



OIL ANALYSIS REPORT

WEAR	SEVERE
CONTAMINATION	SEVERE
FLUID CONDITION	NORMAL



Machine Id
LIEBHERR A934C-HD-LI C-48 (S/N 045988-1007)
 Component
Diesel Engine
 Fluid
CONOCO PHILLIPS GUARDOL ECT 15W40 (8 GAL)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0920307	WC0920331	WC0849435
Sample Date		Client Info		18 Jun 2024	03 May 2024	20 Oct 2023
Machine Age	hrs	Client Info		41767	25855	25439
Oil Age	hrs	Client Info		0	416	348
Filter Age	hrs	Client Info		0	416	348
Oil Changed		Client Info		Not Chngd	N/A	Changed
Filter Changed		Client Info		Not Chngd	N/A	Changed
Sample Status				SEVERE	NORMAL	NORMAL

WEAR

The aluminum level is severe. Piston wear is indicated. High wear metal levels reflect the reported failure.

Iron	ppm	ASTM D5185m	>66	40	6	6
Chromium	ppm	ASTM D5185m	>4	<1	0	<1
Nickel	ppm	ASTM D5185m	>4	1	0	0
Titanium	ppm	ASTM D5185m		80	80	34
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>8	▲ 65	1	2
Lead	ppm	ASTM D5185m	>10	4	0	<1
Copper	ppm	ASTM D5185m	>74	6	<1	1
Tin	ppm	ASTM D5185m	>4	2	0	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
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.

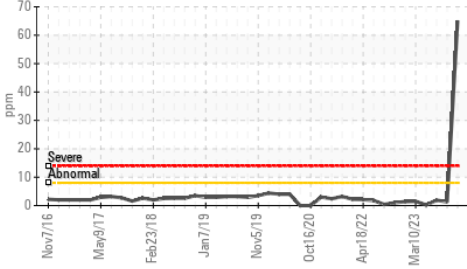
Silicon	ppm	ASTM D5185m	>15	▲ 25	8	9
Potassium	ppm	ASTM D5185m	>20	3	2	3
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	0.3	1	0.8
Nitration	Abs/cm	*ASTM D7624	>20	7.0	9.3	7.7
Sulfation	Abs/.1mm	*ASTM D7415	>30	20.5	21.6	20.5
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

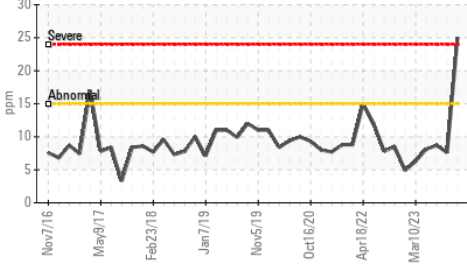
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Sodium	ppm	ASTM D5185m		2	2	0
Boron	ppm	ASTM D5185m	85	126	83	37
Barium	ppm	ASTM D5185m		0	0	3
Molybdenum	ppm	ASTM D5185m		0	9	44
Manganese	ppm	ASTM D5185m		<1	<1	0
Magnesium	ppm	ASTM D5185m	350	393	496	786
Calcium	ppm	ASTM D5185m	1800	1761	1888	1339
Phosphorus	ppm	ASTM D5185m	1000	994	1057	1112
Zinc	ppm	ASTM D5185m	1100	1203	1285	1245
Sulfur	ppm	ASTM D5185m	3500	4435	4375	3589
Oxidation	Abs/.1mm	*ASTM D7414	>25	15.1	15.9	14.9
Base Number (BN)	mg KOH/g	ASTM D2896	9.5	8.7	6.6	8.3
Visc @ 100°C	cSt	ASTM D445	15.3	14.9	14.4	14.6

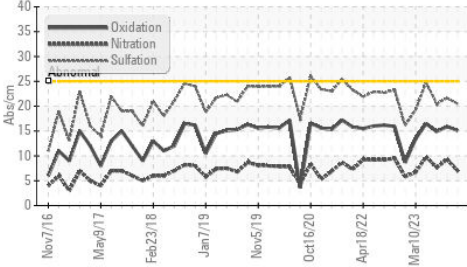
▲ Aluminum (ppm)



