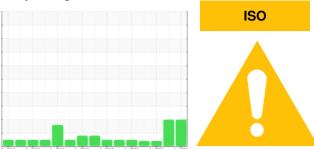


Area

OIL ANALYSIS REPORT

Sample Rating Trend



ALSTOM 3524 Component Hydraulic System Fluid ESSO UNIVIS N 32 (55 GAL)

DIAGNOSIS

A Recommendation

We recommend you service the filters on this component. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a high amount of particulates present in the oil.

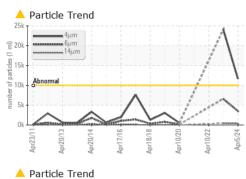
Fluid Condition

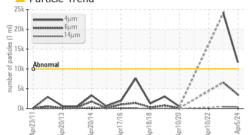
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

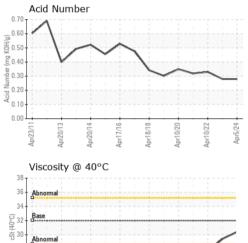
Sample Date Client Info 05 Apr 2024 12 Apr 2023 10 Apr 2022 Machine Age hrs Client Info 0 0 0 Oil Age hrs Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A ABNORMAL Sample Status method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron pp ASTM 05185m >10 26 27 39 Titanium ppm ASTM 05185m >10 21 0 0 Autominum ppm ASTM 05185m >10 2 0 0 Lead ppm ASTM 05185m >10 2 0 0 Autominum ppm ASTM 05185m 1 0 0 0 Lead	SAMPLE INFORMA	ATION	method	limit/base	current	history1	history2
Machine AgehrsClient Info0000Oil AgehrsClient InfoN/AN/AN/ASample StatusaaaABNORMALABNORMALABNORMALCONTAMINATIONmethodlimit/basecurrenthistory1history2WaterWC Method>0.1NEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM D518m>20323ChromiumppmASTM D518m>10112NickelppmASTM D518m>1026273SilverppmASTM D518m>10800AuminumppmASTM D518m>75668TinppmASTM D518m>75668TinppmASTM D518m>10<100AdminonyppmASTM D518m<1000AdminonyppmASTM D518m<1000AdminonyppmASTM D518m<1000AdminonyppmASTM D518m<1000AdminonyppmASTM D518m<1000AdminonyppmASTM D518m<1000AdminonyppmASTM D518m<1000AdminonyppmASTM D518m <th>Sample Number</th> <th></th> <th>Client Info</th> <th></th> <th>WC0667773</th> <th>WC0673238</th> <th>WC0592263</th>	Sample Number		Client Info		WC0667773	WC0673238	WC0592263
Oil Age hrs Client Info N/A N/A N/A Sample Status I I Image ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method Imit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM D5185m >20 3 2 3 Chromium ppm ASTM D5185m >10 1 1 2 Nickel ppm ASTM D5185m >10 26 27 39 Titanium ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >10 6 6 8 Tinn ppm ASTM D5185m >10 <1 0 0 Additum ppm ASTM D5185m <1 0 0 0 Additum ppm ASTM D5185m <1 0 0 0 Additum ppm ASTM D5185m	Sample Date		Client Info		05 Apr 2024	12 Apr 2023	10 Apr 2022
Oil Changed Client Info N/A N/A N/A Sample Status Image Status Image Status ABNORMAL ABNORMAL ABNORMAL CONTAMINATION 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 3 2 3 Chromium ppm ASTM D5185m >10 26 27 39 Titanium ppm ASTM D5185m >10 2 0 0 Silver ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >10 <1	Machine Age	hrs	Client Info		0	0	0
Sample StatusImage: statusABNORMALABNORMALABNORMALABNORMALABNORMALCONTAMINATIONmethodlimit/basecurrenthistory1history2WaterWC Method>0.1NEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM D5185n>20323ChromiumppmASTM D5185n>10112NickelppmASTM D5185n>10262739SilverppmASTM D5185n>10200AluminumppmASTM D5185n>108913CopperppmASTM D5185n>1041<1	Oil Age	hrs	Client Info		0	0	0
CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Water WC Method >0.1 NEG NEG NEG Water ppm ASTM D5185m >20 3 2 3 Chromium ppm ASTM D5185m >10 1 1 2 Nickel ppm ASTM D5185m >10 26 27 39 Titanium ppm ASTM D5185m >10 2 0 0 Aluminum ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >10 <1 <1 1 Antimony ppm ASTM D5185m >10 <1 0 0 Quadium ppm ASTM D5185m <1 0 0 0 Antimony ppm ASTM D5185m <1 0 0 0 <	Oil Changed		Client Info		N/A	N/A	N/A
Water WC Method >0.1 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10 1 1 2 Nickel ppm ASTM D5185m >10 26 27 39 Titanium ppm ASTM D5185m >10 26 27 39 Silver ppm ASTM D5185m >10 26 0 0 Lead ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >10 21 <1 <1 Antimony ppm ASTM D5185m >10 21 <1 <1 Antimony ppm ASTM D5185m >10 <1 <1 <1 Antimony ppm ASTM D5185m >10 <1 <1 <1 Antimony ppm ASTM D5185m >10 <1 <1 0 Addition ppm ASTM D5185m <1 0 0 0 Addition ppm ASTM D5185m <1 0 0 0 Addition ppm ASTM D5185m	Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 3 2 3 Chromium ppm ASTM D5185m >10 1 1 2 Nickel ppm ASTM D5185m >10 26 27 39 Titanium ppm ASTM D5185m >10 2 0 0 Silver ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >10 21 <1 <1 Copper ppm ASTM D5185m >10 <1 <1 <1 Cadmium ppm ASTM D5185m <10 <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 0 Adminony ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m <1 0 0	CONTAMINATION		method	limit/base	current	history1	history2
Iron ppm ASTM D5185m >20 3 2 3 Chromium ppm ASTM D5185m >10 1 1 2 Nickel ppm ASTM D5185m >10 26 27 39 Titanium ppm ASTM D5185m >10 26 27 39 Silver ppm ASTM D5185m >10 2 0 0 Auminum ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >10 <1 <1 <1 <1 Antimony ppm ASTM D5185m >10 <1 <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM D5185m 3 <1 0 0 Magnesium ppm ASTM D5185m 266 </th <th>Water</th> <th></th> <th>WC Method</th> <th>>0.1</th> <th>NEG</th> <th>NEG</th> <th>NEG</th>	Water		WC Method	>0.1	NEG	NEG	NEG
Chromium ppm ASTM D5185m >10 1 1 2 Nickel ppm ASTM D5185m >10 26 27 39 Titanium ppm ASTM D5185m >10 26 27 39 Silver ppm ASTM D5185m 0 0 0 Aluminum ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >75 6 6 8 8 Tin ppm ASTM D5185m >75 6 6 8 8 Tin ppm ASTM D5185m >10 <1 0 0 0 Cadmium ppm ASTM D5185m <1 0 0 0 0 Adminon ppm ASTM D5185m .1 0 0 0 0 Adminon ppm ASTM D5185m .3 <1 0 0 0 Manganese ppm	WEAR METALS		method	limit/base	current	history1	history2
NickelppmASTM D5185m>10262739TitaniumppmASTM D5185m000SilverppmASTM D5185m10200AluminumppmASTM D5185m>10200LeadppmASTM D5185m>75668TinppmASTM D5185m>75668TinppmASTM D5185m>10<1	Iron	ppm	ASTM D5185m	>20	3	2	3
Titanium ppm ASTM D5185m <1 0 0 Silver ppm ASTM D5185m >10 2 0 0 Aluminum ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >75 6 6 8 Tin ppm ASTM D5185m >10 <1	Chromium	ppm	ASTM D5185m	>10	1	1	2
Silver ppm ASTM D5185m 0 0 0 Aluminum ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >75 6 6 8 Tin ppm ASTM D5185m >10 <1	Nickel	ppm	ASTM D5185m	>10	26	27	39
Altminum ppm ASTM D5185m >10 2 0 0 Lead ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >75 6 6 8 Tin ppm ASTM D5185m >10 <1	Titanium	ppm	ASTM D5185m		<1	0	0
Lead ppm ASTM D5185m >10 8 9 13 Copper ppm ASTM D5185m >75 6 6 8 Tin ppm ASTM D5185m >10 <1	Silver	ppm	ASTM D5185m		0	0	0
Copper ppm ASTM D5185m >75 6 6 8 Tin ppm ASTM D5185m >10 <1	Aluminum	ppm	ASTM D5185m	>10	2	0	0
Tin ppm ASTM D5185m >10 <1 <1 <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 Boron ppm ASTM D5185m .1 0 0 0 Barium ppm ASTM D5185m .1 0 0 0 Magnese ppm ASTM D5185m .3 <1	Lead	ppm	ASTM D5185m	>10	8	9	13
Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m <1	Copper	ppm	ASTM D5185m	>75	6	6	8
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m Imit/base current history1 history2 Boron ppm ASTM D5185m .1 0 0 0 Barium ppm ASTM D5185m .1 0 0 0 Barium ppm ASTM D5185m .1 0 0 0 Barium ppm ASTM D5185m .1 0 0 0 Molybdenum ppm ASTM D5185m .3 <1 0 0 0 Magnesium ppm ASTM D5185m .3 <1 0 0 0 Calcium ppm ASTM D5185m 266 285 327 386 Zinc ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 20 2 2 2 Solicon ppm ASTM D5185m 20	Tin	ppm	ASTM D5185m	>10	<1	<1	<1
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m .1 0 0 0 Barium ppm ASTM D5185m .1 0 0 0 0 Barium ppm ASTM D5185m .3 <1 0 0 0 Manganese ppm ASTM D5185m .3 <1 0 0 0 Magnesium ppm ASTM D5185m 0 1 <1 0 0 Calcium ppm ASTM D5185m 74 46 52 58 Phosphorus ppm ASTM D5185m 266 285 327 386 Zinc ppm ASTM D5185m 266 287 327 2767 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D51	Antimony	ppm	ASTM D5185m				
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m .1 0 0 0 Barium ppm ASTM D5185m .3 <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m .1 0 0 0 Barium ppm ASTM D5185m .3 <1	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m .3 <1 0 0 Manganese ppm ASTM D5185m .3 <1 0 0 Magnesium ppm ASTM D5185m 0 1 <1 0 Calcium ppm ASTM D5185m 74 46 52 58 Phosphorus ppm ASTM D5185m 266 285 327 386 Zinc ppm ASTM D5185m 266 285 327 2767 Sulfur ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 22778 2207 2767 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m .3 <1	Boron	ppm	ASTM D5185m	.1	0	0	0
Maganese ppm ASTM D5185m <1 0 0 Magnesium ppm ASTM D5185m 0 1 <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 0 1 <1 0 Calcium ppm ASTM D5185m 74 46 52 58 Phosphorus ppm ASTM D5185m 266 285 327 386 Zinc ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 2278 2207 2767 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 2 2 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 <1	Molybdenum	ppm	ASTM D5185m	.3	<1	0	0
Calcium ppm ASTM D5185m 74 46 52 58 Phosphorus ppm ASTM D5185m 266 285 327 386 Zinc ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 2278 2207 2767 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 2 2 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 <1	Manganese	ppm	ASTM D5185m		<1	0	0
Phosphorus ppm ASTM D5185m 266 285 327 386 Zinc ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 3278 2207 2767 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 2 2 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 <1		ppm	ASTM D5185m	0	1	<1	0
Phosphorus ppm ASTM D5185m 266 285 327 386 Zinc ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 3278 2207 2767 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 2 2 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 <1	-	ppm	ASTM D5185m	74	46	52	58
Zinc ppm ASTM D5185m 338 443 437 449 Sulfur ppm ASTM D5185m 338 2278 2207 2767 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 2 2 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 <1			ASTM D5185m	266	285	327	386
SulfurppmASTM D5185m227822072767CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>20222SodiumppmASTM D5185m>20101PotassiumppmASTM D5185m>201<1			ASTM D5185m	338	443	437	449
Silicon ppm ASTM D5185m >20 2 2 2 2 Sodium ppm ASTM D5185m 1 0 1 1 0 1 Potassium ppm ASTM D5185m >20 1 <1					2278		2767
Sodium ppm ASTM D5185m 1 0 1 Potassium ppm ASTM D5185m >20 1 <1 0 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >10000 ▲ 11660 △ 24092 Particles >6µm ASTM D7647 >1300 ▲ 3485 ▲ 6588 Particles >14µm ASTM D7647 >160 ▲ 366 ▲ 448 Particles >21µm ASTM D7647 >10 5 6 Particles >38µm ASTM D7647 >10 5 6 Particles >71µm ASTM D7647 >3 0 0	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 1 0 1 Potassium ppm ASTM D5185m >20 1 <1 0 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >10000 ▲ 11660 ▲ 24092 Particles >6µm ASTM D7647 >1300 ▲ 3485 ▲ 6588 Particles >14µm ASTM D7647 >160 ▲ 3666 ▲ 448 Particles >21µm ASTM D7647 >10 5 6 Particles >38µm ASTM D7647 >10 5 6 Particles >71µm ASTM D7647 >3 0 0	Silicon	ppm	ASTM D5185m	>20	2	2	2
Potassium ppm ASTM D5185m >20 1 <1 0 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >10000 11660 24092 Particles >6µm ASTM D7647 >1300 3485 6588 Particles >14µm ASTM D7647 >160 366 4448 Particles >21µm ASTM D7647 >40 114 88 Particles >38µm ASTM D7647 >10 5 6 Particles >71µm ASTM D7647 >3 0 0			ASTM D5185m		1	0	1
Particles >4μm ASTM D7647 >10000 ▲ 11660 ▲ 24092 Particles >6μm ASTM D7647 >1300 ▲ 3485 ▲ 6588 Particles >14μm ASTM D7647 >160 ▲ 366 ▲ 448 Particles >14μm ASTM D7647 >160 ▲ 366 ▲ 448 Particles >21μm ASTM D7647 >40 ▲ 114 ▲ 88 Particles >38μm ASTM D7647 >10 5 6 Particles >71μm ASTM D7647 >3 0 0				>20	1	<1	0
Particles >6µm ASTM D7647 >1300 A 3485 6588 Particles >14µm ASTM D7647 >160 A 366 4 448 Particles >21µm ASTM D7647 >40 A 114 A 88 Particles >38µm ASTM D7647 >10 5 6 Particles >71µm ASTM D7647 >3 0 0	FLUID CLEANLINE	SS	method	limit/base	current	history1	history2
Particles >14μm ASTM D7647 >160 A 366 448 Particles >21μm ASTM D7647 >40 A 114 A 88 Particles >38μm ASTM D7647 >10 5 6 Particles >71μm ASTM D7647 >3 0 0	Particles >4µm		ASTM D7647	>10000	<u> </u>	A 24092	
Particles >21μm ASTM D7647 >40 114 88 Particles >38μm ASTM D7647 >10 5 6 Particles >71μm ASTM D7647 >3 0 0	Particles >6µm		ASTM D7647	>1300	A 3485	▲ 6588	
Particles >21μm ASTM D7647 >40 ▲ 114 ▲ 88 Particles >38μm ASTM D7647 >10 5 6 Particles >71μm ASTM D7647 >3 0 0	Particles >14µm				A 366	4 48	
Particles >38μm ASTM D7647 >10 5 6 Particles >71μm ASTM D7647 >3 0 0			ASTM D7647	>40		▲ 88	
Particles >71μm ASTM D7647 >3 0							
	Particles >71µm						
	Oil Cleanliness		ISO 4406 (c)	>20/17/14	21/19/16	▲ 22/20/16	



OIL ANALYSIS REPORT







28

24

Apr23/11

Apr20/13

Apr20/14

Apr17/16

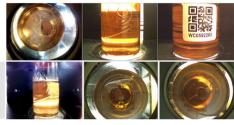
Apr18/18

Apr10/20

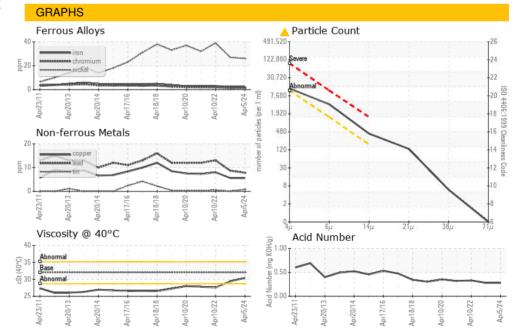
Apr10/22

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		0.28	0.28	0.33
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	🔺 MODER
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	32	30.4	29.4	27.6
SAMPLE IMAGES	S	method	limit/base	current	history1	history2

Color



Bottom



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 AMTRAK : WC0667773 1401 W STREET NE, HIGH SPEED RAIL 2ND FLOOR Sample No. Received : 08 Apr 2024 Lab Number : 06141234 Tested : 09 Apr 2024 WASHINGTON, DC Unique Number : 10966042 Diagnosed : 10 Apr 2024 - Don Baldridge 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] 06141234 (Generated: 04/10/2024 17:40:17) Rev: 1

Contact/Location: MICHAEL PORTER - AMTRAK

Page 2 of 2