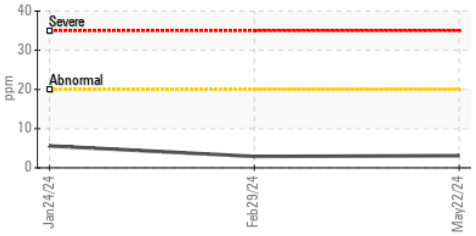
Chromium (ppm)



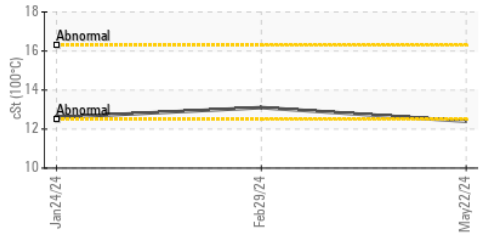
Copper (ppm)



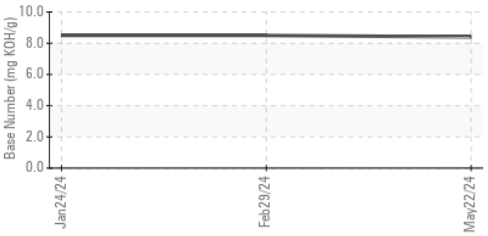
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0917056 **Received** : 19 Jun 2024
Lab Number : 06214251 **Tested** : 21 Jun 2024
Unique Number : 11087115 **Diagnosed** : 21 Jun 2024 - Wes Davis
Test Package : MOB 1 (Additional Tests: FuelDilution, PercentFuel, 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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