

# **OIL ANALYSIS REPORT**



#### Machine Id I-09 Component Wind Turbine Gearbox Fluid ROYAL PURPLE SYNFILM 320 (65 GAL)

# DIAGNOSIS

# A Recommendation

We recommend you service the filters on this component. Resample at the next service interval to monitor. We were unable to perform a particle count due to a high concentration of particles present in this sample.

# Wear

All component wear rates are normal.

#### Contamination

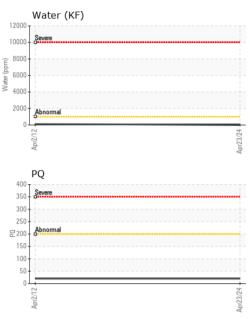
There is a moderate amount of visible silt present in the sample.

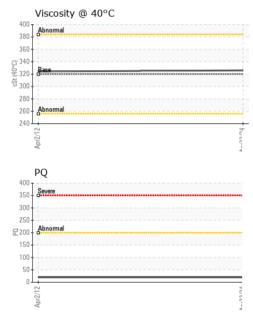
#### Fluid Condition

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

Sample Date         Client Info         23 Apr 2024         02 Apr 2012            Machine Age         hrs         Client Info         0         0            Oil Age         hrs         Client Info         0         0            Oil Changed         Client Info         N/A         N/A            Sample Status         Imethod         Imit/base         current         history1         history2           PQ         ASTM D5185m         >200         8         12            Iron         ppm         ASTM D5185m         >3         0         0            Nickel         ppm         ASTM D5185m         >3         0         0            Aluminum         ppm         ASTM D5185m         >10         0         0            Aluminum         ppm         ASTM D5185m         >10         1         0            Aluminum         ppm         ASTM D5185m         >5          0            Aluminum         ppm         ASTM D5185m         >10         1         0            Atominum         ppm	SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Machine AgehrsClient Info00Oil AgehrsClient InfoN/AN/ASample Statusaannon and antipation antipation and antipation a	Sample Number		Client Info		MHI026438	RP107480	
Oil Age         hrs         Client Info         N/A         N/A            Sample Status         Client Info         N/A         N/A         N/A            WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D5185m         >200         20         20.0            ron         ppm         ASTM D5185m         >200         8         12            Chromium         ppm         ASTM D5185m         >30         0         0            Nickel         ppm         ASTM D5185m         >10         0         0            Silver         ppm         ASTM D5185m         >10         0         0            Aluminum         ppm         ASTM D5185m         >10         0             Aluminum         ppm         ASTM D5185m         >5         6         5            Capper         ppm         ASTM D5185m         >5          0            Antimony         ppm         ASTM D5185m         >5          0	Sample Date		Client Info		23 Apr 2024	02 Apr 2012	
Oil ChangedClient InfoN/AN/AN/ASample StatusImage of the statusImage of the statusImage of the statusNORMALWEAR METALSmethodImal/basecurrenthistory1history2PQASTM D6184>2002020.0ChromiumppmASTM D6185>3000NickelppmASTM D6185>3000NickelppmASTM D6185>3002AuminumppmASTM D6185>3002LeadppmASTM D6185>5565CopperppmASTM D6185>550AntimonyppmASTM D5185>50AdminumppmASTM D5185>50AntimonyppmASTM D5185000AdminumppmASTM D5185000AdminumppmASTM D51850100AdminumppmASTM D51850100AdminumppmASTM D51850100AdminumppmASTM D51850100AdminumppmASTM D5185120AdminumppmASTM D5185120	Machine Age	hrs	Client Info		0	0	
Sample Status         method         Imil/base         current         history1         history2           PQ         ASTM D6184         >200         20         20.0            Iron         ppm         ASTM D6184         >200         8         12            Iron         ppm         ASTM D5185m         >3         0         0            Nickel         ppm         ASTM D5185m         >3         0         0            Silver         ppm         ASTM D5185m         >10         0         0            Silver         ppm         ASTM D5185m         >10         0         4            Copper         ppm         ASTM D5185m         >10         41          0            Antimony         ppm         ASTM D5185m         >10         <1	Oil Age	hrs	Client Info		0	0	
WEAR METALS         method         limil/base         current         history1         history2           PQ         ASTM D8184         >200         8         12            Iron         ppm         ASTM D5185m         >33         0         0            Nickel         ppm         ASTM D5185m         >33         <1	Oil Changed		Client Info		N/A	N/A	
PQ         ASTM D8184         >200         20         20.0            Iron         ppm         ASTM D5185m         >200         8         12            Chromium         ppm         ASTM D5185m         >3         <1	Sample Status				ABNORMAL	NORMAL	
Iron         ppm         ASTM D5185m         >200         8         12            Chromium         ppm         ASTM D5185m         >3         0         0            Nickel         ppm         ASTM D5185m         >10         0         0            Silver         ppm         ASTM D5185m         >10         0         0            Aluminum         ppm         ASTM D5185m         >10         0         2            Aluminum         ppm         ASTM D5185m         >15         0         4            Aluminum         ppm         ASTM D5185m         >10         <1	WEAR METALS		method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >3         0         0            Nickel         ppm         ASTM D5185m         >3         <1	PQ		ASTM D8184	>200	20	20.0	
Nickel         ppm         ASTM D5185m         >3         <1         <1            Titanium         ppm         ASTM D5185m         >10         0         0            Silver         ppm         ASTM D5185m         >30         0         2            Aluminum         ppm         ASTM D5185m         >30         0         2            Copper         ppm         ASTM D5185m         >30         0         2            Copper         ppm         ASTM D5185m         >30         0         2            Copper         ppm         ASTM D5185m         >10         <11	Iron	ppm	ASTM D5185m	>200	8	12	
Nickel         ppm         ASTM D5185m         >3         <1         <1            Titanium         ppm         ASTM D5185m         >10         0         0            Silver         ppm         ASTM D5185m         >30         0         2            Aluminum         ppm         ASTM D5185m         >30         0         2            Copper         ppm         ASTM D5185m         >15         0         4            Copper         ppm         ASTM D5185m         >75         6         5            Copper         ppm         ASTM D5185m         >10         <1	Chromium	ppm	ASTM D5185m	>3	0	0	
TitaniumppmASTM D5185m>1000SilverppmASTM D5185m>3002AluminumppmASTM D5185m>3002LeadppmASTM D5185m>1004CopperppmASTM D5185m>10<1	Nickel		ASTM D5185m	>3	<1	<1	
Silver         ppm         ASTM D5185m         >30         0            Aluminum         ppm         ASTM D5185m         >30         0         2            Lead         ppm         ASTM D5185m         >15         0         4            Copper         ppm         ASTM D5185m         >15         0         4            Antimony         ppm         ASTM D5185m         >10         <1	Titanium	• •					
Aluminum         ppm         ASTM D5185m         >30         0         2							
Lead         ppm         ASTM D5185m         >15         0         4            Copper         ppm         ASTM D5185m         >75         6         5            Tin         ppm         ASTM D5185m         >10         <1				>30	-		
Copper         ppm         ASTM D5185m         >75         6         5            Tin         ppm         ASTM D5185m         >10         <1					-		
Tin         ppm         ASTM D5185m         >10         <1         0            Antimony         ppm         ASTM D5185m         >5          0            Vanadium         ppm         ASTM D5185m         0         0            Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <10		• •			-		
Antimony         ppm         ASTM D5185m         >5          0            Vanadium         ppm         ASTM D5185m         0         0            Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1					-		
Vanadium         ppm         ASTM D5185m         0         0            Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1							
Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1            Barium         ppm         ASTM D5185m         0         109            Molybdenum         ppm         ASTM D5185m         0         109            Maganese         ppm         ASTM D5185m         90         1         45            Magnesium         ppm         ASTM D5185m         90         1         45            Calcium         ppm         ASTM D5185m         90         1         451            Calcium         ppm         ASTM D5185m         90         1         451            Sulfur         ppm         ASTM D5185m         12         451            Sulfur         ppm         ASTM D5185m         21         97            Sodium         ppm         ASTM D5185m         >20         3         0            Sodium         ppm         AST				>0			
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1					-		
Boron         ppm         ASTM D5185m         0         <1            Barium         ppm         ASTM D5185m         0         109            Molybdenum         ppm         ASTM D5185m         0         109            Manganese         ppm         ASTM D5185m         0         1         0            Magnesium         ppm         ASTM D5185m         90         1         45            Calcium         ppm         ASTM D5185m         90         1         0            Phosphorus         ppm         ASTM D5185m         90         1         0            Sulfur         ppm         ASTM D5185m         12         451            Sulfur         ppm         ASTM D5185m         19900         15694            Sulfur         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >20         3         0            Potassium         ppm         ASTM D6304         >0.1         0.001         0.012            pp	Cadmium	ppm	ASTM DS185m		U	-	
Barium         ppm         ASTM D5185m         <1	ADDITIVES		method	limit/base	current	history1	history2
Nolybdenum         ppm         ASTM D5185m         0         109            Manganese         ppm         ASTM D5185m         90         1         45            Magnesium         ppm         ASTM D5185m         90         1         45            Calcium         ppm         ASTM D5185m         90         1         45            Calcium         ppm         ASTM D5185m         90         1         0            Phosphorus         ppm         ASTM D5185m         12         451            Sulfur         ppm         ASTM D5185m         12         451            Sulfur         ppm         ASTM D5185m         21         97            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >430         6         0            Sodium         ppm         ASTM D5185m         >20         3         0            Potassium         ppm         ASTM D6304         >0.1         0.001         0.012 <t< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td></td><td>0</td><td>&lt;1</td><td></td></t<>	Boron	ppm	ASTM D5185m		0	<1	
Maganese         ppm         ASTM D5185m         <1         0            Magnesium         ppm         ASTM D5185m         90         1         455            Calcium         ppm         ASTM D5185m         90         1         0            Phosphorus         ppm         ASTM D5185m         12         451            Zinc         ppm         ASTM D5185m         21         97            Sulfur         ppm         ASTM D5185m         19900         15694            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >430         6         0            Sodium         ppm         ASTM D5185m         >20         3         0            Water         %         ASTM D5185m         >20         3         0            ppm Water         pm         ASTM D7647         >100         5         120	Barium	ppm	ASTM D5185m		<1	0	
Magnesium         ppm         ASTM D5185m         90         1         45            Calcium         ppm         ASTM D5185m         1         0            Phosphorus         ppm         ASTM D5185m         12         451            Zinc         ppm         ASTM D5185m         21         97            Sulfur         ppm         ASTM D5185m         19900         15694            Solicon         ppm         ASTM D5185m         >430         6         0            Sodium         ppm         ASTM D5185m         >20         3         0            Vater         %         ASTM D6304         >0.1         0.0001         0.012            ppm Water         ppm         ASTM D7647         >1000         5         120            Particles >4µm         ASTM D764	Molybdenum	ppm	ASTM D5185m		0	109	
Calcium         ppm         ASTM D5185m         1         0            Phosphorus         ppm         ASTM D5185m         12         451            Zinc         ppm         ASTM D5185m         21         97            Sulfur         ppm         ASTM D5185m         19900         15694            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >20         3         0            Potassium         ppm         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2	Manganese	ppm	ASTM D5185m		<1	0	
Phosphorus         ppm         ASTM D5185m         12         451            Zinc         ppm         ASTM D5185m         21         97            Sulfur         ppm         ASTM D5185m         19900         15694            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >20         3         0            Potassium         ppm         ASTM D6304         >0.1         0.001         0.012            Water         %         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          1705 </td <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>90</td> <td>1</td> <td>45</td> <td></td>	Magnesium	ppm	ASTM D5185m	90	1	45	
Zinc         ppm         ASTM D5185m         21         97            Sulfur         ppm         ASTM D5185m         19900         15694            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         6         0            Potassium         ppm         ASTM D5185m         >20         3         0            Water         %         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          1705            Particles >6µm         ASTM D7647         >640          158	Calcium	ppm	ASTM D5185m		1	0	
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CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         6         0            Potassium         ppm         ASTM D5185m         >20         3         0            Water         %         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          1705            Particles >6µm         ASTM D7647         >5000          928            Particles >14µm         ASTM D7647         >640          158            Particles >21µm         ASTM D7647         >160          8            Particles >38µm         ASTM D7647         40          8	Zinc	ppm	ASTM D5185m		21	97	
Silicon         ppm         ASTM D5185m         >+30         6         0            Sodium         ppm         ASTM D5185m         >+30         1         0            Potassium         ppm         ASTM D5185m         >20         3         0            Water         %         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          1705            Particles >6µm         ASTM D7647         >640          158            Particles >14µm         ASTM D7647         >640          158            Particles >21µm         ASTM D7647         >40          8            Particles >38µm         ASTM D7647         >40          8            Particles >71µm         ASTM D7647         >10          0	Sulfur	ppm	ASTM D5185m		19900	15694	
Sodium         ppm         ASTM D5185m         1         0            Potassium         ppm         ASTM D5185m         >20         3         0            Water         %         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          1705            Particles >6µm         ASTM D7647         >5000          928            Particles >14µm         ASTM D7647         >640          158            Particles >14µm         ASTM D7647         >160          53            Particles >38µm         ASTM D7647         >40          8            Particles >71µm         ASTM D7647         >10          0	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium         ppm         ASTM D5185m         1         0            Potassium         ppm         ASTM D5185m         >20         3         0            Water         %         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          1705            Particles >6µm         ASTM D7647         >5000          928            Particles >14µm         ASTM D7647         >640          158            Particles >14µm         ASTM D7647         >160          53            Particles >38µm         ASTM D7647         >40          8            Particles >71µm         ASTM D7647         >10          0	Silicon	ppm	ASTM D5185m	>+30	6		
Potassium         ppm         ASTM D5185m         >20         3         0            Water         %         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          928            Particles >6µm         ASTM D7647         >640          158            Particles >14µm         ASTM D7647         >160          53            Particles >21µm         ASTM D7647         >40          8            Particles >38µm         ASTM D7647         >10          0							
Water         %         ASTM D6304         >0.1         0.001         0.012            ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647          1705            Particles >6µm         ASTM D7647         >5000          928            Particles >14µm         ASTM D7647         >640          158            Particles >21µm         ASTM D7647         >160          8            Particles >38µm         ASTM D7647         >40          8            Particles >71µm         ASTM D7647         >10          0				>20			
ppm Water         ppm         ASTM D6304         >1000         5         120            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647          1705            Particles >6µm         ASTM D7647         >5000          928            Particles >14µm         ASTM D7647         >640          158            Particles >14µm         ASTM D7647         >160          53            Particles >21µm         ASTM D7647         >40          8            Particles >38µm         ASTM D7647         >10          0					-		
FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647          1705            Particles >6μm         ASTM D7647         >5000          928            Particles >14μm         ASTM D7647         >640          158            Particles >14μm         ASTM D7647         >160          53            Particles >21μm         ASTM D7647         >40          8            Particles >38μm         ASTM D7647         >10          0	ppm Water						
Particles >4μm         ASTM D7647          1705            Particles >6μm         ASTM D7647         >5000          928            Particles >14μm         ASTM D7647         >640          158            Particles >14μm         ASTM D7647         >160          53            Particles >21μm         ASTM D7647         >40          8            Particles >38μm         ASTM D7647         >10          0			method			history1	history2
Particles >6μm         ASTM D7647         >5000          928            Particles >14μm         ASTM D7647         >640          158            Particles >21μm         ASTM D7647         >160          53            Particles >21μm         ASTM D7647         >40          8            Particles >38μm         ASTM D7647         >10          0							
Particles >14μm         ASTM D7647         >640          158            Particles >21μm         ASTM D7647         >160          53            Particles >38μm         ASTM D7647         >40          8            Particles >71μm         ASTM D7647         >10          0				>5000			
Particles >21μm         ASTM D7647         >160          53            Particles >38μm         ASTM D7647         >40          8            Particles >71μm         ASTM D7647         >10          0							
Particles >38μm         ASTM D7647         >40          8            Particles >71μm         ASTM D7647         >10          0							
Particles >71μm         ASTM D7647         >10          0							
Uli Geaniness         ISO 4406 (c)         >/19/16          18/17/14	•						
	Oil Cleanliness		ISO 4406 (c)	>/19/16		18/17/14	







# **OIL ANALYSIS REPORT**

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FLUID DEGRA		method	limit/base	current	history1	history
Acid Number (AN	N) mg KOH/g	ASTM D8045		0.38	0.629	
VISUAL		method	limit/base	current	history1	history
White Metal	scalar	*Visual	NONE	NONE	NONE	
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
Precipitate	scalar	*Visual	NONE	NONE	NONE	
Silt	scalar	*Visual	NONE	A MODER	NONE	
Debris	scalar	*Visual	NONE	NONE	VLITE	
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Appearance	scalar	*Visual	NORML	NORML	NORML	
Odor	scalar	*Visual	NORML	NORML	NORML	
Emulsified Water	r scalar	*Visual	>0.1	NEG	NEG	
Free Water	scalar	*Visual		NEG	NEG	
FLUID PROPE	ERTIES	method	limit/base	current	history1	history
Visc @ 40°C	cSt	ASTM D445	320	326	324.2	
SAMPLE IMAG	GES	method	limit/base	current	history1	history
Color					no image	no image
Bottom					no image	no image
Non-ferrous Me			Apr23/24			
Edd copper lead tin	1488481488481488481488488488488488488488	AL COMPANY OF A DESCRIPTION	Apr23/24			
Viscosity @ 40	°C			Acid Number		
400 Abnormal			()(Hox) Hox) But 4.00 Page 2.00 NV Page 0.00	T:		
© 350 - 응 장 300 -				Severe		
र्खे 300 <b>-</b>			ag g 2.00	Abnormal		
250 Abnormal			2 PB 0.00	Base	*****	
Apr2/12			Apr23/24	Apr2/12		
Ap			Apr	Ar		
<ul> <li>WearCheck USA -</li> <li>: MHI026438</li> <li>: 06204588</li> <li>: 11072049</li> </ul>	- 501 Madiso Recei Teste Diagr	ived :10 d :13	, NC 27513 ) Jun 2024 ) Jun 2024 Jun 2024 - Jonat	-	) WTG - WHITE DE W⊦	ER SITE - MPS PO BOX IITE DEER US 79

To discuss this sample report, contact Customer Service at 1-800-237-1369.

T: (806)883-1051 \* - 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) F: (806)883-2004

Report Id: MITWHI [WUSCAR] 06204588 (Generated: 06/15/2024 07:30:37) Rev: 1

Certificate 12367

Contact/Location: WESLEY CAMPBELL - MITWHI

wesley.campbell@diamondwtg.com