



TRAAP

Texas Refinery Advanced Analysis Program

OIL ANALYSIS REPORT

WEAR	ABNORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
LIEBHERR LTM 1045 62 (S/N 053607)
 Component
Diesel Engine
 Fluid
TRC MOLY XL PRO-SPEC IV XP 15W40 (9 GAL)

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.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		TR06152668	TR05898220	TR05721526
Sample Date		Client Info		08 Apr 2024	05 Jul 2023	29 Nov 2022
Machine Age	hrs	Client Info		17934	17602	17300
Oil Age	hrs	Client Info		650	300	500
Filter Age	hrs	Client Info		350	300	250
Oil Changed		Client Info		Changed	Not Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	NORMAL	NORMAL

WEAR

The aluminum level is abnormal. All other component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	43	25	15
Chromium	ppm	ASTM D5185m	>5	2	1	<1
Nickel	ppm	ASTM D5185m	>5	0	0	0
Titanium	ppm	ASTM D5185m		<1	<1	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>15	▲ 22	15	6
Lead	ppm	ASTM D5185m	>30	3	2	5
Copper	ppm	ASTM D5185m	>125	39	12	49
Tin	ppm	ASTM D5185m	>5	2	<1	1
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

There is no indication of any contamination in the oil.

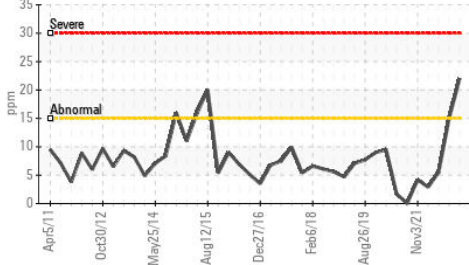
Silicon	ppm	ASTM D5185m	>60	15	11	9
Potassium	ppm	ASTM D5185m	>20	3	3	0
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	1.8	1	0.3
Nitration	Abs/cm	*ASTM D7624	>20	9.5	9.0	8.8
Sulfation	Abs/.1mm	*ASTM D7415	>30	20.4	18.6	18.1
Silt	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

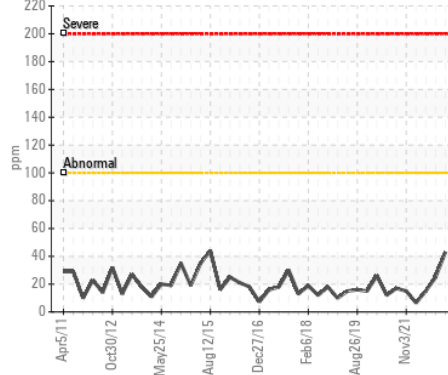
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		6	2	2
Boron	ppm	ASTM D5185m		3	6	9
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		145	146	147
Manganese	ppm	ASTM D5185m		1	<1	<1
Magnesium	ppm	ASTM D5185m		17	26	22
Calcium	ppm	ASTM D5185m		3961	4329	4535
Phosphorus	ppm	ASTM D5185m		918	946	968
Zinc	ppm	ASTM D5185m		1028	1133	1079
Sulfur	ppm	ASTM D5185m		4865	5428	5200
Oxidation	Abs/.1mm	*ASTM D7414	>25	9.5	9.5	10.0
Base Number (BN)	mg KOH/g	ASTM D2896		13.80	16.35	13.56
Visc @ 100°C	cSt	ASTM D445		15.1	15.2	15.0

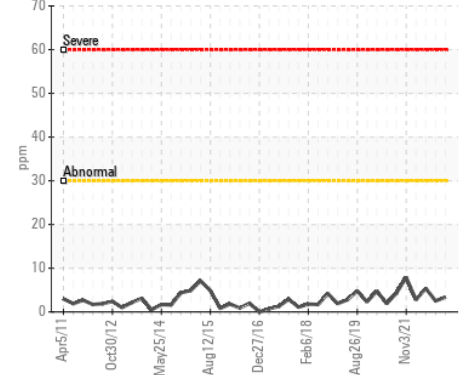
▲ Aluminum (ppm)



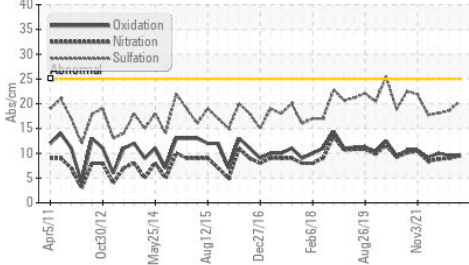
Iron (ppm)



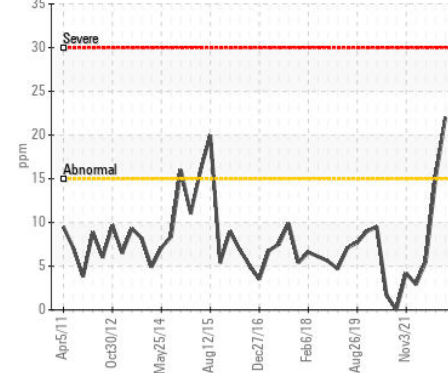
Lead (ppm)



