

OIL ANALYSIS REPORT

Sample Rating Trend

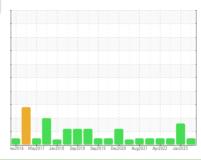


METSO LINDEMAN METSO BALER M HYD

Component

Hydraulic System

AW HYDRAULIC OIL ISO 46 (800 GAL)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable.

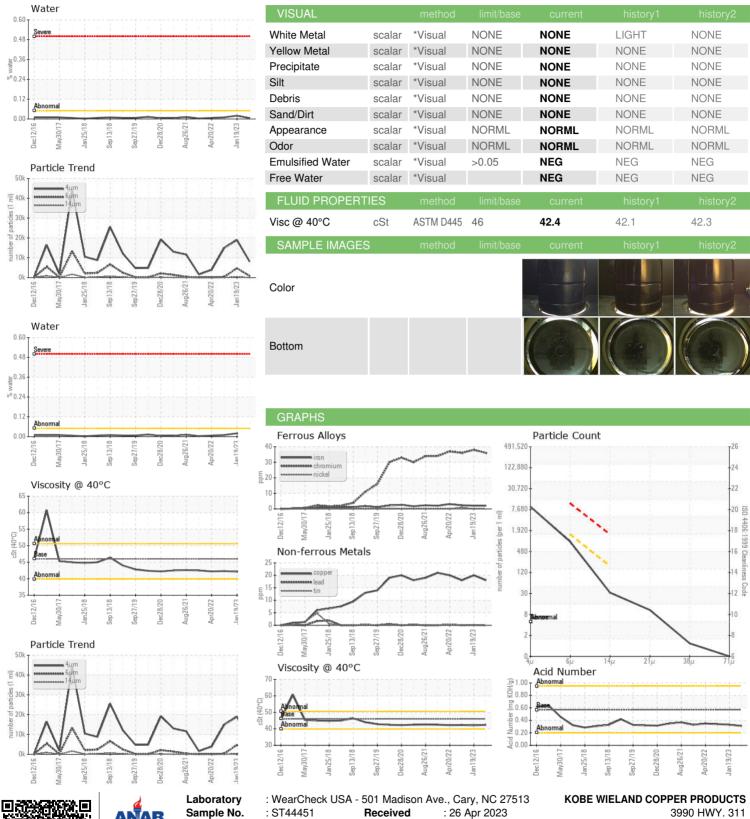
Fluid Condition

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

Sample Number Client Info ST44451 ST44832 ST44242 Sample Date Client Info 21 Apr 2023 19 Jan 2023 22 Aug 2 Machine Age hrs Client Info 0 0 0 Oil Age hrs Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A Sample Status method Imitibase method Imitibase Iron ppm ASTM D5185m 20 2 2 2 2 Chromium ppm ASTM D5185m 20 36 38 36 Nickel ppm ASTM D5185m 20 0 0 0 Chromium ppm ASTM D5185m 20 0 0 0 Itanium ppm ASTM D5185m 20 0 0 0 Allead ppm ASTM D5185m 20 18 20 18 Tin ppm ASTM D5185m			lec2016 May20	017 Jan2018 Sep2018 Sep	2019 Dec2020 Aug2021 Apr2022	Jan 2023	
Sample Date Cilent Info 21 Apr 2023 19 Jan 2023 22 Aug 2	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 0 0 0 Oil Changed hrs Client Info N/A N/A N/A N/A Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL NORMAL WEAR METALS method limit/base current history history Iron ppm ASTM D5185m >20 2 2 2 2 Iron ppm ASTM D5185m >20 36 38 36 Nickel ppm ASTM D5185m >20 0 0 0 Nickel ppm ASTM D5185m >20 0 0 0 Aluminum ppm ASTM D5185m >20 18 20 18 Lead ppm ASTM D5185m >20 18 20 18 Tin ppm ASTM D5185m >20 0 0 0 Cadmium ppm ASTM D5185m 5 9 </td <td>Sample Number</td> <td></td> <td>Client Info</td> <td></td> <th>ST44451</th> <td>ST44832</td> <td>ST44242</td>	Sample Number		Client Info		ST44451	ST44832	ST44242
Oil Age hrs Client Info N/A N/A N/A N/A Sample Status Client Info N/A N/A N/A N/A N/A WEAR METALS method limit/base current history1 history1 Iron ASTM D5185m >20 2 0 <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>21 Apr 2023</th> <td>19 Jan 2023</td> <td>22 Aug 2022</td>	Sample Date		Client Info		21 Apr 2023	19 Jan 2023	22 Aug 2022
Oil Changed Sample Status Client Info N/A NORMAL N/A NORMAL N/A NORMAL N/A NORMAL WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >20 2 2 2 Chromium ppm ASTM D5185m >20 36 38 36 Nickel ppm ASTM D5185m >20 0 0 <1	Machine Age	hrs	Client Info		0	0	0
Sample Status method limit/base current history1 history1 Iron ppm ASTM D5185m >20 2 2 2 2 Chromium ppm ASTM D5185m >20 36 38 36 Nickel ppm ASTM D5185m >20 0 0 <1	Oil Age	hrs	Client Info		0	0	0
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >20 2 2 2 2 Chromium ppm ASTM D5185m >20 36 38 36 Nickel ppm ASTM D5185m >20 0 0 0 Titanium ppm ASTM D5185m 0 0 0 0 Aluminum ppm ASTM D5185m 20 <1	Oil Changed		Client Info		N/A	N/A	N/A
Iron	Sample Status				NORMAL	ABNORMAL	NORMAL
Chromium ppm ASTM D5185m >20 36 38 36 Nickel ppm ASTM D5185m >20 0 0 <1 Titanium ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m >20 <1 0 0 Aluminum ppm ASTM D5185m >20 <1 0 0 Lead ppm ASTM D5185m >20 18 20 18 Tin ppm ASTM D5185m >20 0 0 0 Vanadium ppm ASTM D5185m >20 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 9 10	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>20	2	2	2
Titanium ppm ASTM D5185m 0 0 0 Silver ppm ASTM D5185m 0 0 0 Aluminum ppm ASTM D5185m >20 <1 0 0 Lead ppm ASTM D5185m >20 18 20 18 Tin ppm ASTM D5185m >20 0 0 0 Vanadium ppm ASTM D5185m 20 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 9 10 10 Magnesium ppm ASTM D5185m 5 3 3 3 3 <t< td=""><td>Chromium</td><td>ppm</td><td>ASTM D5185m</td><td>>20</td><th>36</th><td>38</td><td>36</td></t<>	Chromium	ppm	ASTM D5185m	>20	36	38	36
Silver ppm ASTM D5185m 0 0 0 Aluminum ppm ASTM D5185m >20 <1	Nickel	ppm	ASTM D5185m	>20	0	0	<1
Aluminum ppm ASTM D5185m >20 <1 0 0 Lead ppm ASTM D5185m >20 0 <1	Titanium	ppm	ASTM D5185m		0	0	0
Lead ppm ASTM D5185m >20 0 <1 0 Copper ppm ASTM D5185m >20 18 20 18 Tin ppm ASTM D5185m >20 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 9 10 10 Molybdenum ppm ASTM D5185m 5 9 10 10 Magnesium ppm ASTM D5185m 20 11 0 0 Magnesium ppm ASTM D5185m 200 92 95	Silver	ppm	ASTM D5185m		0	0	0
Copper ppm ASTM D5185m >20 18 20 18 Tin ppm ASTM D5185m >20 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 9 10 10 Molybdenum ppm ASTM D5185m 5 3 3 3 3 Manganese ppm ASTM D5185m 25 13 11 10 0 Magnesium ppm ASTM D5185m 25 13 11 10 0 Calcium ppm ASTM D5185m 20 92 95 91 Phosphorus ppm ASTM D5185m 300 330 <td>Aluminum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>20</td> <th><1</th> <td>0</td> <td>0</td>	Aluminum	ppm	ASTM D5185m	>20	<1	0	0
Tin ppm ASTM D5185m >20 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 0 1 0 Molybdenum ppm ASTM D5185m 5 3 3 3 3 Manganese ppm ASTM D5185m 5 3 3 3 3 Magnesium ppm ASTM D5185m 25 13 11 10 Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 200 92 95 91 Sulfur ppm ASTM D5185m 370	Lead	ppm	ASTM D5185m	>20	0	<1	0
Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 0 1 0 Molybdenum ppm ASTM D5185m 5 3 3 3 3 Manganese ppm ASTM D5185m 25 13 11 10 Magnesium ppm ASTM D5185m 25 13 11 10 Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 200 330 326 332 Zinc ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base	Copper	ppm	ASTM D5185m	>20	18	20	18
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 0 1 0 Molybdenum ppm ASTM D5185m 5 3 3 3 Manganese ppm ASTM D5185m 25 13 11 10 Magnesium ppm ASTM D5185m 250 95 91 Phosphorus ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 200 330 326 332 Zinc ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	Tin	ppm	ASTM D5185m	>20	0	0	0
