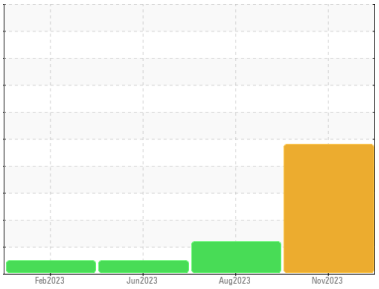
PROBLEM SUMMARY

Machine Id
424033-402093
Component
Diesel Engine
Fluid
SHELL ROTELLA T 15W40 (--- LTR)

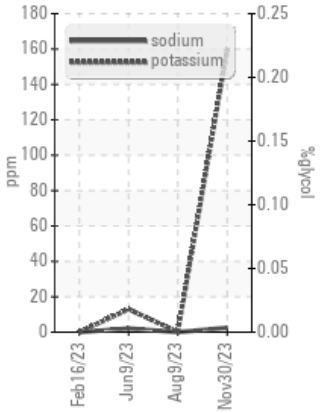
Sample Rating Trend



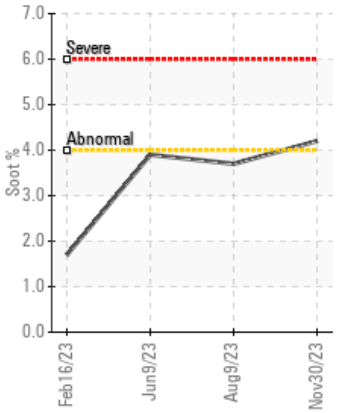
GLYCOL

COMPONENT CONDITION SUMMARY

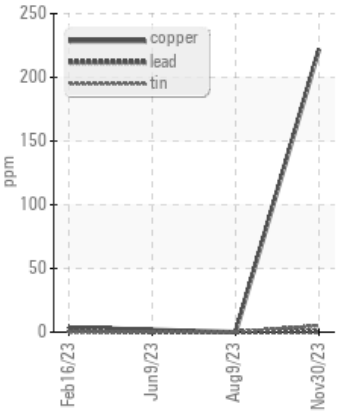
▲ Glycol Contamination



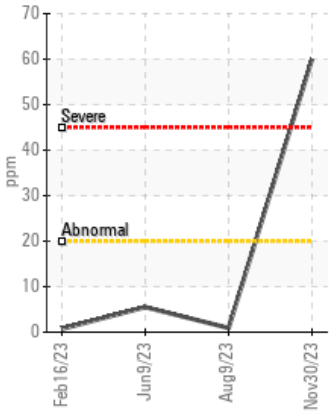
▲ Soot %



▲ Non-ferrous Metals



▲ Aluminum (ppm)



RECOMMENDATION

We advise that you check for the source of the 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.

PROBLEMATIC TEST RESULTS

Sample Status				**ABNORMAL**	ABNORMAL	NORMAL
Aluminum	ppm	ASTM D5185m	>20	▲ **60**	<1	6
Copper	ppm	ASTM D5185m	>330	▲ **222**	0	2
Potassium	ppm	ASTM D5185m	>20	▲ **159**	0	13
Soot %	%	*ASTM D7844	>4	▲ **4.2**	3.7	3.9
Base Number (BN)	mg KOH/g	ASTM D2896	10.1	▲ **3.8**	▲ 1.0	5.4

Customer Id: GFL146
Sample No.: GFL0088457
Lab Number: 06027319
Test Package: FLEET

To manage this report scan the QR code

To discuss the diagnosis or test data:
Jonathan Hester +1 919-379-4092 x4092
jhester@wearcheckusa.com

To change component or sample information:
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Fluid	---	---	?	Oil and filter change at the time of sampling has been noted.
Change Filter	---	---	?	Oil and filter change at the time of sampling has been noted.
Resample	---	---	?	We recommend an early resample to monitor this condition.
Check Glycol Access	---	---	?	We advise that you check for the source of the coolant leak.

