



LIEBHERR

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
141404 - TROPICAL SHIPPING
Component
Hydraulic System
Fluid
LIEBHERR HYDRAULIC 37 (--- GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		LM0001053	LM0001427	---
Sample Date		Client Info		02 Jul 2024	16 Mar 2024	---
Machine Age	hrs	Client Info		20956	20172	---
Oil Age	hrs	Client Info		0	0	---
Filter Age	hrs	Client Info		0	0	---
Oil Changed		Client Info		Not Changed	Not Changed	---
Filter Changed		Client Info		Changed	Changed	---
Sample Status				NORMAL	ABNORMAL	---

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>20	6	7	---
Chromium	ppm	ASTM D5185m	>10	0	0	---
Nickel	ppm	ASTM D5185m	>10	0	0	---
Titanium	ppm	ASTM D5185m		0	0	---
Silver	ppm	ASTM D5185m		0	0	---
Aluminum	ppm	ASTM D5185m	>10	0	0	---
Lead	ppm	ASTM D5185m	>10	0	0	---
Copper	ppm	ASTM D5185m	>75	9	9	---
Tin	ppm	ASTM D5185m	>10	0	<1	---
Vanadium	ppm	ASTM D5185m		0	<1	---
White Metal	scalar	*Visual	NONE	NONE	NONE	---
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	---

CONTAMINATION

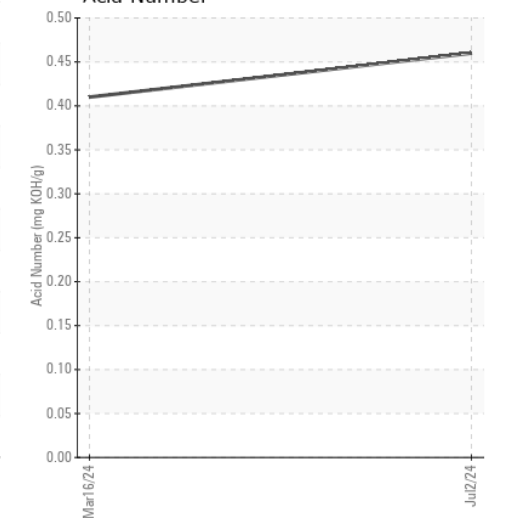
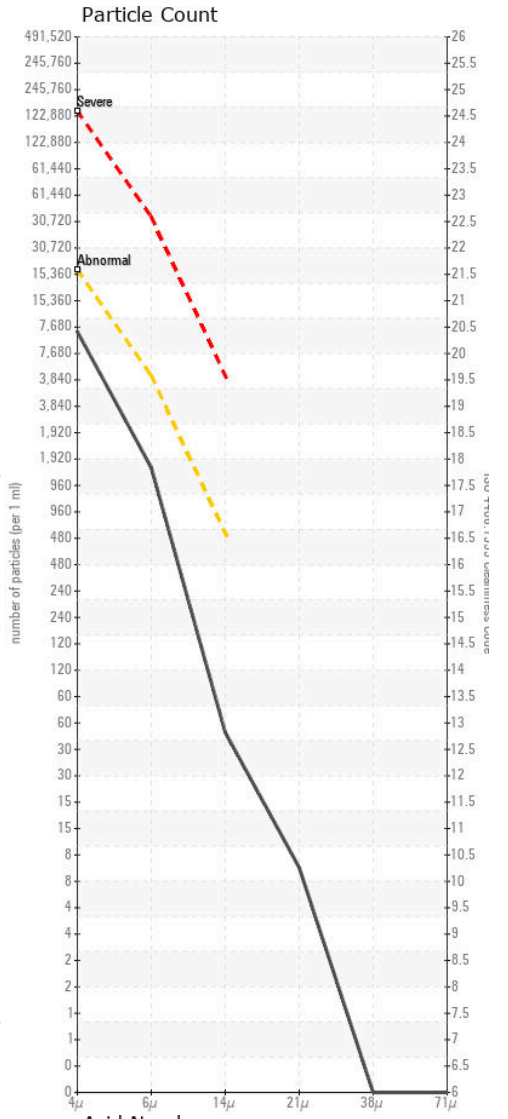
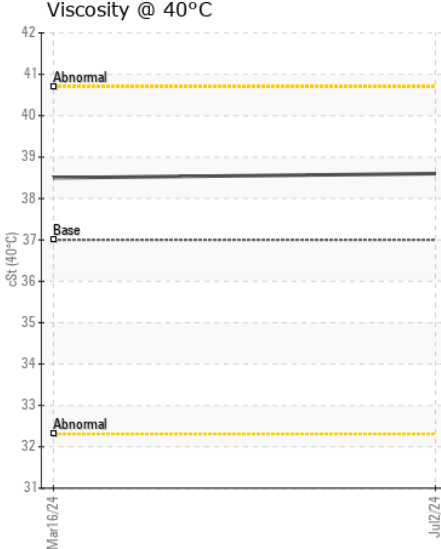
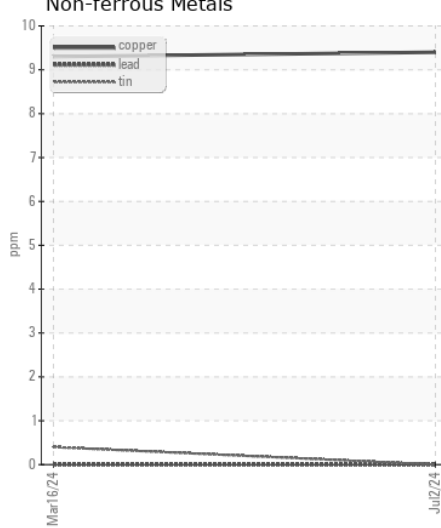
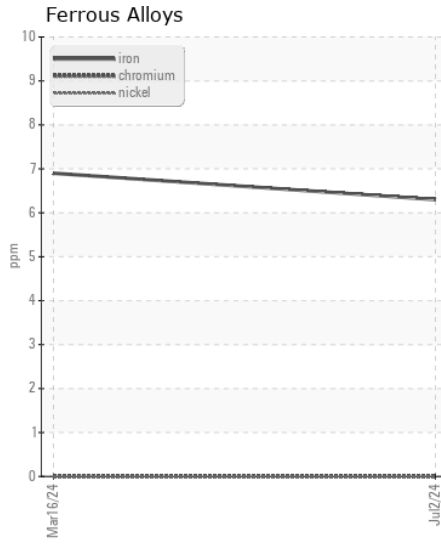
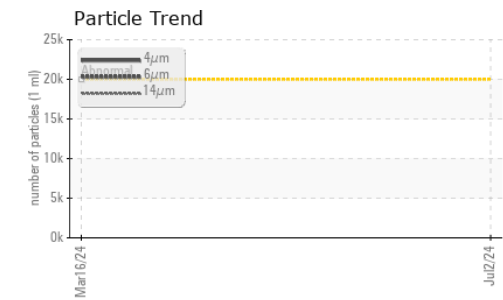
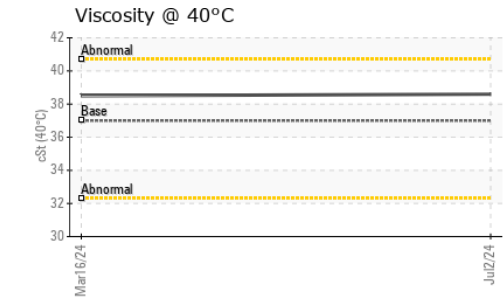
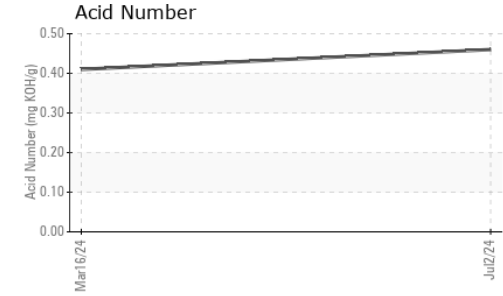
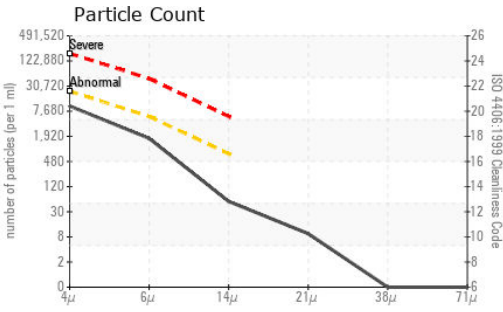
The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable.

Silicon	ppm	ASTM D5185m	>20	<1	<1	---
Potassium	ppm	ASTM D5185m	>20	1	0	---
Water		WC Method	>0.1	NEG	NEG	---
Particles >4µm		ASTM D7647	>20000	8908	---	---
Particles >6µm		ASTM D7647	>5000	1500	---	---
Particles >14µm		ASTM D7647	>640	47	---	---
Particles >21µm		ASTM D7647	>160	8	---	---
Particles >38µm		ASTM D7647	>40	0	---	---
Particles >71µm		ASTM D7647	>10	0	---	---
Oil Cleanliness		ISO 4406 (c)	>21/19/16	20/18/13	---	---
Silt	scalar	*Visual	NONE	NONE	NONE	---
Debris	scalar	*Visual	NONE	NONE	▲ MODER	---
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	---
Appearance	scalar	*Visual	NORML	NORML	NORML	---
Odor	scalar	*Visual	NORML	NORML	NORML	---
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	---

FLUID CONDITION

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		2	2	---
Boron	ppm	ASTM D5185m		<1	0	---
Barium	ppm	ASTM D5185m		0	0	---
Molybdenum	ppm	ASTM D5185m		1	1	---
Manganese	ppm	ASTM D5185m		<1	<1	---
Magnesium	ppm	ASTM D5185m		22	19	---
Calcium	ppm	ASTM D5185m		93	91	---
Phosphorus	ppm	ASTM D5185m		347	329	---
Zinc	ppm	ASTM D5185m		415	398	---
Sulfur	ppm	ASTM D5185m		2417	2376	---
Acid Number (AN)	mg KOH/g	ASTM D8045		0.46	0.41	---
Visc @ 40°C	cSt	ASTM D445	37	38.6	38.5	---



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : LM0001053
Lab Number : 06227351
Unique Number : 11110844
Test Package : CONST
Received : 03 Jul 2024
Tested : 05 Jul 2024
Diagnosed : 05 Jul 2024 - Wes Davis

LIEBHERR USA CO - Maritime Cranes
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 US 33018
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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)