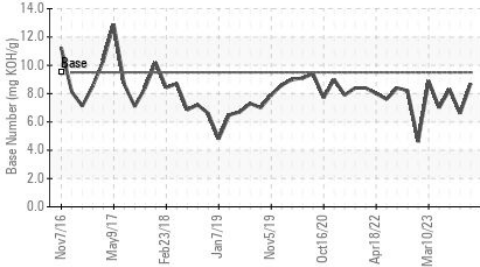
▲ Silicon (ppm)



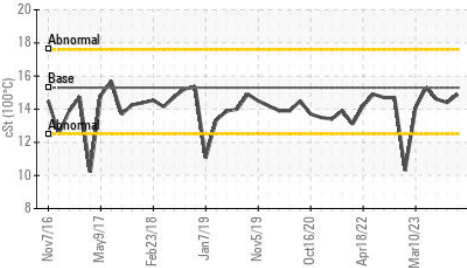
FT-IR (Direct Trend)



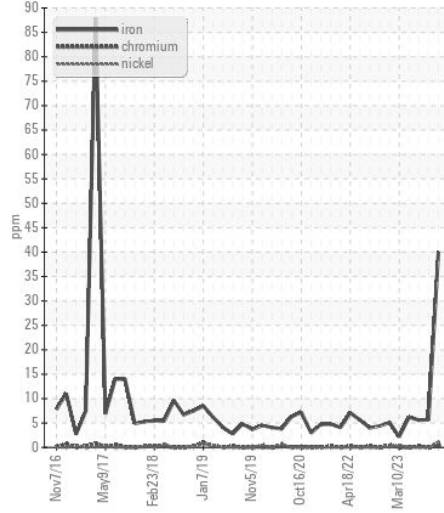
Base Number



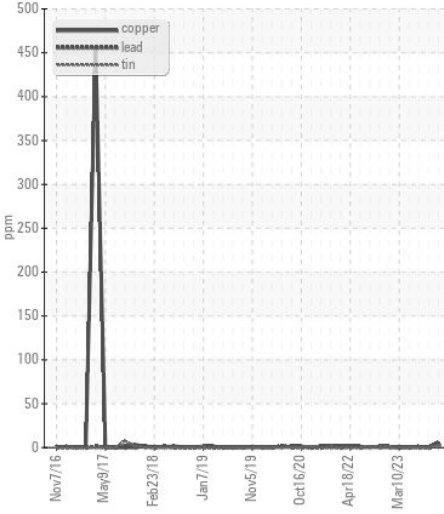
Viscosity @ 100°C



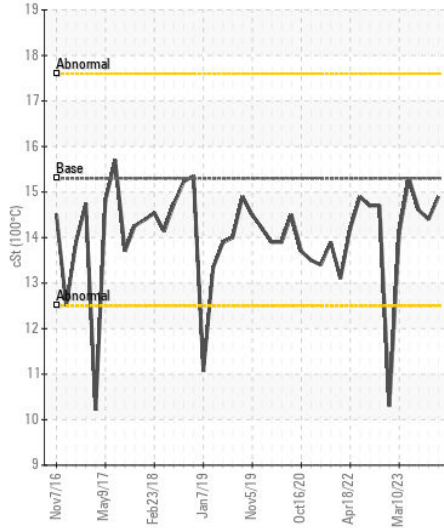
Ferrous Alloys



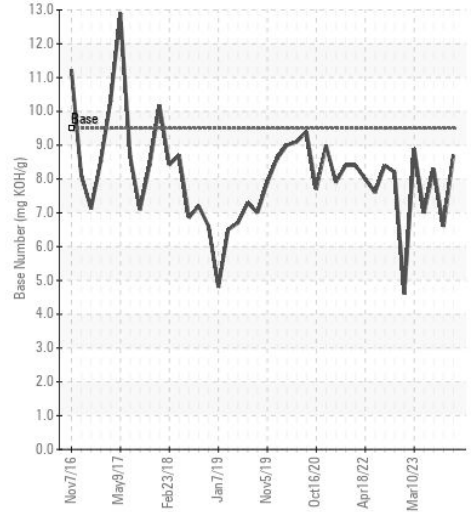
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0920307 **Received** : 27 Jun 2024
Lab Number : 06222146 **Tested** : 28 Jun 2024
Unique Number : 11100343 **Diagnosed** : 01 Jul 2024 - Jonathan Hester
Test Package : CONST (Additional Tests: TBN)

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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)