HISTORICAL DIAGNOSIS

09 Aug 2023 Diag: Jonathan Hester

DEGRADATION

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN level is low. The condition of the oil is acceptable for the time in service.

view report

09 Jun 2023 Diag: Don Baldridge

NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

view report

16 Feb 2023 Diag: Don Baldridge

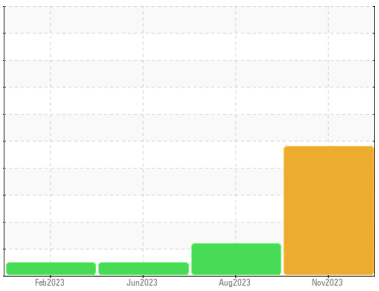
NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL

Machine Id
424033-402093
Component
Diesel Engine
Fluid
SHELL ROTELLA T 15W40 (--- LTR)

DIAGNOSIS

Recommendation
We advise that you check for the source of the 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 aluminum level is abnormal. 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. There is an abnormal amount of solids and carbon present in the oil.

Fluid Condition
The BN level is low. The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**GFL0088457**	GFL0073219	GFL0073232
Sample Date		Client Info		**30 Nov 2023**	09 Aug 2023	09 Jun 2023
Machine Age	hrs	Client Info		**32237**	31689	31223
Oil Age	hrs	Client Info		**600**	650	650
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**ABNORMAL**	ABNORMAL	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	>120	**52**	22	28
Chromium	ppm	ASTM D5185m	>20	**3**	1	<1
Nickel	ppm	ASTM D5185m	>5	**1**	0	0
Titanium	ppm	ASTM D5185m	>2	**<1**	0	<1
Silver	ppm	ASTM D5185m	>2	**<1**	0	0
Aluminum	ppm	ASTM D5185m	>20	▲ **60**	<1	6
Lead	ppm	ASTM D5185m	>40	**<1**	0	0
Copper	ppm	ASTM D5185m	>330	▲ **222**	0	2
Tin	ppm	ASTM D5185m	>15	**5**	0	<1
Vanadium	ppm	ASTM D5185m		**0**	0	<1
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	316	**36**	271	2
Barium	ppm	ASTM D5185m	0.0	**0**	0	0
Molybdenum	ppm	ASTM D5185m	1.2	**46**	78	63
Manganese	ppm	ASTM D5185m		**4**	0	<1
Magnesium	ppm	ASTM D5185m	24	**576**	423	1026
Calcium	ppm	ASTM D5185m	2292	**1687**	1491	1181
Phosphorus	ppm	ASTM D5185m	1064	**775**	1041	1077
Zinc	ppm	ASTM D5185m	1160	**962**	1362	1362
Sulfur	ppm	ASTM D5185m	4996	**2589**	4160	3973

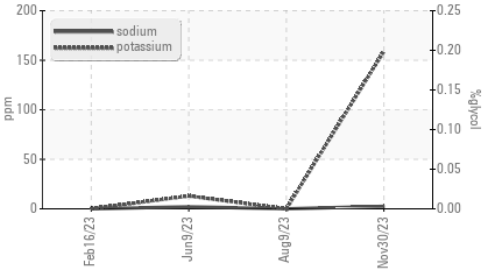
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	**8**	3	4
Sodium	ppm	ASTM D5185m		**2**	0	2
Potassium	ppm	ASTM D5185m	>20	▲ **159**	0	13
Fuel	%	ASTM D3524	>3.0	**<1.0**	<1.0	<1.0

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>4	▲ **4.2**	3.7	3.9
Nitration	Abs/cm	*ASTM D7624	>20	**11.7**	10.5	10.1
Sulfation	Abs/.1mm	*ASTM D7415	>30	**30.3**	28.5	26.6

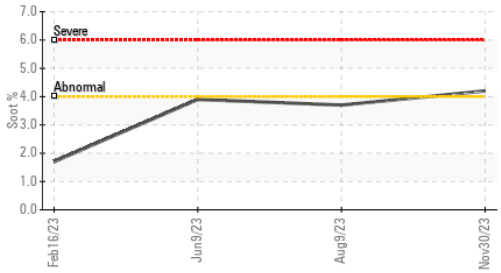
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**19.2**	17.2	14.7
Base Number (BN)	mg KOH/g	ASTM D2896	10.1	▲ **3.8**	▲ 1.0	5.4

OIL ANALYSIS REPORT

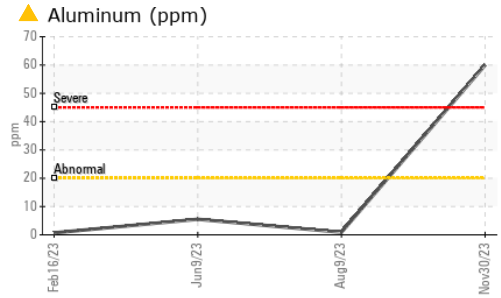
Glycol Contamination



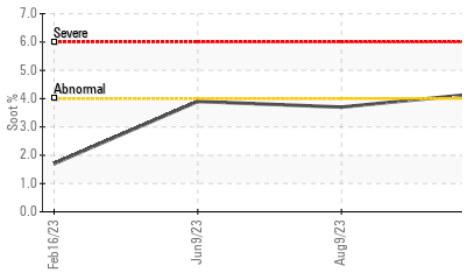
Soot %



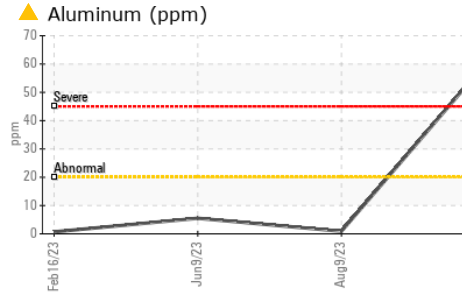
Aluminum (ppm)



Soot %



Aluminum (ppm)

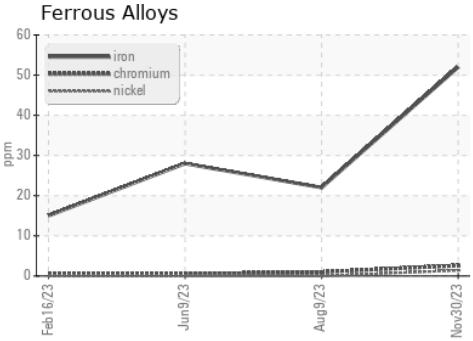


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

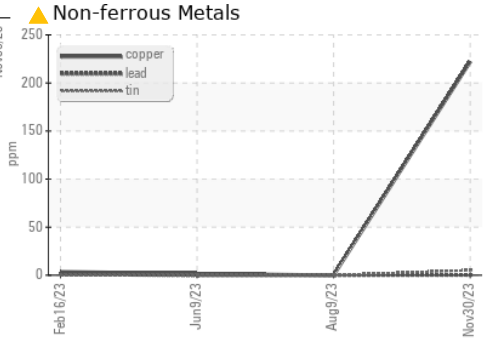
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.7	**15.4**	15.5	13.3

GRAPHS

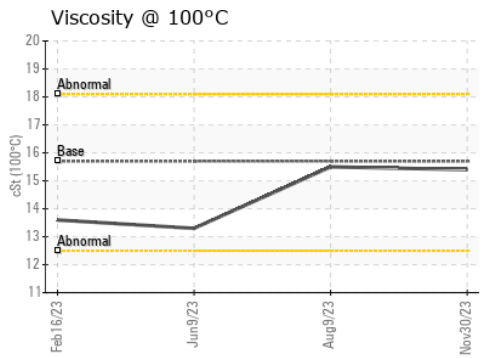
Ferrous Alloys



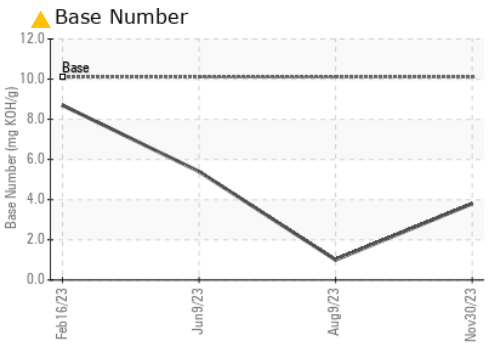
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : GFL0088457 **Received** : 07 Dec 2023
Lab Number : 06027319 **Diagnosed** : 11 Dec 2023
Unique Number : 10777110 **Diagnostician** : Jonathan Hester
Test Package : FLEET (Additional Tests: FuelDilution)

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 - 146 - Augusta
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Augusta, GA
US 30909
Contact: JEFFERY WASHINGTON
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T:
F:

Report Id: GFL146 [WUSCAR] 06027319 (Generated: 12/11/2023 08:21:44) Rev: 1

Submitted By: CHRISTOPHER FARRER