



TRAAP

Texas Refinery Advanced Analysis Program

OIL ANALYSIS REPORT

WEAR	ABNORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	ABNORMAL

Machine Id
LIEBHERR 676
 Component
Upper Diesel Engine
 Fluid
TRC MOLY XL PRO-SPEC IV 15W40 (12 GAL)

RECOMMENDATION

We advise that you check for possible 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.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		TR06158506	TR05916260	---
Sample Date		Client Info		29 Aug 2023	07 Jun 2023	---
Machine Age	hrs	Client Info		911	670	---
Oil Age	hrs	Client Info		500	250	---
Filter Age	hrs	Client Info		250	250	---
Oil Changed		Client Info		Changed	Not Changed	---
Filter Changed		Client Info		Changed	Changed	---
Sample Status				ABNORMAL	NORMAL	---

WEAR

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).

Iron	ppm	ASTM D5185m	>100	8	3	---
Chromium	ppm	ASTM D5185m	>5	0	<1	---
Nickel	ppm	ASTM D5185m	>5	0	0	---
Titanium	ppm	ASTM D5185m		0	<1	---
Silver	ppm	ASTM D5185m	>3	0	0	---
Aluminum	ppm	ASTM D5185m	>15	2	1	---
Lead	ppm	ASTM D5185m	>30	2	<1	---
Copper	ppm	ASTM D5185m	>125	▲ 147	11	---
Tin	ppm	ASTM D5185m	>5	<1	<1	---
Vanadium	ppm	ASTM D5185m		0	<1	---
White Metal	scalar	*Visual	NONE	NONE	NONE	---
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	---

CONTAMINATION

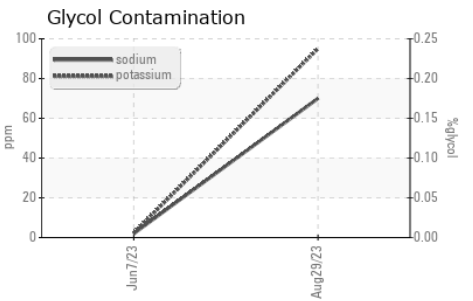
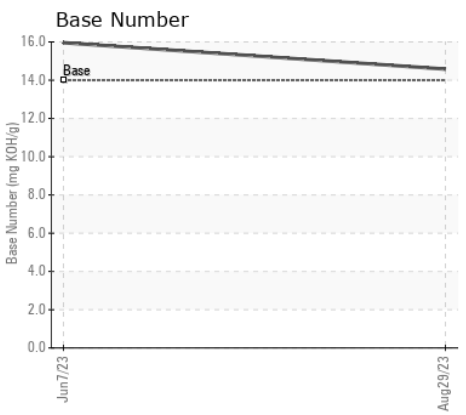
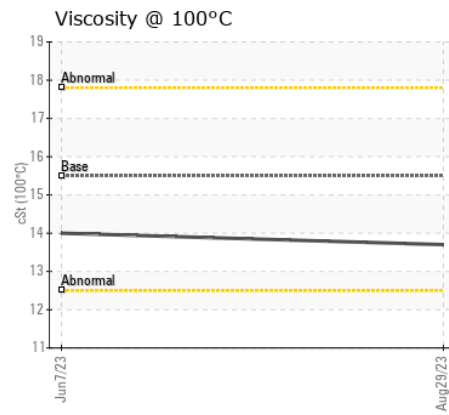
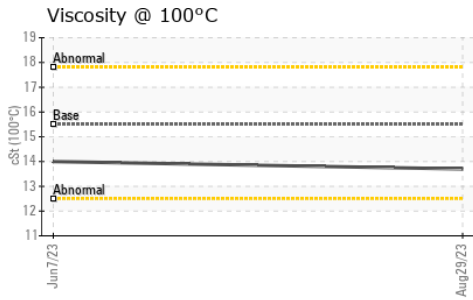
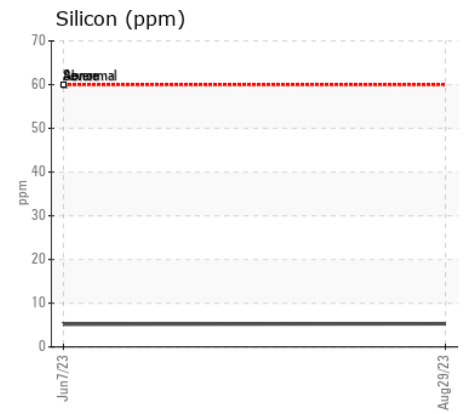
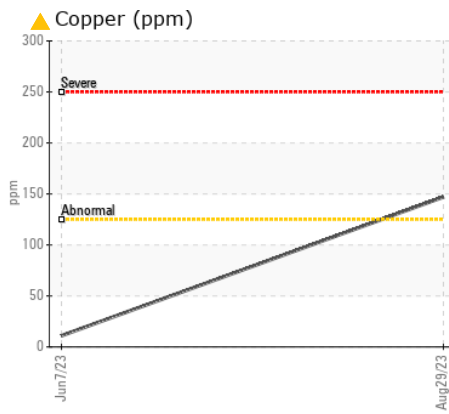
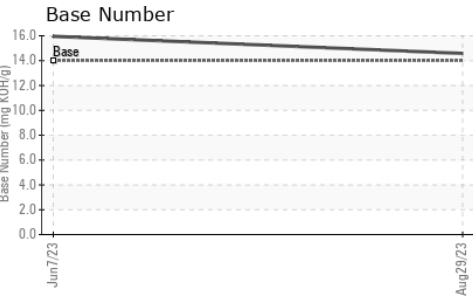
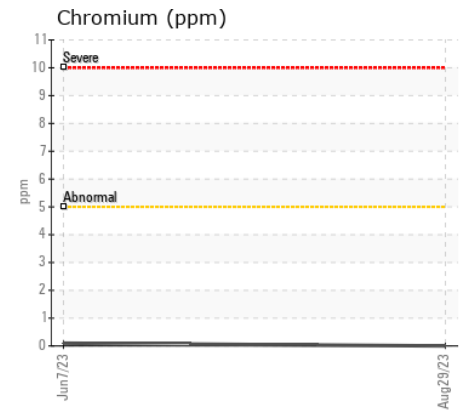
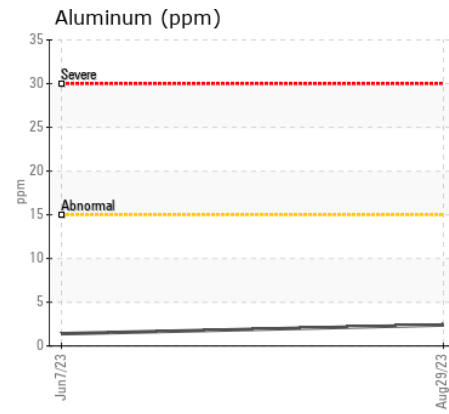
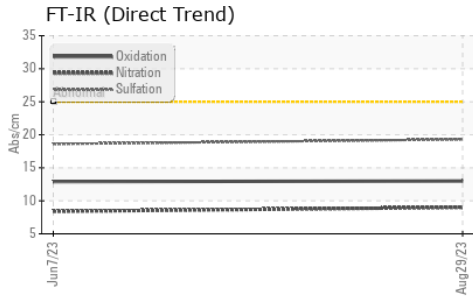
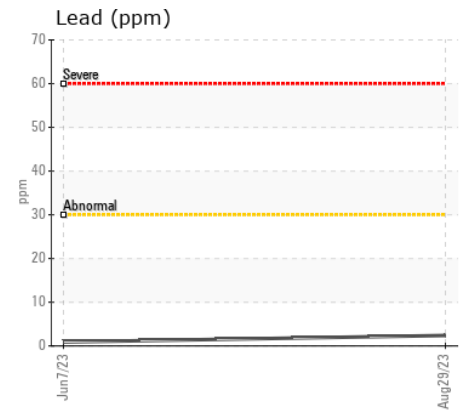
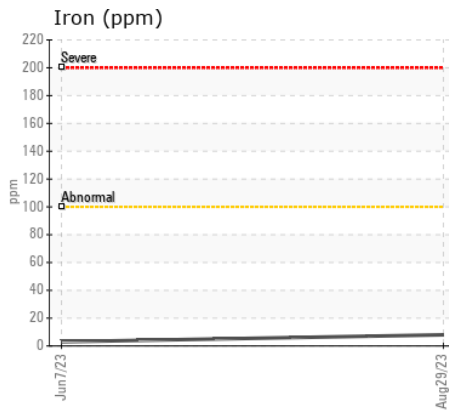
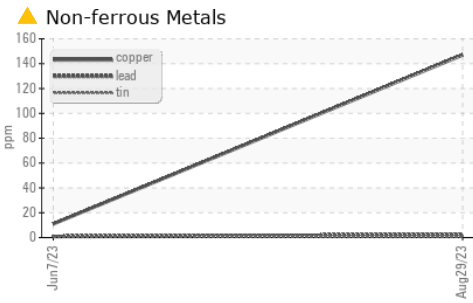
Sodium and/or potassium levels are high.

Silicon	ppm	ASTM D5185m	>60	5	5	---
Potassium	ppm	ASTM D5185m	>20	▲ 95	2	---
Fuel		WC Method	>5	<1.0	<1.0	---
Water		WC Method	>0.2	NEG	NEG	---
Glycol	%	*ASTM D2982		NEG	NEG	---
Soot %	%	*ASTM D7844	>3	0.1	0.1	---
Nitration	Abs/cm	*ASTM D7624	>20	9.0	8.4	---
Sulfation	Abs/.1mm	*ASTM D7415	>30	19.3	18.6	---
Silt	scalar	*Visual	NONE	NONE	NONE	---
Debris	scalar	*Visual	NONE	NONE	NONE	---
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	---
Appearance	scalar	*Visual	NORML	NORML	NORML	---
Odor	scalar	*Visual	NORML	NORML	NORML	---
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	---

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil.

Sodium	ppm	ASTM D5185m		▲ 70	2	---
Boron	ppm	ASTM D5185m		11	10	---
Barium	ppm	ASTM D5185m		3	1	---
Molybdenum	ppm	ASTM D5185m		111	101	---
Manganese	ppm	ASTM D5185m		<1	<1	---
Magnesium	ppm	ASTM D5185m		115	94	---
Calcium	ppm	ASTM D5185m	1300	4365	3841	---
Phosphorus	ppm	ASTM D5185m		1018	834	---
Zinc	ppm	ASTM D5185m	1300	1179	999	---
Sulfur	ppm	ASTM D5185m		5576	4589	---
Oxidation	Abs/.1mm	*ASTM D7414	>25	13.0	12.9	---
Base Number (BN)	mg KOH/g	ASTM D2896	14	14.58	15.96	---
Visc @ 100°C	cSt	ASTM D445	15.5	13.7	14.0	---



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : TR06158506 **Received** : 23 Apr 2024
Lab Number : 06158506 **Tested** : 29 Apr 2024
Unique Number : 10993929 **Diagnosed** : 29 Apr 2024 - Jonathan Hester
Test Package : MOB 2 (Additional Tests: Glycol)

DIGGING & RIGGING II
 10 CHRISTINA COURT
 SPARROWS POINT, MD
 US 21219
 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)

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F: