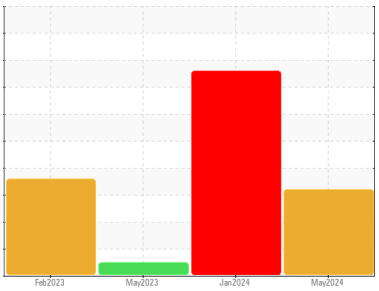
OIL ANALYSIS REPORT

Sample Rating Trend



DIRT

Machine Id
426138 - SW4614
Component
Diesel Engine
Fluid
PETRO CANADA DURON SHP 15W40 (--- GAL)

DIAGNOSIS

Recommendation
We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. (Customer Sample Comment: Engine)

Wear
Cylinder, crank, or cam shaft wear is indicated.

Contamination
Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

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		**GFL0123567**	GFL0105519	GFL0075343
Sample Date		Client Info		**23 May 2024**	18 Jan 2024	20 May 2023
Machine Age	mls	Client Info		**287726**	277220	271072
Oil Age	mls	Client Info		**287726**	277220	263966
Oil Changed		Client Info		**Changed**	N/A	Changed
Sample Status				**ABNORMAL**	SEVERE	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>5	**<1.0**	0.6	<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	>100	▲ **137**	▲ 169	26
Chromium	ppm	ASTM D5185m	>20	**7**	▲ 16	1
Nickel	ppm	ASTM D5185m	>4	**1**	1	<1
Titanium	ppm	ASTM D5185m		**<1**	2	<1
Silver	ppm	ASTM D5185m	>3	**0**	0	0
Aluminum	ppm	ASTM D5185m	>20	● **9**	● 15	3
Lead	ppm	ASTM D5185m	>40	**<1**	3	2
Copper	ppm	ASTM D5185m	>330	**125**	11	1
Tin	ppm	ASTM D5185m	>15	**<1**	<1	<1
Vanadium	ppm	ASTM D5185m		**<1**	0	<1
Cadmium	ppm	ASTM D5185m		**<1**	0	<1

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	**<1**	58	<1
Barium	ppm	ASTM D5185m	0	**3**	14	0
Molybdenum	ppm	ASTM D5185m	60	**58**	50	40
Manganese	ppm	ASTM D5185m	0	**2**	6	<1
Magnesium	ppm	ASTM D5185m	1010	**48**	450	128
Calcium	ppm	ASTM D5185m	1070	**2487**	1730	2844
Phosphorus	ppm	ASTM D5185m	1150	**1140**	1044	1078
Zinc	ppm	ASTM D5185m	1270	**1240**	1283	1359
Sulfur	ppm	ASTM D5185m	2060	**2929**	3335	3719

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	▲ **38**	▲ 84	9
Sodium	ppm	ASTM D5185m		**5**	0	<1
Potassium	ppm	ASTM D5185m	>20	**5**	6	4

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**1.7**	0.7	1.2
Nitration	Abs/cm	*ASTM D7624	>20	**11.4**	7.7	11.8
Sulfation	Abs/.1mm	*ASTM D7415	>30	**22.4**	24.6	22.7

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**13.8**	21.1	13.3
Base Number (BN)	mg KOH/g	ASTM D2896	9.8	**8.4**	11.1	8.5

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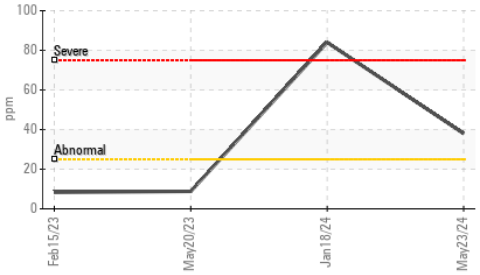
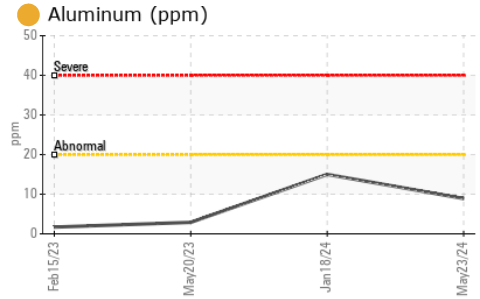
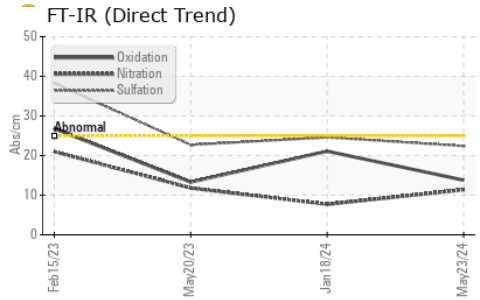
Silicon (ppm)



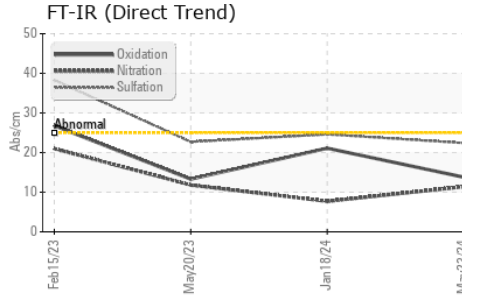
Aluminum (ppm)



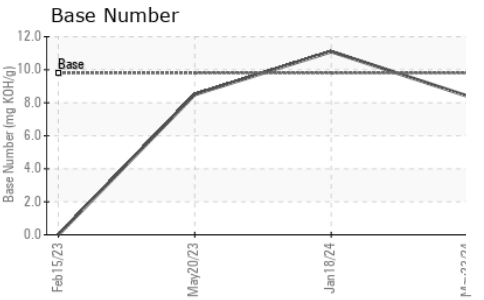
FT-IR (Direct Trend)



FT-IR (Direct Trend)



Base Number

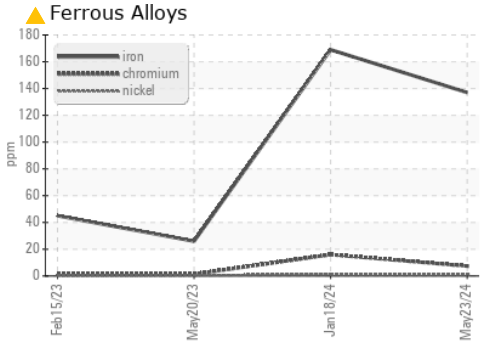


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

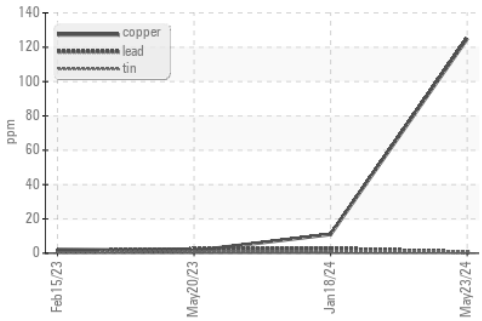
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	**13.5**	10.8	14.0

GRAPHS

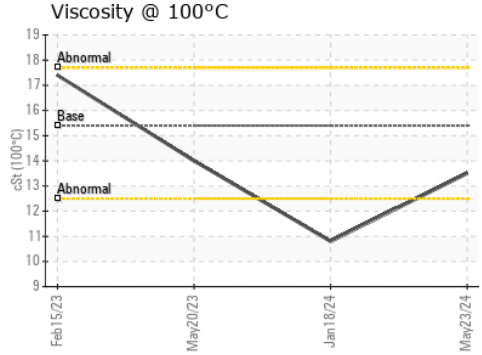
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



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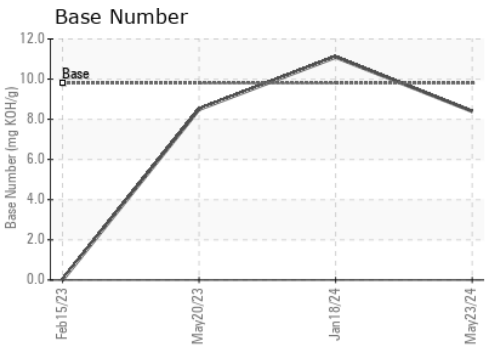

Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : GFL0123567
Lab Number : 06194998
Unique Number : 11057121
Test Package : FLEET

Received : 30 May 2024
Tested : 31 May 2024
Diagnosed : 31 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)

GFL Environmental - 983 - Sugar Land Hauling
16011 West Belfort Street
Sugar Land, TX
US 77498
Contact: Adrian Martinez
adrianmartinez@gflenv.com
T:
F: