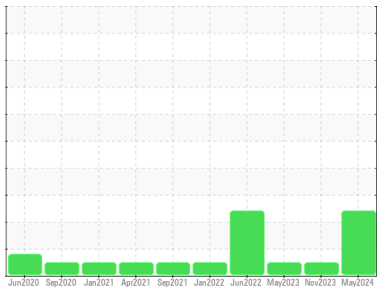
OIL ANALYSIS REPORT

Sample Rating Trend



DIRT

Area
DUMP TRUCK
Machine Id
FREIGHTLINER V026
Component
Diesel Engine
Fluid
HIGH PERFORMANCE LUBRICANTS HDMO 15W40 (21 QTS)

DIAGNOSIS

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

Wear
Cylinder, crank, or cam shaft wear is indicated. All other component wear rates are normal.

Contamination
Elemental level of silicon (Si) above normal.

Fluid Condition
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**HPL0002275**	HPL0002297	HPL0002298
Sample Date		Client Info		**09 May 2024**	07 Nov 2023	18 May 2023
Machine Age	hrs	Client Info		**3000**	2748	2490
Oil Age	hrs	Client Info		**1000**	248	491
Oil Changed		Client Info		**Changed**	Not Changd	Not Changd
Sample Status				**ABNORMAL**	NORMAL	NORMAL

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
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>80	▲ **84**	59	43
Chromium	ppm	ASTM D5185m	>5	**3**	2	2
Nickel	ppm	ASTM D5185m	>2	**0**	<1	<1
Titanium	ppm	ASTM D5185m		**<1**	<1	0
Silver	ppm	ASTM D5185m	>3	**0**	<1	0
Aluminum	ppm	ASTM D5185m	>30	**13**	16	6
Lead	ppm	ASTM D5185m	>30	**<1**	0	<1
Copper	ppm	ASTM D5185m	>150	**14**	11	8
Tin	ppm	ASTM D5185m	>5	**0**	<1	<1
Vanadium	ppm	ASTM D5185m		**<1**	<1	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	200	**72**	111	158
Barium	ppm	ASTM D5185m		**0**	9	5
Molybdenum	ppm	ASTM D5185m	85	**719**	715	749
Manganese	ppm	ASTM D5185m		**1**	<1	<1
Magnesium	ppm	ASTM D5185m	525	**466**	431	430
Calcium	ppm	ASTM D5185m	4300	**4103**	3828	3945
Phosphorus	ppm	ASTM D5185m	1000	**882**	914	852
Zinc	ppm	ASTM D5185m	1100	**1047**	1026	1067
Sulfur	ppm	ASTM D5185m	20200	**18324**	18773	20070

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	▲ **20**	19	15
Sodium	ppm	ASTM D5185m		**10**	5	3
Potassium	ppm	ASTM D5185m	>20	**5**	7	5

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**1.6**	1.3	0.9
Nitration	Abs/cm	*ASTM D7624	>20	**16.9**	14.8	13.3
Sulfation	Abs/.1mm	*ASTM D7415	>30	**41.2**	36.8	33.1

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**28.3**	25.3	22.7
Base Number (BN)	mg KOH/g	ASTM D2896	14.5	**8.94**	10.97	11.93

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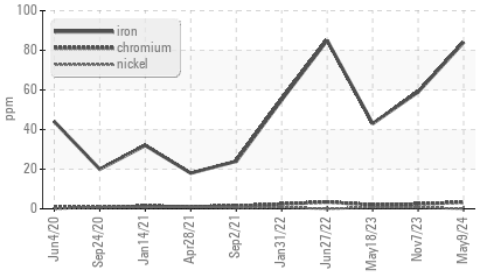
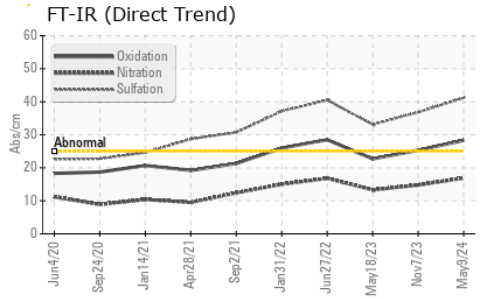
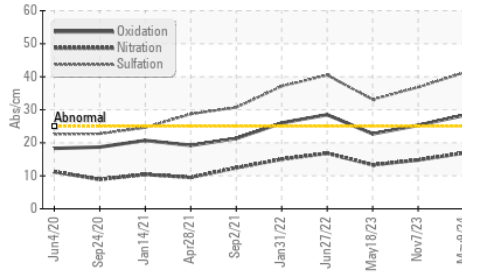
Ferrous Alloys



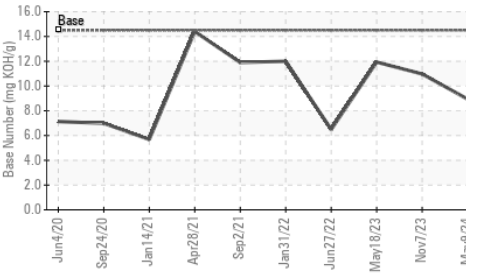
FT-IR (Direct Trend)



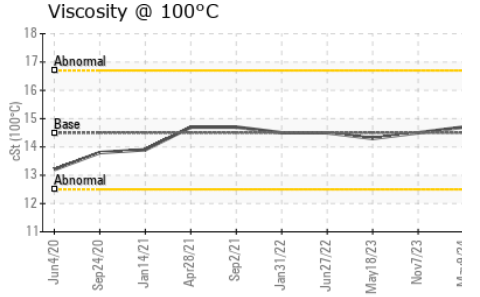
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

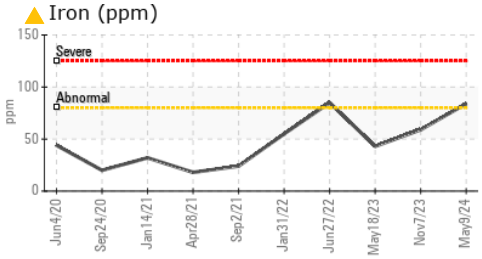


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

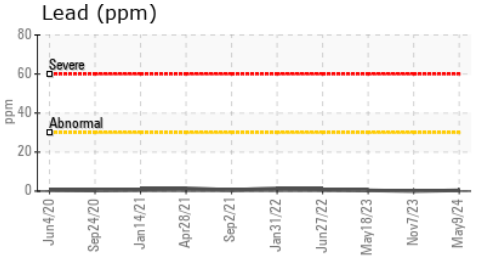
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.5	**14.7**	14.5	14.3

GRAPHS

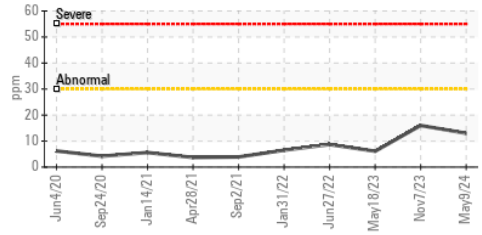
Iron (ppm)



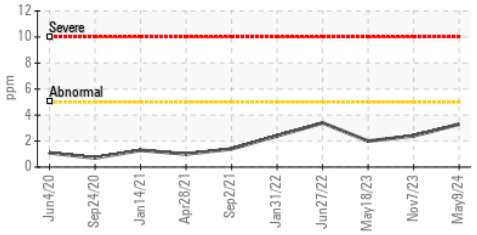
Lead (ppm)



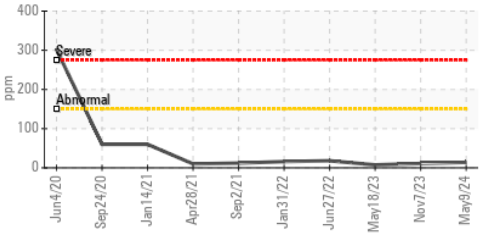
Aluminum (ppm)



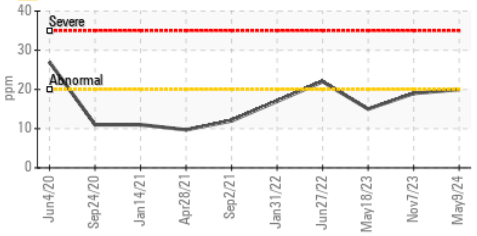
Chromium (ppm)



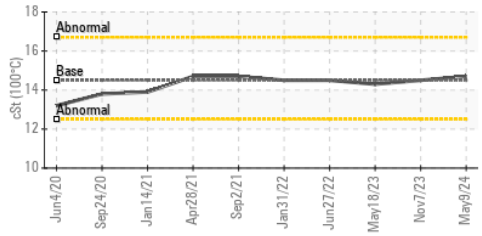
Copper (ppm)



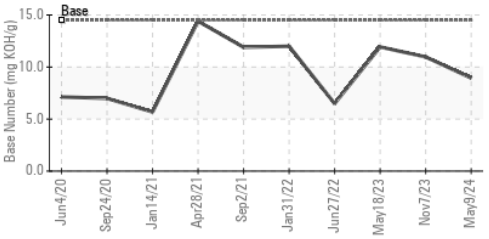
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : HPL0002275
Lab Number : 06178995
Unique Number : 11030321
Test Package : MOB 2

Received : 14 May 2024
Tested : 15 May 2024
Diagnosed : 16 May 2024 - Don Baldridge

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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