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 0 1 0 Molybdenum ppm ASTM D5185m 5 3 3 3 Manganese ppm ASTM D5185m 25 13 11 10 Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 5 9 10 10 Barium ppm ASTM D5185m 5 0 1 0 Molybdenum ppm ASTM D5185m 5 3 3 3 Manganese ppm ASTM D5185m 21 0 0 Magnesium ppm ASTM D5185m 25 13 11 10 Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 5 0 1 0 Molybdenum ppm ASTM D5185m 5 3 3 3 Manganese ppm ASTM D5185m 21 0 0 Magnesium ppm ASTM D5185m 25 13 11 10 Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 5 3 3 3 Manganese ppm ASTM D5185m <1	Boron	ppm	ASTM D5185m	5	9	10	10
Manganese ppm ASTM D5185m <1 0 0 Magnesium ppm ASTM D5185m 25 13 11 10 Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 history1 history1 history1 Silicon ppm ASTM D5185m >20 0 <1	Barium	ppm	ASTM D5185m	5	0	1	0
Magnesium ppm ASTM D5185m 25 13 11 10 Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 history1 Silicon ppm ASTM D5185m >15 <1 1 1 Sodium ppm ASTM D5185m >15 <1 1 1 Sodium ppm ASTM D5185m >20 0 <1 <1 1 Water % ASTM D6185m >20 0 <1 <1 1 Water % ASTM D6304 >0.05 0.005 0.005 0.020 0.010 <th< td=""><td>Molybdenum</td><td>ppm</td><td>ASTM D5185m</td><td>5</td><th>3</th><td>3</td><td>3</td></th<>	Molybdenum	ppm	ASTM D5185m	5	3	3	3
Calcium ppm ASTM D5185m 200 92 95 91 Phosphorus ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	Manganese	ppm	ASTM D5185m		<1	0	0
Phosphorus ppm ASTM D5185m 300 330 326 332 Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	Magnesium	ppm	ASTM D5185m	25	13	11	10
Zinc ppm ASTM D5185m 370 400 405 427 Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	Calcium	ppm	ASTM D5185m	200	92	95	91
Sulfur ppm ASTM D5185m 2500 1643 1360 1230 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	Phosphorus	ppm	ASTM D5185m	300	330	326	332
CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 <1	Zinc	ppm	ASTM D5185m	370	400	405	427
Silicon ppm ASTM D5185m >15 <1 1 1 Sodium ppm ASTM D5185m 3 0 2 Potassium ppm ASTM D5185m >20 0 <1 <1 Water % ASTM D6304 >0.05 0.005 0.0020 0.010 ppm Water ppm ASTM D6304 >500 57.3 200.1 103.7 FLUID CLEANLINESS method limit/base current history1 history1 history1 Particles >4μm ASTM D7647 >1300 805 Δ 4698 321 Particles >6μm ASTM D7647 >160 28 Δ 305 36 Particles >21μm ASTM D7647 >40 9 Δ 51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 21/19/15 21/16/16	Sulfur	ppm	ASTM D5185m	2500	1643	1360	1230
Sodium ppm ASTM D5185m 3 0 2 Potassium ppm ASTM D5185m >20 0 <1 <1 Water % ASTM D6304 >0.05 0.005 0.020 0.010 ppm Water ppm ASTM D6304 >500 57.3 200.1 103.7 FLUID CLEANLINESS method limit/base current history1 history2 history2 history2 history2 history2 history2 history2 history2 history2 widehalines history2 history2 history2 histor	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 3 0 2 Potassium ppm ASTM D5185m >20 0 <1	Silicon	ppm	ASTM D5185m	>15	<1	1	1
