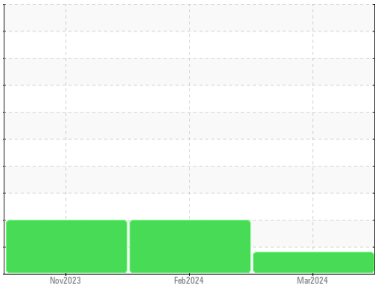
OIL ANALYSIS REPORT

Area
(BD70517) {UNASSIGNED}
Machine Id
814037 MACK LR64R
Component
Diesel Engine
Fluid
TIER ONE 15W40 (--- GAL)

Sample Rating Trend



WEAR

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
An increase in the copper level is noted. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other component wear rates are normal.

Contamination
There is no indication of any contamination in the oil.

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		**GFL0110990**	GFL0102220	GFL0061436
Sample Date		Client Info		**19 Mar 2024**	21 Feb 2024	14 Nov 2023
Machine Age	hrs	Client Info		**1078**	914	285
Oil Age	hrs	Client Info		**100**	334	281
Oil Changed		Client Info		**Changed**	Not Changd	Not Changd
Sample Status				**ATTENTION**	ABNORMAL	ABNORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	**<1.0**	<1.0	0.4
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	>120	**21**	19	27
Chromium	ppm	ASTM D5185m	>20	**2**	<1	<1
Nickel	ppm	ASTM D5185m	>5	**8**	6	9
Titanium	ppm	ASTM D5185m	>2	**3**	<1	<1
Silver	ppm	ASTM D5185m	>2	**1**	<1	<1
Aluminum	ppm	ASTM D5185m	>20	**2**	4	5
Lead	ppm	ASTM D5185m	>40	**1**	<1	0
Copper	ppm	ASTM D5185m	>330	**241**	70	31
Tin	ppm	ASTM D5185m	>15	**2**	1	1
Vanadium	ppm	ASTM D5185m		**<1**	<1	0
Cadmium	ppm	ASTM D5185m		**<1**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**16**	150	344
Barium	ppm	ASTM D5185m		**1**	0	1
Molybdenum	ppm	ASTM D5185m		**63**	81	117
Manganese	ppm	ASTM D5185m		**2**	2	3
Magnesium	ppm	ASTM D5185m		**849**	811	636
Calcium	ppm	ASTM D5185m		**1143**	1273	1364
Phosphorus	ppm	ASTM D5185m		**992**	798	651
Zinc	ppm	ASTM D5185m		**1153**	994	810
Sulfur	ppm	ASTM D5185m		**2687**	2686	2528

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	**11**	▲ 42	▲ 101
Sodium	ppm	ASTM D5185m		**2**	3	<1
Potassium	ppm	ASTM D5185m	>20	**3**	5	6

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>4	**0.5**	0.3	0.2
Nitration	Abs/cm	*ASTM D7624	>20	**8.4**	7.3	7.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	**20.1**	22.5	25.6

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**16.7**	18.0	20.8
Base Number (BN)	mg KOH/g	ASTM D2896		**7.3**	8.7	9.0

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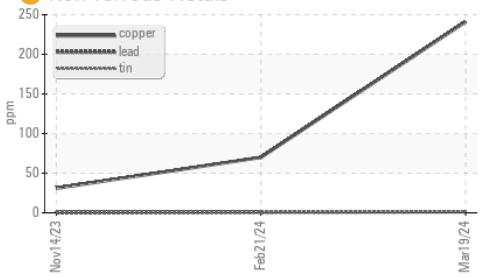
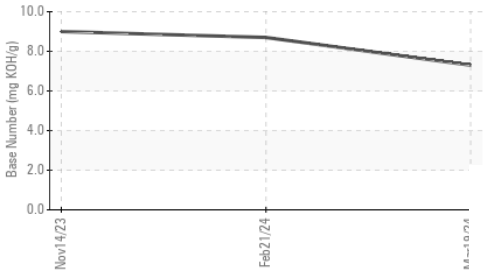
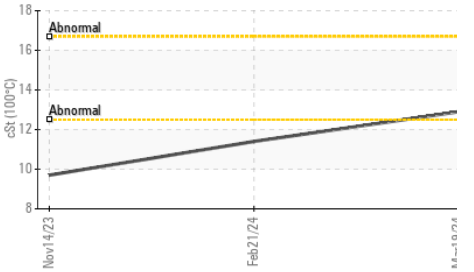
Non-ferrous Metals



Base Number



Viscosity @ 100°C

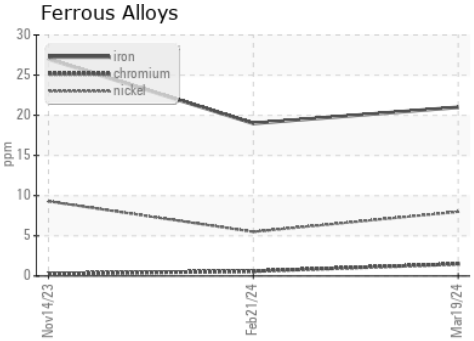


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

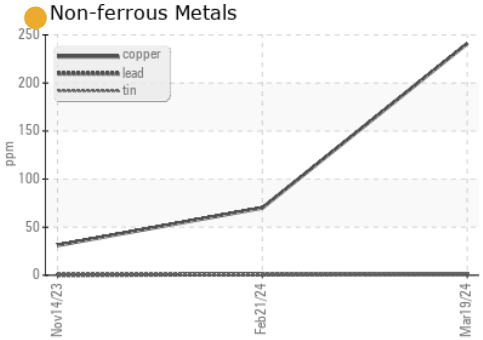
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		**12.9**	11.4	9.7

GRAPHS

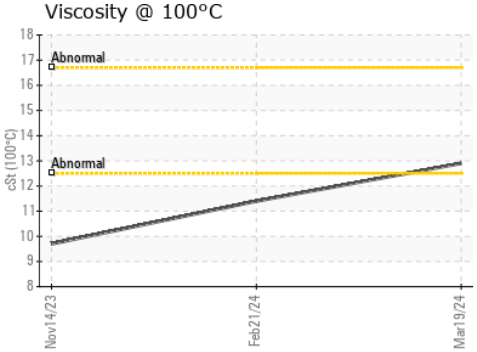
Ferrous Alloys



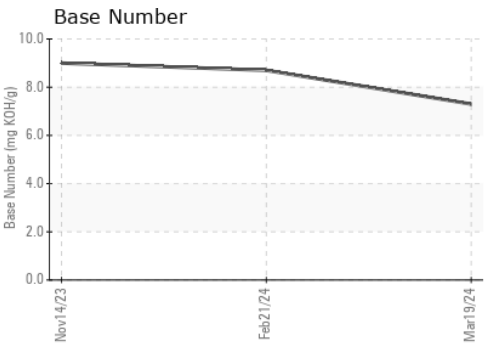
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : GFL0110990
Lab Number : 06126989
Unique Number : 10941140
Test Package : FLEET

Received : 22 Mar 2024
Tested : 25 Mar 2024
Diagnosed : 26 Mar 2024 - Sean Felton

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)

GFL Environmental - 642- Grand Rapids Hauling
5826 Alden Nash Ave SE
Lowell, MI
US 49331
Contact: Chad Crosby
ccrosby@gflenv.com
T: (616)299-8425
F: