

WEAR ABNORMAL CONTAMINATION ABNORMAL FLUID CONDITION ABNORMAL

Current

LH0288228

29 Apr 2024

23144

0

0

History1

21976

0

0

LH0278580 LH

05 Jan 2024 23 Aug 2023

0

0

0

History2



LIEBHERR LH60C 106512-1528

Left Final Drive

LIEBHERR GEAR BASIC 90 LS (--- GAL)

Test

Sample Number

Sample Date

Machine Age

Oil Age

Filter Age

UOM

hrs

hrs

hrs

Method

Client Info

Client Info

Client Info

Client Info

Client Info

Limit/Abn

RECOMMENDATION

We advise that you check all areas where dirt can enter the system. The oil change at the time of sampling has been noted. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition.

WEAR

Iron and chromium ppm levels are abnormal. Aluminum ppm levels are noted. Gear wear is indicated.

CONTAMINATION

Elemental levels of silicon (Si) and aluminum (Al) indicate aluminasilicate (coarse dirt) ingress. High amount of ingressed dirt has caused abrasive wear to the component.

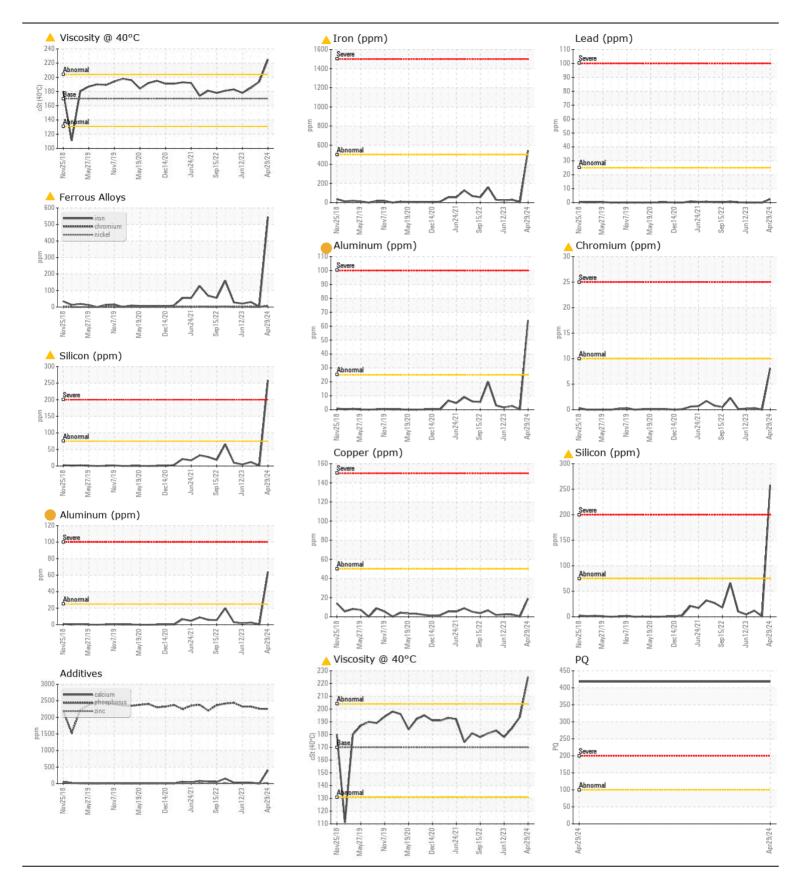
Oil Changed Client Info None None None Filter Changed Client Info None None None Sample Status ASTM D8184/ ABNORMAL NORMAL NORMAL PQ ASTM D8185// 500 A 544 2 30 Chromium ppm ASTM D5185// >10 3 <1 <1 Nickel ppm ASTM D5185// >10 3 <1 <1 Silver ppm ASTM D5185/// 0 <1 3 <1 Aluminum ppm ASTM D5185/// 0 0 0 0 Aluminum ppm ASTM D5185/// 5 0 3 <1 3 Lead ppm ASTM D5185/// >1 0 0 0 Vanadium ppm ASTM D5185/// <1 0 0 0 Vanadium ppm ASTM D5185/// <1 1 1 1 1 Van	T IIICE Age	1113			v	0	0
Sample StatusABNORMALNORMALNORMALNORMALPQASTM D8184*418IronppmASTM D5185(m) >10544230ChromiumppmASTM D5185(m) >1050<1NickelppmASTM D5185(m) >1050<1SilverppmASTM D5185(m) >25000AluminumppmASTM D5185(m) >25000AluminumppmASTM D5185(m) >25200CopperppmASTM D5185(m) >2519<12TinppmASTM D5185(m) >10<100VanadiumppmASTM D5185(m) >10<100VanadiumppmASTM D5185(m) >10<100VanadiumppmASTM D5185(m) >10<100VanadiumppmASTM D5185(m) >5019<112Yellow MetalscalarVisual*NONENONENONEYellow MetalscalarVisual*NONENONENONESiliconppmASTM D5185(m) >2012<1<1DebrisscalarVisual*NONENONENONESand/DirtscalarVisual*NORENORMNORMAppearancescalarVisual*NORENORMNORMAppearancescalarVisual*NORNORMNORMAppearancescalarVisual*0	Oil Changed		Client Info		Changed	Changed	Changed
PQ ASTM D8184* 418 Iron ppm ASTM D5185(m) >500 ▲ 544 2 30 Chromium ppm ASTM D5185(m) >10 ▲ 8 0 <1 Nickel ppm ASTM D5185(m) >10 3 <1 <1 Titanium ppm ASTM D5185(m) >10 3 <1 <1 Silver ppm ASTM D5185(m) >25 0 0 0 Aluminum ppm ASTM D5185(m) >25 2 0 0 Copper ppm ASTM D5185(m) >25 19 <1 2 Tin ppm ASTM D5185(m) >50 19 <1 0 0 Vanadium ppm ASTM D5185(m) >50 19 <1 0 0 Vanadium ppm ASTM D5185(m) >50 12 <1 2 Silicon ppm ASTM D5185(m) >20 NONE <	Filter Changed		Client Info		None	None	None
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Iron ppm ASTM D5185(m) >500 ▲ 544 2 30 Chromium ppm ASTM D5185(m) >10 ▲ 8 0 <1 Nickel ppm ASTM D5185(m) >10 3 <1 <1 Titanium ppm ASTM D5185(m) >10 3 <1 <1 Silver ppm ASTM D5185(m) >25 ● 64 <1 3 Lead ppm ASTM D5185(m) >25 2 0 0 Copper ppm ASTM D5185(m) >50 19 <1 2 Tin ppm ASTM D5185(m) >10 <1 0 0 Vanadium ppm ASTM D5185(m) >10 <1 0 0 Vanadium ppm ASTM D5185(m) >20 12 <1 12 Tin ppm ASTM D5185(m) >20 12 <1 <1 Yellow Metal scalar Visual* NONE	PO				440		
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Nickel ppm ASTM D5185(m) >10 3 <1			· · /				
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Silver ppm ASTM D5185(m) 0 0 0 0 Aluminum ppm ASTM D5185(m) >25 2 0 0 Copper ppm ASTM D5185(m) >50 19 <1 2 Tin ppm ASTM D5185(m) >10 <1 0 0 Vanadium ppm ASTM D5185(m) <1 0 0 0 Vanadium ppm ASTM D5185(m) <1 0 0 0 Vanadium ppm ASTM D5185(m) >10 <1 0 0 Valite Metal scalar Visual* NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE Silicon ppm ASTM D5185(m) >20 12 <1 <1 Water WC Method >0.2 NEG NORE NONE NONE Debris scalar Visual* NORE </th <th></th> <th></th> <th>· · /</th> <th>>10</th> <th></th> <th></th> <th></th>			· · /	>10			
Aluminum ppm ASTM D5185(m) >25 64 <1					-		
Lead ppm ASTM D5185(m) >25 2 0 0 Copper ppm ASTM D5185(m) >50 19 <1 2 Tin ppm ASTM D5185(m) >10 <1 0 0 Vanadium ppm ASTM D5185(m) >10 <1 0 0 White Metal scalar Visual* NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE Silicon ppm ASTM D5185(m) >75 ▲ 258 <1 12 Potassium ppm ASTM D5185(m) >20 12 <1 <1 Water WC Method >0.2 NEG NONE NONE NONE Debris scalar Visual* NONE NONE NONE NONE Appearance scalar Visual* NORML NORML NORML NORML Emulsified Water scalar			· · /	0.5			
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Tin ppm ASTM D5185(m) >10 <1		ppm	· · ·				
Vanadium ppm ASTM D5185(m) <1		ppm	ASTM D5185(m)	>50	19		
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Silicon ppm ASTM D5185(m) >75 \checkmark 258 <1	White Metal	scalar	Visual*	NONE	NONE	NONE	NONE
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PotassiumppmASTM D5185(m)>2012<1	Silicon	ppm	ASTM D5185(m)	>75	4 258	<1	12
WaterWC Method>0.2NEGNEGNEGSiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMNORMLNORMLHAZYOdorscalarVisual*NORMNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*>0.2NEGNEGNEGSodiumppmASTM D5185(m)03<12BariumppmASTM D5185(m)0200MagnesiumppmASTM D5185(m)02801MagnesiumppmASTM D5185(m)<1136<16CalciumppmASTM D5185(m)2143225122602327ZincppmASTM D5185(m)<11829SulfurppmASTM D5185(m)<11829SulfurppmASTM D5185(m)23468242012404525833Visc @ 40°CcStASTM D7279(m)17025194185	Potassium		ASTM D5185(m)	>20	12	<1	<1
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Emulsified Water scalar Visual* >0.2 NEG NEG NEG Sodium ppm ASTM D5185(m) 11 1 3 Boron ppm ASTM D5185(m) 0 3 <1 2 Barium ppm ASTM D5185(m) 0 2 0 0 Molybdenum ppm ASTM D5185(m) 0 0 0 0 Manganese ppm ASTM D5185(m) 0 28 0 1 Magnesium ppm ASTM D5185(m) 0 28 0 1 Calcium ppm ASTM D5185(m) <1 136 <1 6 Calcium ppm ASTM D5185(m) <1 405 2 35 Phosphorus ppm ASTM D5185(m) 2143 2251 2260 2327 Zinc ppm ASTM D5185(m) <1 18 2 9 Sulfur ppm ASTM D5185(m) 23468 24201<	Appearance	scalar	Visual*	NORML	NORML	NORML	HAZY
Sodium ppm ASTM D5185(m) 11 1 3 Boron ppm ASTM D5185(m) 0 3 <1	Odor	scalar	Visual*	NORML	NORML	NORML	NORML
Boron ppm ASTM D5185(m) 0 3 <1	Emulsified Water	scalar	Visual*	>0.2	NEG	NEG	NEG
Barium ppm ASTM D5185(m) 0 2 0 0 Molybdenum ppm ASTM D5185(m) 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 28 0 1 Magnesium ppm ASTM D5185(m) <1 136 <1 6 Calcium ppm ASTM D5185(m) <1 405 2 35 Phosphorus ppm ASTM D5185(m) 2143 2251 2260 2327 Zinc ppm ASTM D5185(m) <1 18 2 9 Sulfur ppm ASTM D5185(m) 23468 24201 24045 25833 Visc @ 40°C cSt ASTM D7279(m) 170 225 194 185	Sodium	ppm	ASTM D5185(m)		11	1	3
Barium ppm ASTM D5185(m) 0 2 0 0 Molybdenum ppm ASTM D5185(m) 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 28 0 1 Magnesium ppm ASTM D5185(m) <1	Boron	ppm	ASTM D5185(m)	0	3	<1	2
Manganese ppm ASTM D5185(m) 0 28 0 1 Magnesium ppm ASTM D5185(m) <1	Barium		ASTM D5185(m)	0	2	0	0
Manganese ppm ASTM D5185(m) 0 28 0 1 Magnesium ppm ASTM D5185(m) <1	Molybdenum	ppm	ASTM D5185(m)	0	0	0	0
Magnesium ppm ASTM D5185(m) <1	Manganese		ASTM D5185(m)	0	28	0	1
Phosphorus ppm ASTM D5185(m) 2143 2251 2260 2327 Zinc ppm ASTM D5185(m) <1		ppm	ASTM D5185(m)	<1	136	<1	6
Phosphorus ppm ASTM D5185(m) 2143 2251 2260 2327 Zinc ppm ASTM D5185(m) <1	0		· · ·		405		35
Zinc ppm ASTM D5185(m) <1	Phosphorus		ASTM D5185(m)	2143	2251	2260	2327
Sulfur ppm ASTM D5185(m) 23468 24201 24045 25833 Visc @ 40°C cSt ASTM D7279(m) 170 ▲ 225 194 185	•		· · /	<1	18	2	9
Visc @ 40°C cSt ASTM D7279(m) 170 (225) 194 185	Sulfur			23468	24201	24045	25833
	Visc @ 40°C		· · /	170		194	185
			- ()			-	

FLUID CONDITION

Viscosity of sample indicates oil is within SAE 80W140 range, advise investigate. This plus the additive levels indicates that this is not the same brand, or type of oil as reported. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Report Id: MANSEL [WCAMIS] 02633286 (Generated: 05/05/2024 12:02:05) Rev: 1

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Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 Gerdau - Mandak Metal Processors Ltd., CALA Sample No. 1 Railway St., P.O. Box 334 : LH0288228 Received :03 May 2024 Selkirk, MB Lab Number : 02633286 Tested :03 May 2024 ISO 17025:2017 Accredited : 05 May 2024 - Kevin Marson CA R1A 2B3 Unique Number : 5774439 Diagnosed Laboratory Test Package : MOB 1 (Additional Tests: PQ) Contact: Santiago Giraldo To discuss this sample report, contact Customer Service at 1-800-268-2131. santiago.giraldo@gerdau.com Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab. T: F: (204)482-8241 Validity of results and interpretation are based on the sample and information as supplied.

Submitted By: Bastian Firmbach Page 2 of 2