Water % ASTM D6304 >0.05 0.005 0.020 0.010 ppm Water ppm ASTM D6304 >500 57.3 200.1 103.7 FLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 8064 18903 14998 Particles >6μm ASTM D7647 >1300 805 Δ4698 321 Particles >14μm ASTM D7647 >160 28 Δ305 36 Particles >21μm ASTM D7647 >40 9 Δ51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 Δ21/19/15 21/16/16	Sodium	ppm	ASTM D5185m		3	0	2
Water % ASTM D6304 >0.05 0.005 0.020 0.010 ppm Water ppm ASTM D6304 >500 57.3 200.1 103.7 FLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 >1300 805 Δ 4698 321 Particles >14μm ASTM D7647 >160 28 Δ 305 36 Particles >21μm ASTM D7647 >40 9 Δ 51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 Δ 21/19/15 21/16/16	Potassium	ppm	ASTM D5185m	>20	0	<1	<1
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Particles >4μm ASTM D7647 8064 18903 14998 Particles >6μm ASTM D7647 >1300 805 Δ 4698 321 Particles >14μm ASTM D7647 >160 28 Δ 305 36 Particles >21μm ASTM D7647 >40 9 Δ 51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 Δ 21/19/15 21/16/16/16/16/16/16/16/16/16/16/16/16/16							
Particles >6μm ASTM D7647 >1300 805 4698 321 Particles >14μm ASTM D7647 >160 28 305 36 Particles >21μm ASTM D7647 >40 9 51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 21/19/15 21/16/16/16/16/16/16/16/16/16/16/16/16/16	FLUID CLEANLIN	IESS _	method	limit/base	current	history1	history2
Particles >14μm ASTM D7647 >160 28 3 305 36 Particles >21μm ASTM D7647 >40 9 5 51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 21/19/15 21/16/19/15	Particles >4µm		ASTM D7647		8064	18903	14998
Particles >21μm ASTM D7647 >40 9 51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 21/19/15 21/16/16	Particles >6µm		ASTM D7647	>1300	805	▲ 4698	321
Particles >21μm ASTM D7647 >40 9 4 51 12 Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 4 21/19/15 21/16/16/16/16/16/16/16/16/16/16/16/16/16	·		ASTM D7647	>160	28	▲ 305	36
Particles >38μm ASTM D7647 >10 1 2 1 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 \triangle 21/19/15 21/16/16/16/16/16/16/16/16/16/16/16/16/16	•		ASTM D7647	>40	9		12
Particles >71μm ASTM D7647 >3 0 0 0 0 OII Cleanliness ISO 4406 (c) >/17/14 20/17/12 \triangle 21/19/15 21/16/	•		ASTM D7647	>10		2	1
Oil Cleanliness ISO 4406 (c) >/17/14 20/17/12 • 21/19/15 21/16/	·			>3	0	0	0
							21/16/12
FLUID DEGRADATION method limit/base current history1 history	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Acid Number (AN) mg KOH/g ASTM D8045 0.57 0.31 0.33 0.34	Acid Number (AN)	mg KOH/g	ASTM D8045	0.57	0.31	0.33	0.34



OIL ANALYSIS REPORT







Certificate L2367

Sample No. Lab Number

Unique Number

: 05830716 : 10444209

: ST44451

Diagnosed Diagnostician Test Package : IND 2 (Additional Tests: KF)

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) 3990 HWY. 311 PINE HALL, NC US 27042

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: 28 Apr 2023

: Don Baldridge