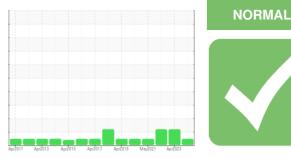


OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

ALSTOM 3512

Component Hydraulic System Fluid ESSO UNIVIS N 32 (55 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

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

Fluid Condition

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

SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0909891	WC0667667	WC0643757
Sample Date		Client Info		02 Apr 2024	05 Apr 2023	03 Apr 2022
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				NORMAL	ABNORMAL	ATTENTION
CONTAMINATION	I	method	limit/base	current	history1	history2
Water		WC Method	>0.1	NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>20	0	0	1
Chromium	ppm	ASTM D5185m	>10	0	<1	2
Nickel	ppm	ASTM D5185m	>10	4	14	25
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>10	<1	<1	<1
Lead	ppm	ASTM D5185m	>10	6	9	10
Copper	ppm	ASTM D5185m	>75	<1	3	3
Tin	ppm	ASTM D5185m	>10	<1	0	<1
Antimony	ppm	ASTM D5185m				
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm		limit/base	current 0	history1 0	history2 <1
	ppm ppm					
Boron		ASTM D5185m		0	0	<1
Boron Barium	ppm	ASTM D5185m ASTM D5185m	.1	0 0	0	<1 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	.1	0 0 0	0 0 0	<1 0 0
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3	0 0 0 <1	0 0 0 <1	<1 0 0 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0	0 0 <1 1	0 0 <1 0	<1 0 0 0 0
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0 74 266	0 0 <1 1 49	0 0 <1 0 50	<1 0 0 0 0 46
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0 74 266	0 0 <1 1 49 349	0 0 <1 0 50 354	<1 0 0 0 0 46 343
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0 74 266	0 0 <1 1 49 349 460	0 0 <1 0 50 354 447	<1 0 0 0 0 46 343 370
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0 74 266 338	0 0 <1 1 49 349 460 2407	0 0 2 3 0 50 354 447 2583	<1 0 0 0 46 343 370 2360
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0 74 266 338	0 0 2 3 1 49 349 460 2407 current	0 0 2 3 1 0 50 354 447 2583 history1	<1 0 0 0 46 343 370 2360 history2
Boron Barium Molybdenum Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0 74 266 338 338 Iimit/base >20	0 0 2 3 1 49 349 460 2407 current 1	0 0 2 3 50 3 54 447 2 5 8 3 history1 <1	<1 0 0 0 46 343 370 2360 history2 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	.1 .3 0 74 266 338 338 Iimit/base >20	0 0 2 3 1 49 349 460 2407 current 1 1	0 0 0 <1 0 50 354 447 2583 history1 <1 <1	<1 0 0 0 46 343 370 2360 history2 <1 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	.1 .3 0 74 266 338 imit/base >20	0 0 2 3 1 49 349 460 2407 <i>current</i> 1 1 1	0 0 0 <1 0 50 354 447 2583 history1 <1 <1 <1 0	<1 0 0 0 46 343 370 2360 history2 <1 2 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	.1 .3 .74 266 338 338 limit/base >20 limit/base	0 0 0 <1 1 49 349 460 2407 <i>current</i> 1 1 1 1 1 <i>current</i>	0 0 0 <1 0 50 354 447 2583 history1 <1 <1 0 history1	<1 0 0 0 46 343 370 2360 history2 <1 2 0 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLINE Particles >4µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	.1 .3 .74 266 338 266 338 20 20 >20 20 20 1imit/base >20	0 0 0 <1 1 49 349 460 2407 <i>current</i> 1 1 1 1 1 2 5805	0 0 0 <1 0 50 354 447 2583 history1 <1 <1 0 history1 0 history1	<1 0 0 0 46 343 370 2360 history2 <1 2 0 history2 5686
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLINE Particles >4µm Particles >6µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	.1 .3 .74 .266 .338 	0 0 0 <1 1 49 349 460 2407 <i>current</i> 1 1 1 1 1 5805 1126	0 0 0 <1 0 50 354 447 2583 history1 <1 <1 0 history1 0 history1 0 history1	<1 0 0 0 46 343 370 2360 history2 <1 2 0 history2 5686 1651
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLINE Particles >4µm Particles >14µm Particles >21µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7647 ASTM D7647	.1 .3 .74 .266 .338 	0 0 0 <1 1 49 349 460 2407 <i>current</i> 1 1 1 1 1 5805 1126 91	0 0 0 <1 0 50 354 447 2583 history1 <1 <1 <1 0 0 history1 0 14853 ▲ 3158 140	<1 0 0 0 0 46 343 370 2360 history2 <1 2 0 history2 5686 1651 203
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLINE Particles >4µm Particles >14µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7647 ASTM D7647 ASTM D7647	.1 .3 .7 266 338 266 338 26 338 20 imit/base >20 imit/base >10000 >1300 >160 >40	0 0 0 <1 1 49 349 460 2407 <i>current</i> 1 1 1 1 1 5805 1126 91 38	0 0 0 3 50 354 447 2583 history1 <1 <1 <1 <1 0 0 history1 14853 ▲ 3158 140 44	<1 0 0 0 4 343 370 2360 history2 <1 2 0 history2 5 686 1651 203 7 3 7 3 7 3 7 3 1 5 1 3 1 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3

ISO 4406 (c) >20/17/14

Oil Cleanliness

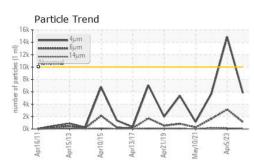
🔺 21/19/14

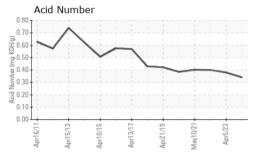
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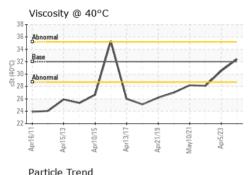
20/17/14



OIL ANALYSIS REPORT





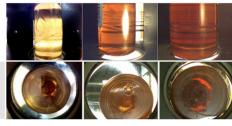


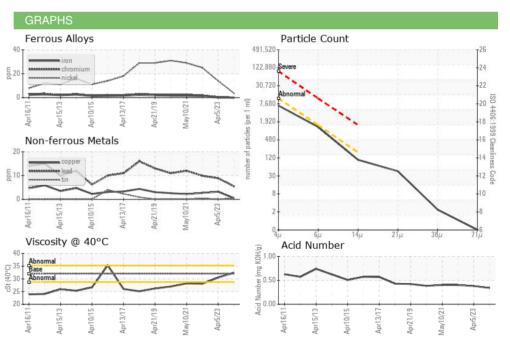
14k -	4μm 6μm					Λ
10k	al 14µm					1
8k 6k			•			
		/	1	$\backslash \land$	$\langle /$	~
4k -						
4k 2k 0k		April0/15	1-	Same and the second	May10/21	Apr5/23

() 0	KOH/g A	ASTM D8045				
				0.34	0.38	0.40
VISUAL		method	limit/base	current	history1	history2
White Metal sca	alar *	Visual	NONE	NONE	NONE	LIGHT
Yellow Metal sca	alar *	Visual	NONE	NONE	NONE	NONE
Precipitate sca	alar *	Visual	NONE	NONE	NONE	NONE
Silt sca	alar *	Visual	NONE	NONE	NONE	NONE
Debris sca	alar *	Visual	NONE	NONE	NONE	NONE
Sand/Dirt sca	alar *	Visual	NONE	NONE	NONE	NONE
Appearance sca	alar *	Visual	NORML	NORML	NORML	NORML
Odor sca	alar *	Visual	NORML	NORML	NORML	NORML
Emulsified Water sca	alar *	Visual	>0.1	NEG	NEG	NEG
Free Water sca	alar *	Visual		NEG	NEG	NEG
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C cSi	t A	ASTM D445	32	32.4	30.5	28.1
SAMPLE IMAGES		method	limit/base	current	history1	history2

Color

Bottom





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 AMTRAK Sample No. : WC0909891 1401 W STREET NE, HIGH SPEED RAIL 2ND FLOOR Received : 05 Apr 2024 Lab Number : 06140621 Tested : 08 Apr 2024 WASHINGTON, DC Unique Number : 10965429 Diagnosed : 08 Apr 2024 - Wes Davis US 20018 Test Package : MOB 2 Contact: MICHAEL PORTER Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. michael.porter@amtrak.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (202)870-1399 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Report Id: AMTRAK [WUSCAR] 06140621 (Generated: 04/08/2024 15:51:21) Rev: 1

Contact/Location: MICHAEL PORTER - AMTRAK

Page 2 of 2