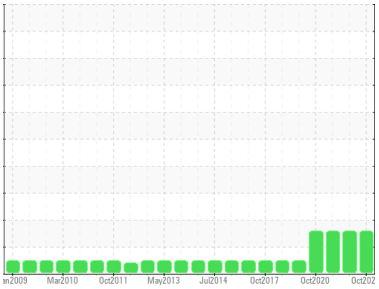
PROBLEM SUMMARY

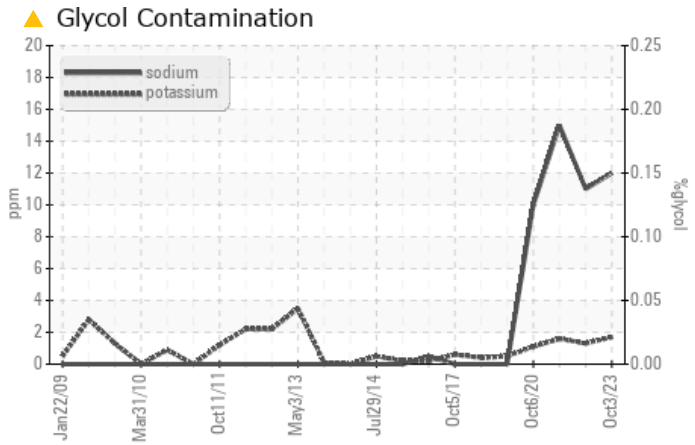
Sample Rating Trend



COOL CHEMICALS

Area
Saugeen Shores SP-17701
Machine Id
04K03
Component
Wind Turbine Gearbox
Fluid
MOBIL MOBILGEAR SHC XMP 320 (260 LTR)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

The oil is near the end of it`s useful service life, recommend schedule an oil change. Resample at the next service interval to monitor. Diagnostician's Note: Does not appear that you have changed this to Amsoil EP Gear oil.

PROBLEMATIC TEST RESULTS

Sample Status				**ABNORMAL**	ABNORMAL	ABNORMAL
Boron	ppm	ASTM D5185(m)	0	▲ **13**	▲ 13	▲ 13
Sodium	ppm	ASTM D5185(m)	>10	▲ **12**	▲ 11	▲ 15

Customer Id: VESTAS
Sample No.: WC0835237
Lab Number: 02590752
Test Package: IND 2

To manage this report scan the QR code

To discuss the diagnosis or test data:
Bill Quesnel CLS,OMA II,MLA-III,LLA-I +1 (289)291-4641 x4641
Bill.Quesnel@wearcheck.com

To change component or sample information:
Gloria Gonzalez +1 (289)291-4643 x4643
gloria.gonzalez@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Service/change Fluid	---	---	?	The oil is near the end of it's useful service life, recommend schedule an oil change.

HISTORICAL DIAGNOSIS

01 Oct 2022 Diag: Bill Quesnel

COOL CHEMICALS

Confirm the source of the lubricant being utilized for top-up/fill. Resample at the next service interval to monitor.All component wear rates are normal. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. Additive levels indicate the addition of a different brand, or type of oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

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07 Oct 2021 Diag: Bill Quesnel

COOL CHEMICALS

The oil is near the end of it`s useful service life, recommend schedule an oil change. Resample at the next service interval to monitor.All component wear rates are normal. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. Sodium ppm levels are abnormally high. Boron ppm levels are abnormally high. The AN level is acceptable for this fluid.

view report

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06 Oct 2020 Diag: Bill Quesnel

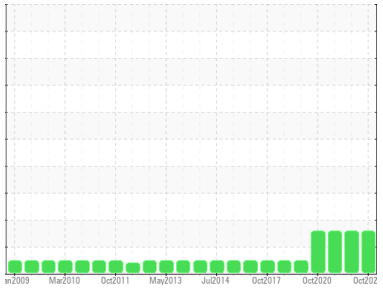
COOL CHEMICALS

Confirm the source of the lubricant being utilized for top-up/fill. Resample at the next service interval to monitor.All component wear rates are normal. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. Additive levels indicate the addition of a different brand, or type of oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



COOL CHEMICALS

Area
Saugeen Shores SP-17701
Machine ID
04K03
Component
Wind Turbine Gearbox
Fluid
MOBIL MOBILGEAR SHC XMP 320 (260 LTR)

DIAGNOSIS

Recommendation

The oil is near the end of it`s useful service life, recommend schedule an oil change. Resample at the next service interval to monitor. Diagnostician's Note: Does not appear that you have changed this to Amsoil EP Gear oil.

Wear

All component wear rates are normal.

Contamination

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

Fluid Condition

Sodium ppm levels are abnormally high. Boron ppm levels are abnormally high. The AN level is acceptable for this fluid.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0835237**	WC0577992	WC0546330
Sample Date		Client Info		**03 Oct 2023**	01 Oct 2022	07 Oct 2021
Machine Age	yrs	Client Info		**4**	14	13
Oil Age	yrs	Client Info		**4**	14	13
Oil Changed		Client Info		**Filtered**	Not Changd	Not Changd
Sample Status				**ABNORMAL**	ABNORMAL	ABNORMAL

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*	>50	**0**	0	0
Iron	ppm	ASTM D5185(m)	>75	**18**	16	17
Chromium	ppm	ASTM D5185(m)	>5	**0**	0	<1
Nickel	ppm	ASTM D5185(m)	>10	**<1**	<1	<1
Titanium	ppm	ASTM D5185(m)	>10	**0**	<1	0
Silver	ppm	ASTM D5185(m)		**<1**	0	0
Aluminum	ppm	ASTM D5185(m)	>10	**0**	<1	<1
Lead	ppm	ASTM D5185(m)	>15	**2**	2	3
Copper	ppm	ASTM D5185(m)	>5	**<1**	<1	1
Tin	ppm	ASTM D5185(m)	>10	**0**	0	0
Antimony	ppm	ASTM D5185(m)	>5	**0**	0	<1
Vanadium	ppm	ASTM D5185(m)		**0**	0	0
Beryllium	ppm	ASTM D5185(m)		**0**	0	0
Cadmium	ppm	ASTM D5185(m)		**0**	0	0

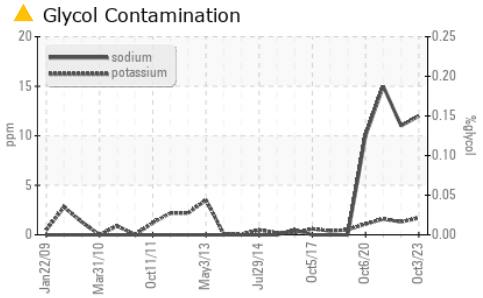
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	0	▲ **13**	▲ 13	▲ 13
Barium	ppm	ASTM D5185(m)		**<1**	0	0
Molybdenum	ppm	ASTM D5185(m)	0	**0**	0	0
Manganese	ppm	ASTM D5185(m)		**0**	<1	<1
Magnesium	ppm	ASTM D5185(m)		**<1**	<1	<1
Calcium	ppm	ASTM D5185(m)	0	**2**	<1	3
Phosphorus	ppm	ASTM D5185(m)	485	**347**	397	420
Zinc	ppm	ASTM D5185(m)	0	**23**	20	23
Sulfur	ppm	ASTM D5185(m)		**4468**	4585	4665
Lithium	ppm	ASTM D5185(m)		**<1**	<1	<1

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>40	**13**	14	17
Sodium	ppm	ASTM D5185(m)	>10	▲ **12**	▲ 11	▲ 15
Potassium	ppm	ASTM D5185(m)	>20	**2**	1	2
Water	%	ASTM D6304*	>0.02	**0.004**	0.008	0.008
ppm Water	ppm	ASTM D6304*	>200	**43.8**	80.9	86.5

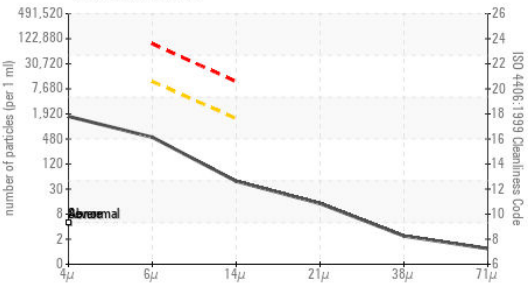
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	ASTM D7844*		**0**	0	0
Nitration	Abs/cm	ASTM D7624*		**1.8**	2.2	1.8
Sulfation	Abs/.1mm	ASTM D7415*		**45.3**	24.8	45.1

OIL ANALYSIS REPORT

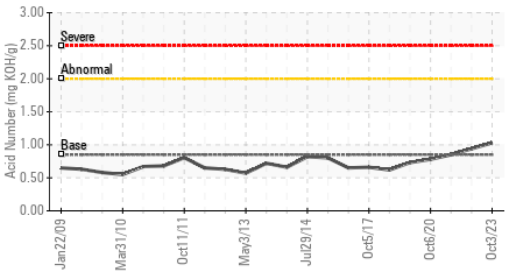
Glycol Contamination



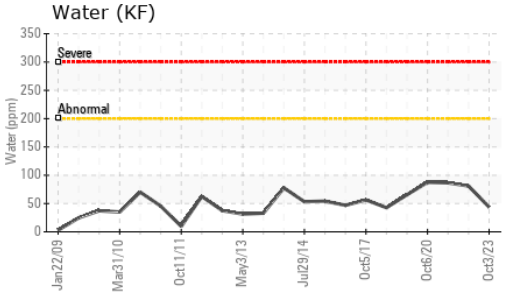
Particle Count



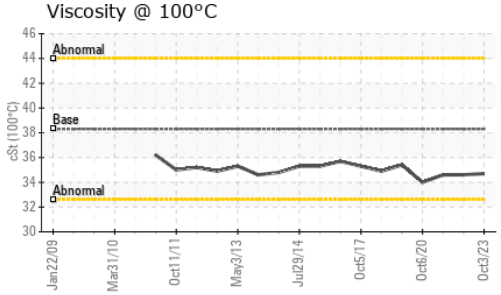
Acid Number



Water (KF)



Viscosity @ 100°C

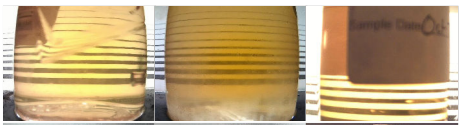


FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**1467**	946	1833
Particles >6µm		ASTM D7647	>10000	**464**	223	410
Particles >14µm		ASTM D7647	>1300	**41**	21	40
Particles >21µm		ASTM D7647	>320	**12**	10	12
Particles >38µm		ASTM D7647	>80	**2**	4	0
Particles >71µm		ASTM D7647	>20	**1**	3	0
Oil Cleanliness		ISO 4406 (c)	>--/20/17	**18/16/13**	17/15/12	18/16/12

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	ASTM D7414*		**54.3**	20.7	52.3
Acid Number (AN)	mg KOH/g	ASTM D974*	0.85	**1.03**	0.94	0.85

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	NONE
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*	>0.02	**NEG**	NEG	NEG
Free Water	scalar	Visual*		**NEG**	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	335	**317**	319	314
Visc @ 100°C	cSt	ASTM D7279(m)	38.3	**34.7**	34.6	34.6
Viscosity Index (VI)	Scale	ASTM D2270*	164	**154**	153	155

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 **Vestas American Wind Technology Inc.**
Sample No. : WC0835237 **Received** : 20 Oct 2023 1417 NW Everett Street
Lab Number : 02590752 **Diagnosed** : 23 Oct 2023 Portland, OR
Unique Number : 5659818 **Diagnostician** : Bill Quesnel US 97209
Test Package : IND 2 (Additional Tests: FT-IR, KF, KV100, PQ, TAN Man, VI) Contact: Nicole Philippi

To discuss this sample report, contact Customer Service at 1-800-268-2131. NiPhi@vestas.com
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab. T: (503)327-7683
Validity of results and interpretation are based on the sample and information as supplied. F: (503)327-0247