



OIL ANALYSIS REPORT

WEAR	MARGINAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Area
GM Seattle Off Road Shop
 Machine Id
[GM Seattle Off Road Shop] 28-433
 Component
Hydraulic System
 Fluid
LIEBHERR HYDRAULIC HVI (--- GAL)

RECOMMENDATION

We recommend an early resample to monitor this condition. (Customer Sample Comment: Top Up Amount: 4 gallons)

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		PE0003084	PE0001018	PE12291091
Sample Date		Client Info		04 Jun 2024	13 Feb 2024	02 Nov 2021
Machine Age	hrs	Client Info		5353	4699	1165
Oil Age	hrs	Client Info		5353	4699	1165
Filter Age	hrs	Client Info		0	0	---
Oil Changed		Client Info		Oil Added	Oil Added	Not Changed
Filter Changed		Client Info		Changed	Changed	---
Sample Status				MARGINAL	ABNORMAL	MARGINAL

WEAR

Iron ppm levels are marginal. All other component wear rates are normal.

PQ	UOM	Method	Limit/Abn	Current	History1	History2
PQ		ASTM D8184		16	17	---
Iron	ppm	ASTM D5185m	>20	▲ 23	10	17
Chromium	ppm	ASTM D5185m	>10	1	0	0
Nickel	ppm	ASTM D5185m	>10	0	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m		0	0	<1
Aluminum	ppm	ASTM D5185m	>10	2	<1	1
Lead	ppm	ASTM D5185m	>10	10	0	10
Copper	ppm	ASTM D5185m	>75	5	<1	5
Tin	ppm	ASTM D5185m	>10	0	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	---
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	---

CONTAMINATION

The water content is negligible. There is no indication of any contamination in the oil.

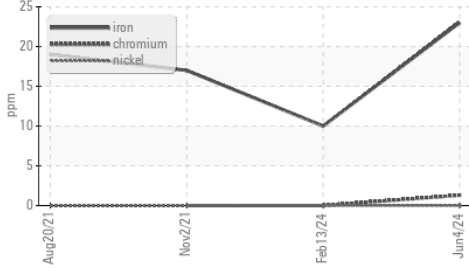
Silicon	ppm	ASTM D5185m	>20	8	6	3
Potassium	ppm	ASTM D5185m	>20	1	0	1
Water		WC Method	>0.1	NEG	NEG	NEG
Particles >4µm		ASTM D7647	>5000	3533	▲ 17286	---
Particles >6µm		ASTM D7647	>1300	131	▲ 4265	---
Particles >14µm		ASTM D7647	>160	6	▲ 185	---
Particles >21µm		ASTM D7647	>40	2	32	---
Particles >38µm		ASTM D7647	>10	0	0	---
Particles >71µm		ASTM D7647	>3	0	0	---
Oil Cleanliness		ISO 4406 (c)	>19/17/14	19/14/10	▲ 21/19/15	20/16/12
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	>0.1	NEG	NEG	---

FLUID CONDITION

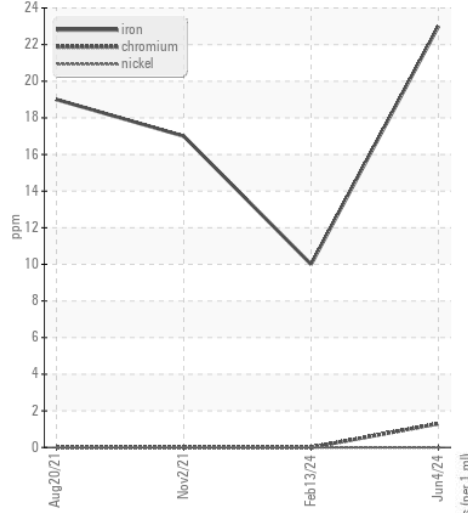
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		0	<1	1
Boron	ppm	ASTM D5185m		0	69	0
Barium	ppm	ASTM D5185m		1	0	0
Molybdenum	ppm	ASTM D5185m		0	0	0
Manganese	ppm	ASTM D5185m		<1	0	---
Magnesium	ppm	ASTM D5185m	7	8	10	7
Calcium	ppm	ASTM D5185m	1500	873	3119	1293
Phosphorus	ppm	ASTM D5185m	750	493	1099	569
Zinc	ppm	ASTM D5185m	820	593	1277	727
Sulfur	ppm	ASTM D5185m	4000	2331	4460	---
Acid Number (AN)	mg KOH/g	ASTM D8045	1.2	0.60	0.87	1.51
Visc @ 40°C	cSt	ASTM D445	52	43.1	49.0	---

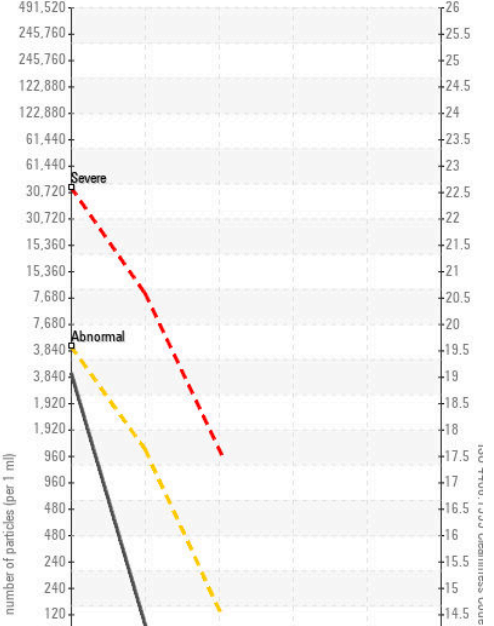
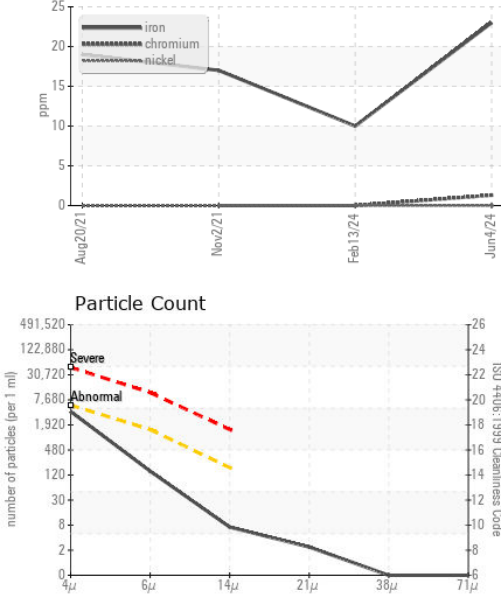
▲ Ferrous Alloys



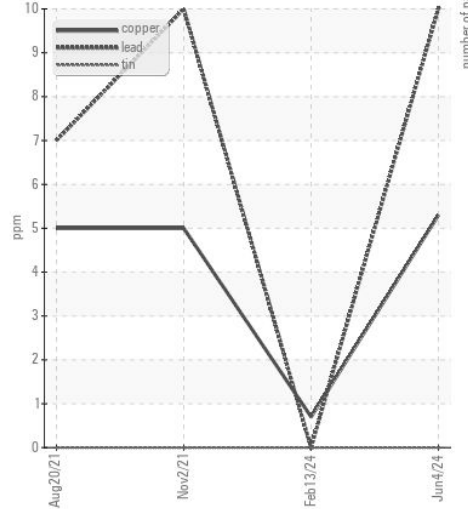
▲ Ferrous Alloys



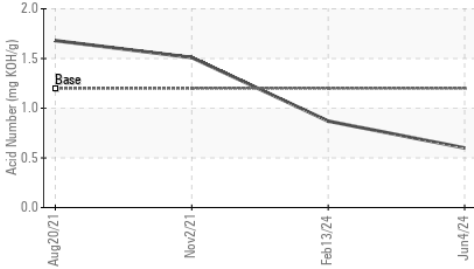
Particle Count



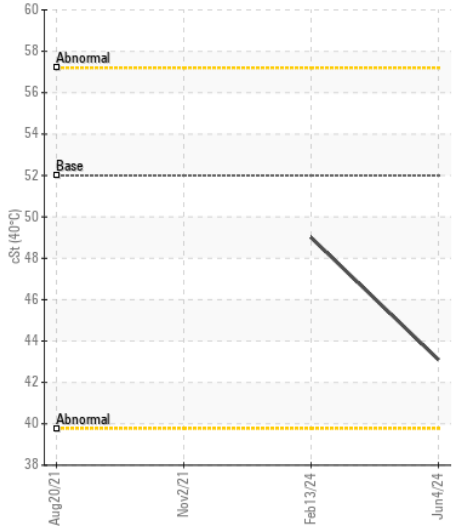
Non-ferrous Metals



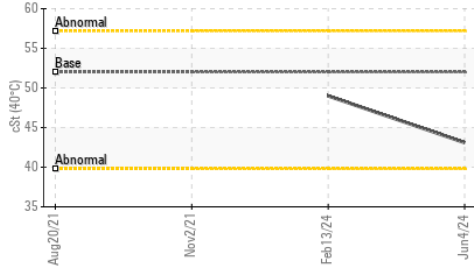
Acid Number



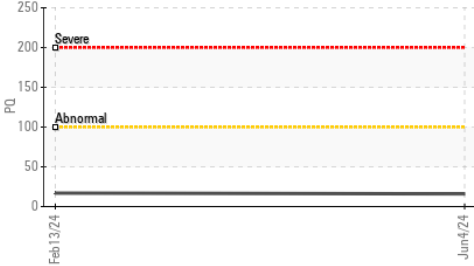
Viscosity @ 40°C



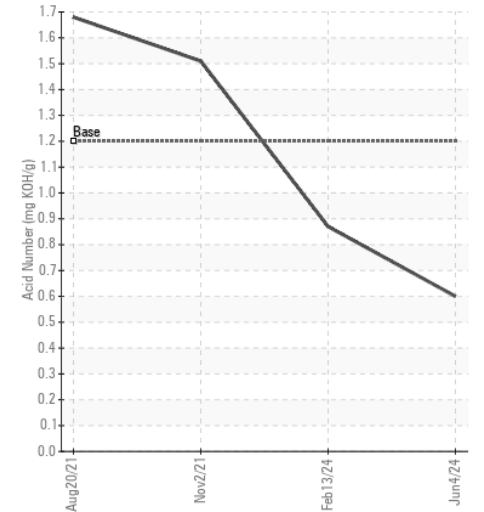
Viscosity @ 40°C



PQ



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PE0003084
Lab Number : 06210682
Unique Number : 11083546
Test Package : CONST (Additional Tests: ICP, KV40, PQ, PrtCount, SCREEN)

Gary Merlino Construction - Off Road Shop
 9125 10TH AVE SOUTH
 SEATTLE, WA
 US 98108
 Contact: Jesse Patterson
 oilsamples@gmccinc.com

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)

T: 1(866)292-1303

F: