



WEAR CHECK

OIL ANALYSIS REPORT

WEAR	ATTENTION
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Machine Id
FREIGHTLINER 45890

Component
Diesel Engine

Fluid
DIESEL ENGINE OIL SAE 15W40 (44 QTS)

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.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0891639	WC0861101	WC0826618
Sample Date		Client Info		29 Dec 2023	07 Oct 2023	20 Jul 2023
Machine Age	mls	Client Info		253360	239665	0
Oil Age	mls	Client Info		0	0	0
Filter Age	mls	Client Info		0	0	0
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>80	35	1	28
Chromium	ppm	ASTM D5185m	>5	<1	0	2
Nickel	ppm	ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>30	▲ 9	1	1
Lead	ppm	ASTM D5185m	>30	2	<1	13
Copper	ppm	ASTM D5185m	>150	4	0	7
Tin	ppm	ASTM D5185m	>5	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

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

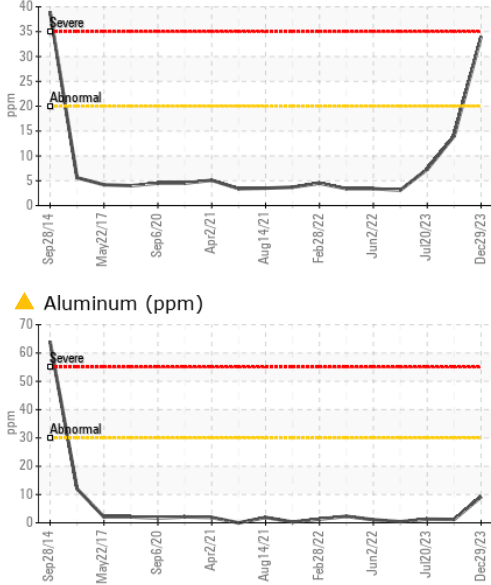
Silicon	ppm	ASTM D5185m	>20	▲ 34	14	7
Potassium	ppm	ASTM D5185m	>20	3	2	0
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	0.4	0.1	0.6
Nitration	Abs/cm	*ASTM D7624	>20	8.2	5.5	11.9
Sulfation	Abs/.1mm	*ASTM D7415	>30	22.0	18.5	25.9
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

FLUID CONDITION

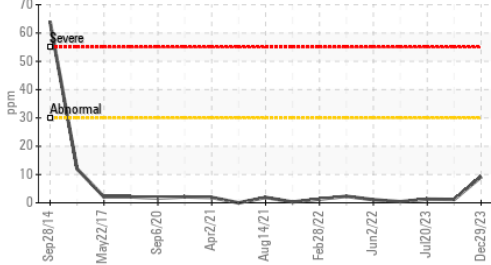
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

Sodium	ppm	ASTM D5185m	>158	0	1	2
Boron	ppm	ASTM D5185m	250	228	2	0
Barium	ppm	ASTM D5185m	10	0	0	0
Molybdenum	ppm	ASTM D5185m	100	84	54	73
Manganese	ppm	ASTM D5185m		0	<1	<1
Magnesium	ppm	ASTM D5185m	450	609	915	1151
Calcium	ppm	ASTM D5185m	3000	1362	999	1254
Phosphorus	ppm	ASTM D5185m	1150	1096	1079	1141
Zinc	ppm	ASTM D5185m	1350	1306	1202	1395
Sulfur	ppm	ASTM D5185m	4250	3491	3296	3626
Oxidation	Abs/.1mm	*ASTM D7414	>25	17.4	14.1	23.2
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	7.2	10.4	7.6
Visc @ 100°C	cSt	ASTM D445	14.4	13.4	13.5	14.6

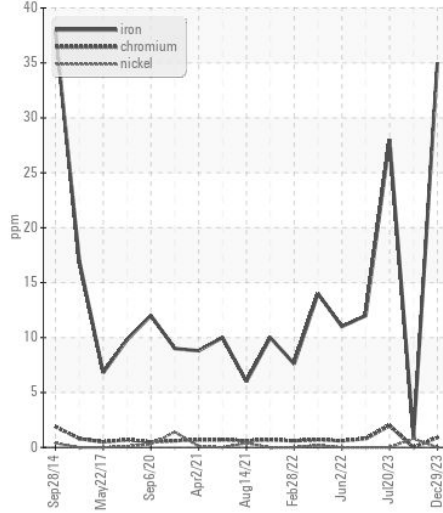
▲ Silicon (ppm)



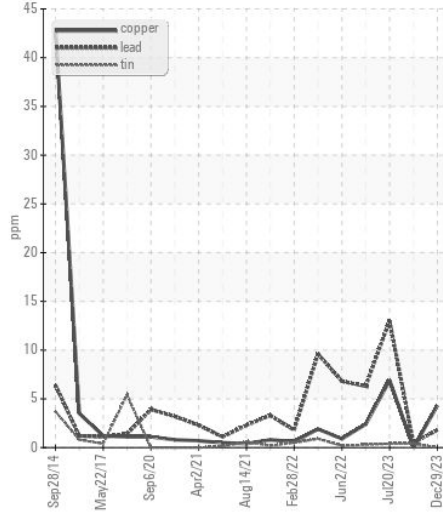
▲ Aluminum (ppm)



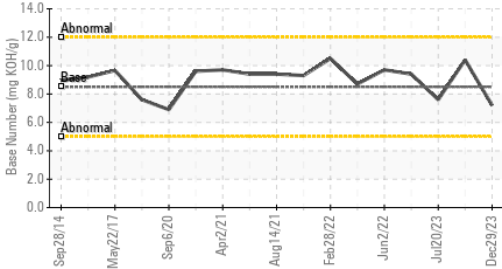
Ferrous Alloys



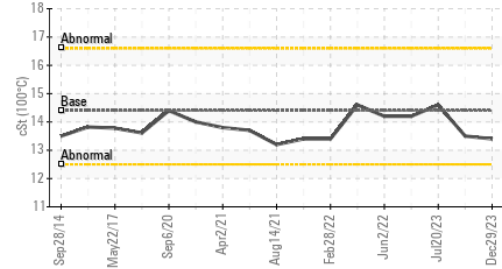
Non-ferrous Metals



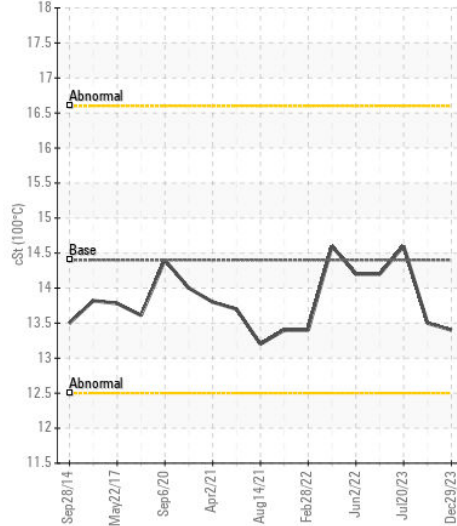
Base Number



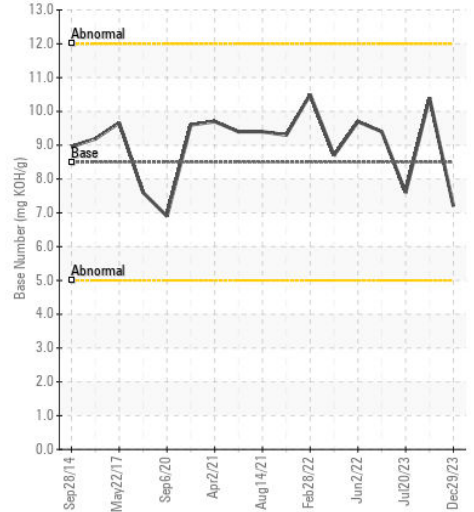
Viscosity @ 100°C



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0891639 **Received** : 12 Jan 2024
Lab Number : 06059934 **Diagnosed** : 16 Jan 2024
Unique Number : 10831316 **Diagnostician** : Don Baldrige
Test Package : FLEET

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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)