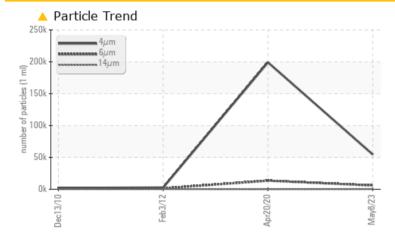


Machine Id **F-09** Component **Wind Turbine Gearbox** Fluid **ROYAL PURPLE SYNFILM GT 320 (65 GAL)**

COMPONENT CONDITION SUMMARY



RECOMMENDATION

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil. Resample at the next service interval to monitor.

PROBLEMATIC TE	EST RESULTS			
Sample Status		MARGINAL	ABNORMAL	ABNORMAL
Particles >6µm	ASTM D7647 >5000	🔺 5939	1 3484	1 487
Oil Cleanliness	ISO 4406 (c) >/19/	16 🔺 23/20/14	🔺 25/21/13	1 9/18/15

Customer Id: MITWHI Sample No.: MHI021611 Lab Number: 06016365 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 <u>jhester@wearcheckusa.com</u>

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

RECOMMENDE	O ACTIONS			
Action	Status	Date	Done By	Description
Change Filter			?	Replace filter e and cleanlines
Resample			?	Replace filter e and cleanlines

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil.

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil.

HISTORICAL DIAGNOSIS



20 Apr 2020 Diag: Doug Bogart

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil. Resample at the next service interval to monitor.All component wear rates are normal. There is a high amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



view report

03 Feb 2012 Diag: Jonathan Hester



We recommend you service the filters on this component. Resample at the next service interval to monitor.All component wear rates are normal. There is a high amount of particulates present in the oil. The condition of oil is suitable for further service.

13 Dec 2010 Diag: Don Baldridge





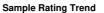
Resample at the next service interval to monitor.All component wear rates are normal. The amount and size of particulates present in the system is acceptable. There is no indication of any contamination in the component. The condition of oil is suitable for further service.

view report

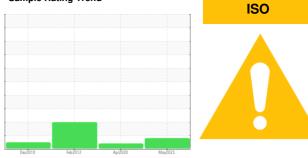




OIL ANALYSIS REPORT



SAMPLE INFORMATION method limit/base



current

history1

historv2

F-09 Component Wind Turbine Gearbox Fluid ROYAL PURPLE SYNFILM GT 320 (65 GAL)

DIAGNOSIS

Machine Id

Recommendation

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

Fluid Condition

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

	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		MHI021611	MHI023648	RP107430
Sample Date		Client Info		08 May 2023	20 Apr 2020	03 Feb 2012
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		0	98294	0
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				MARGINAL	ABNORMAL	ABNORMAL
WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184	>200	13	17	19.0
Iron	ppm	ASTM D5185m	>200	19	23	7
Chromium	ppm	ASTM D5185m	>3	<1	<1	0
Nickel	ppm	ASTM D5185m	>3	0	<1	0
Titanium	ppm	ASTM D5185m	>10	<1	0	0
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>30	2	<1	1
Lead	ppm	ASTM D5185m	>15	0	<1	0
Copper	ppm	ASTM D5185m	>75	6	5	<u>▲</u> 5
Tin	ppm	ASTM D5185m	>10	0	0	0
Antimony	ppm	ASTM D5185m	>5		0	<1
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		0	<1	0
Barium	ppm	ASTM D5185m		0	<1	0
Molybdenum	ppm	ASTM D5185m		5	6	92
Manganese	ppm	ASTM D5185m		0	<1	0
Magnesium	ppm	ASTM D5185m	90	10	1	63
Calcium	ppm	ASTM D5185m	00	0	<1	2
Phosphorus		ASTM D5185m		0	26	287
				0		
	ppm			0		
Zinc	ppm	ASTM D5185m		0	0	67
Zinc Sulfur	ppm ppm	ASTM D5185m ASTM D5185m		19744	0 12448	67 15298
Zinc Sulfur CONTAMINANTS	ppm ppm	ASTM D5185m ASTM D5185m method	limit/base	19744 current	0 12448 history1	67 15298 history2
Zinc Sulfur CONTAMINANTS Silicon	ppm ppm	ASTM D5185m ASTM D5185m method ASTM D5185m		19744 current 4	0 12448 history1 4	67 15298 history2 3
Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	>+30	19744 current 4 0	0 12448 history1 4 <1	67 15298 history2 3 <1
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m	>+30 >20	19744 current 4 0 1	0 12448 history1 4 <1 0	67 15298 history2 3 <1 0
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	>+30 >20	19744 current 4 0	0 12448 history1 4 <1	67 15298 history2 3 <1
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m	>+30 >20	19744 current 4 0 1	0 12448 history1 4 <1 0	67 15298 history2 3 <1 0
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm % ppm	ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304	>+30 >20 >0.1	19744 current 4 0 1 0.008	0 12448 history1 4 <1 0 0.005	67 15298 history2 3 <1 0 0.009
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN	ppm ppm ppm ppm ppm ppm % ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304	>+30 >20 >0.1 >1000	19744 current 4 0 1 0.008 81	0 12448 history1 4 <1 0 0.005 58.6	67 15298 history2 3 <1 0 0.009 90
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm	ppm ppm ppm ppm ppm ppm % ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 method	>+30 >20 >0.1 >1000 limit/base	19744 current 4 0 1 0.008 81 current	0 12448 history1 4 <1 0 0.005 58.6 history1	67 15298 history2 3 <1 0 0.009 90 history2
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm	ppm ppm ppm ppm ppm ppm % ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D6304	>+30 >20 >0.1 >1000 limit/base	19744 current 4 0 1 0.008 81 current 54564	0 12448 history1 4 <1 0 0.005 58.6 history1 199074	67 15298 history2 3 <1 0 0.009 90 history2 2730
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm	ppm ppm ppm ppm ppm ppm % ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647	>+30 >20 >0.1 >1000 limit/base >5000 >640	19744 current 4 0 1 0.008 81 current 54564 ▲ 5939	0 12448 history1 4 <10 0 0.005 58.6 history1 199074 ▲ 13484	67 15298 history2 3 <1 0 0.009 90 history2 2730 ▲ 1487
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm Particles >21µm	ppm ppm ppm ppm ppm ppm % ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 ASTM D7647	>+30 >20 >0.1 >1000 limit/base >5000 >640	19744 current 4 0 1 0.008 81 current 54564 ▲ 5939 137	0 12448 history1 4 <1 0 0.005 58.6 history1 199074 ▲ 13484 45	67 15298 history2 3 <10 0.009 90 history2 2730 ▲ 1487 ▲ 253
Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water	ppm ppm ppm ppm ppm ppm % ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647	>+30 >20 >0.1 >1000 limit/base >5000 >640 >160 >40	19744 current 4 0 1 0.008 81 current 54564 5939 137 21	0 12448 history1 4 <1 0 0.005 58.6 bistory1 199074 13484 45 6	67 15298 history2 3 <10 0.009 90 history2 2730 ▲ 1487 ▲ 253 ▲ 85