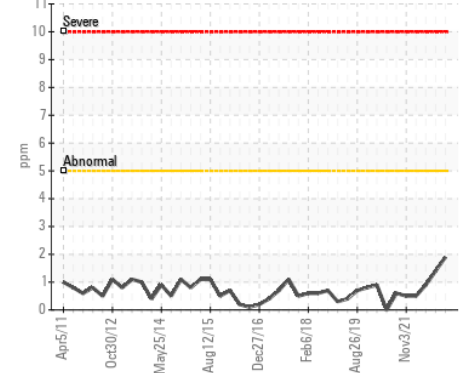
FT-IR (Direct Trend)



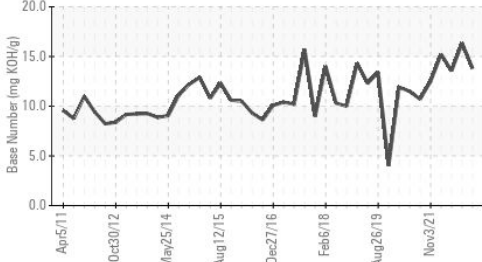
▲ Aluminum (ppm)



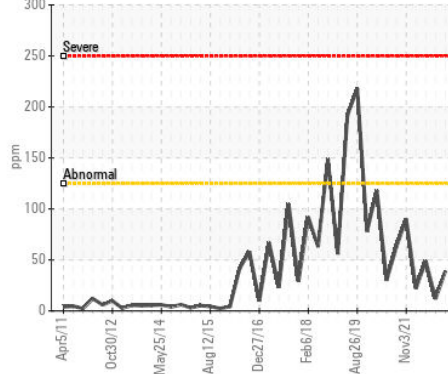
Chromium (ppm)



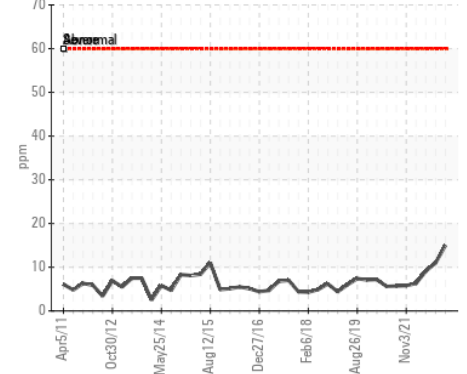
Base Number



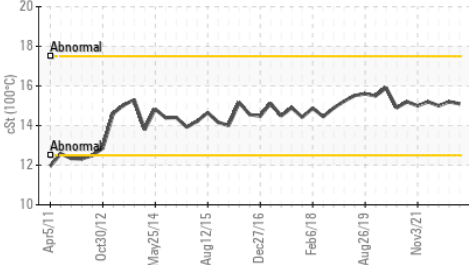
Copper (ppm)



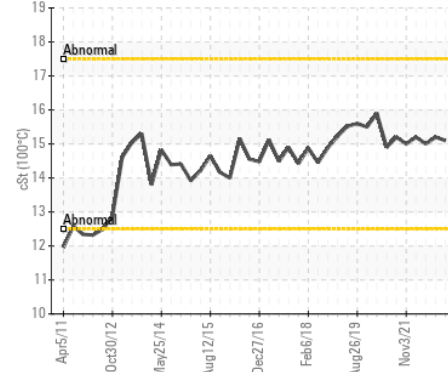
Silicon (ppm)



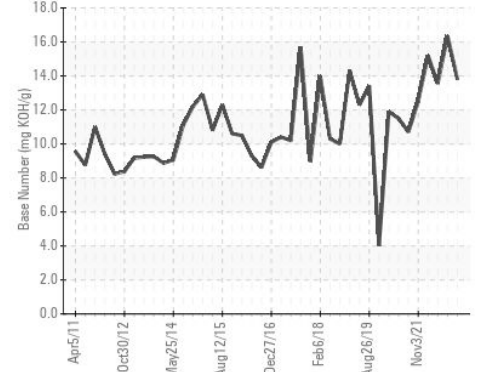
Viscosity @ 100°C



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : TR06152668

Lab Number : 06152668

Unique Number : 10982746

Test Package : MOB 2

Received : 17 Apr 2024

Tested : 19 Apr 2024

Diagnosed : 22 Apr 2024 - Sean Felton

Doug Doll D's Trees

7657 Tidwell Road

Pace, FL

US 32571

Contact: Service Manager

To discuss this sample report, contact Customer Service at 1-800-827-0711.

* - 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)

T:

F: