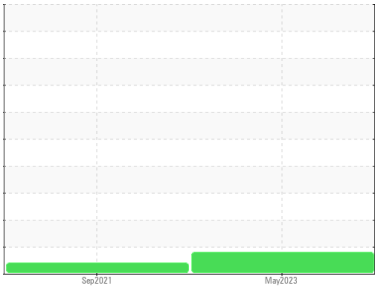
DIAMOND WTG ENGINEERING & SERVICES, INC.
a group company of MITSUBISHI HEAVY INDUSTRIES, LTD.

PROBLEM SUMMARY

Sample Rating Trend



SEDIMENT

Machine Id
I-04
Component
Wind Turbine Gearbox
Fluid
ROYAL PURPLE SYNFILM GT 320 (--- GAL)

COMPONENT CONDITION SUMMARY

No relevant graphs to display

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.

PROBLEMATIC TEST RESULTS

Sample Status				**ABNORMAL**	ABNORMAL	---
Silt	scalar	*Visual	NONE	▲ **MODER**	NONE	---

Customer Id: MITWHI
Sample No.: MHI021599
Lab Number: 06016349
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
jhester@wearcheckusa.com

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

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Filter	---	---	?	We recommend you service the filters on this component.
Alert	---	---	?	We were unable to perform a particle count due to a high concentration of particles present in this sample.

HISTORICAL DIAGNOSIS

20 Sep 2021 Diag: Jonathan Hester

ISO

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

view report

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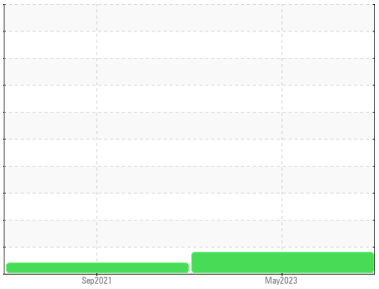
OIL ANALYSIS REPORT

Sample Rating Trend



SEDIMENT

Machine Id
I-04
Component
Wind Turbine Gearbox
Fluid
ROYAL PURPLE SYNFILM GT 320 (--- GAL)

DIAGNOSIS

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 INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**MHI021599**	MHI017351	---
Sample Date		Client Info		**15 May 2023**	20 Sep 2021	---
Machine Age	hrs	Client Info		**0**	0	---
Oil Age	hrs	Client Info		**0**	0	---
Oil Changed		Client Info		**N/A**	N/A	---
Sample Status				**ABNORMAL**	ABNORMAL	---

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184	>200	**10**	17	---
Iron	ppm	ASTM D5185m	>200	**5**	12	---
Chromium	ppm	ASTM D5185m	>3	**<1**	0	---
Nickel	ppm	ASTM D5185m	>3	**0**	0	---
Titanium	ppm	ASTM D5185m	>10	**<1**	0	---
Silver	ppm	ASTM D5185m		**0**	0	---
Aluminum	ppm	ASTM D5185m	>30	**2**	0	---
Lead	ppm	ASTM D5185m	>15	**0**	0	---
Copper	ppm	ASTM D5185m	>75	**5**	4	---
Tin	ppm	ASTM D5185m	>10	**0**	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**	<1	---
Barium	ppm	ASTM D5185m		**0**	0	---
Molybdenum	ppm	ASTM D5185m		**<1**	<1	---
Manganese	ppm	ASTM D5185m		**0**	0	---
Magnesium	ppm	ASTM D5185m	90	**11**	17	---
Calcium	ppm	ASTM D5185m		**41**	0	---
Phosphorus	ppm	ASTM D5185m		**0**	24	---
Zinc	ppm	ASTM D5185m		**0**	0	---
Sulfur	ppm	ASTM D5185m		**19927**	15444	---

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>+30	**3**	2	---
Sodium	ppm	ASTM D5185m		**0**	0	---
Potassium	ppm	ASTM D5185m	>20	**1**	2	---
Water	%	ASTM D6304	>0.1	**0.008**	0.010	---
ppm Water	ppm	ASTM D6304	>1000	**84**	105.6	---

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**---**	95556	---
Particles >6µm		ASTM D7647	>5000	**---**	▲ 10131	---
Particles >14µm		ASTM D7647	>640	**---**	225	---
Particles >21µm		ASTM D7647	>160	**---**	48	---
Particles >38µm		ASTM D7647	>40	**---**	0	---
Particles >71µm		ASTM D7647	>10	**---**	0	---
Oil Cleanliness		ISO 4406 (c)	>--/19/16	**---**	▲ 24/21/15	---

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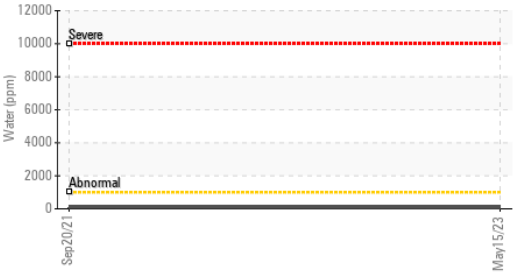
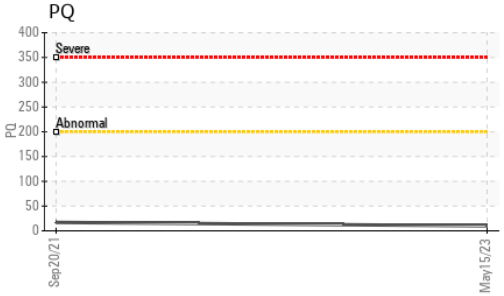
OIL ANALYSIS REPORT

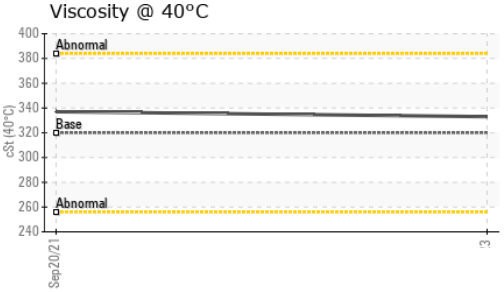
Water (KF)



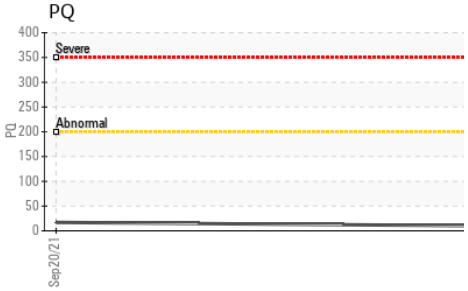
PQ



Viscosity @ 40°C



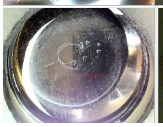
PQ



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	0.25	**0.36**	0.38	---

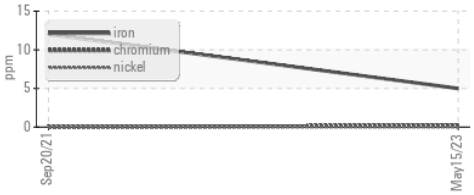
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	LIGHT	---
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	---
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	---
Silt	scalar	*Visual	NONE	▲ **MODER**	NONE	---
Debris	scalar	*Visual	NONE	**NONE**	VLITE	---
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	---
Appearance	scalar	*Visual	NORML	**NORML**	NORML	---
Odor	scalar	*Visual	NORML	**NORML**	NORML	---
Emulsified Water	scalar	*Visual	>0.1	**NEG**	NEG	---
Free Water	scalar	*Visual		**NEG**	NEG	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	320	**333**	337	---

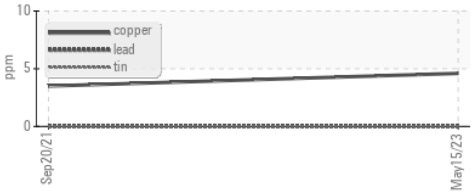
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					*no image*
Bottom					*no image*

GRAPHS

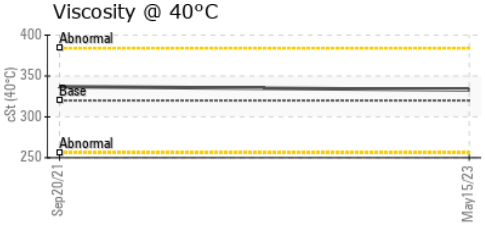
Ferrous Alloys



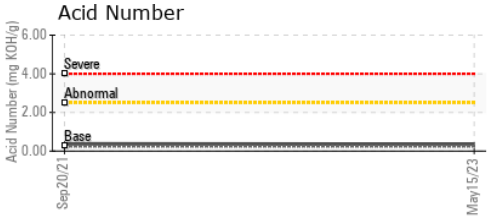
Non-ferrous Metals



Viscosity @ 40°C



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MHI021599 **Received** : 24 Nov 2023
Lab Number : 06016349 **Diagnosed** : 28 Nov 2023
Unique Number : 10755493 **Diagnostician** : Jonathan Hester
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

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)

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