OIL ANALYSIS REPORT

			FLUID DEGRAD	AHON	method	limit/base	current	history1	histor
4μm 6μm		~	Acid Number (AN)	mg KOH/g	ASTM D8045	0.25	0.39	0.416	0.497
алаанаана ттµ/ПП	/		VISUAL		method	limit/base	current	history1	histor
			White Metal	scalar	*Visual	NONE	LIGHT	LIGHT	NONE
			Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		,,	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
	/12	/20	_	scalar	*Visual	NONE	LIGHT	NONE	NONE
	Feb3/12	Apr20/20 Mav8/23	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
			Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
/ater (KF)			Appearance	scalar	*Visual	NORML	NORML	NORML	NORM
evere			Odor	scalar	*Visual	NORML	NORML	NORML	NORM
			Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
			Free Water	scalar	*Visual		NEG	NEG	NEG
			FLUID PROPER	FIES	method	limit/base	current	history1	histo
nal			Visc @ 40°C	cSt	ASTM D445	320	318	304	334.0
	Feb3/12 -	Apr20/20	SAMPLE IMAGE	S	method	limit/base	current	history1	histo
	Feb	Apr2 Mav6					202		
			0.1						
			Color						no ima
ere									
							13		
ormal			Bottom				(+) (O+)		no ima
						N. Contraction of the second sec		1-22	
						1			
			GRAPHS						
	Feb3/12	Apr20/20 Mav8/23	Ferrous Alloys				Particle Count		
	ш.	W AE	30 iron		-	491,520			
/ater (KF)			20 - Chromium	/		122,880			
-			E 10			30,720	1.		
weid			0			╤ 7,680	1.		
			Dec13/10 Feb3/12		Apr20/20	(per 1 ml) (1900	1.		
			Pec		Api	May8/23 100011 May8/23 10011 May8/23	\` \`	S	
			Non-ferrous Meta	s		otured 480		\	
normal			10 copper			jo age 120			
		-	E 5-						
	Feb3/12	Apr20/20							
		A	0			8	Seve enal	/	
cosity @ 40°	°C		Dec13/10 Feb3/12		Apr20/20	May8/23			
rmal	1	1			Ap	≥ 04	μ 6μ	14µ 21µ	38µ
			Viscosity @ 40°C				Acid Number	6	
	-				1	0/H0)	Ι.		
			다 350 응 행 300			0.04(d) 4.00 9.0.2 µmper 9.0.0 Vmpper 9.0.0 Vmpper 9.0	Severe		
			중 300 -			e 2.00	Abnormal		
rmal			Abnormal			S S S S S S S S S S S S S S S S S S S	Base		
					0/20	May8/23	3/10	Feb3/12 -	
	Feb3/12	Apr20/20	Dec13/10 Feb3/12		Apr20/20	May	Dec13/10	Feb3/12 Aor20/20	
		Laboratory Sample No. Lab Number		501 Madis Received Diagnos	: 24	ry, NC 27513 Nov 2023 Nov 2023	DIAMONI) WTG - WHITE DEI W⊦	er site - 1 Po Bo Iite Dei
	ACCREDITED			•					
	A C C R E D I T E D	Unique Numbe	r : 10755509			athan Hester		_	US 7
	Certificate L2367	Unique Numbe Test Package		ests: KF,	PQ, PrtCour	nt)		Contact: WESLE	EY CAMP

Contact/Location: WESLEY CAMPBELL - MITWHI