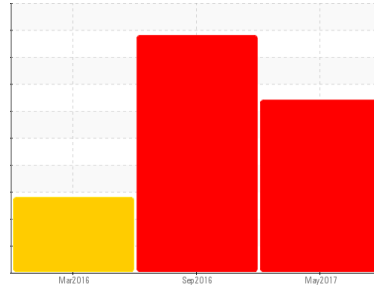




PROBLEM SUMMARY

Sample Rank Trend



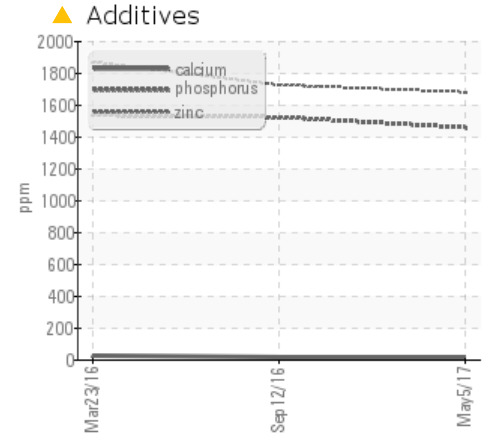
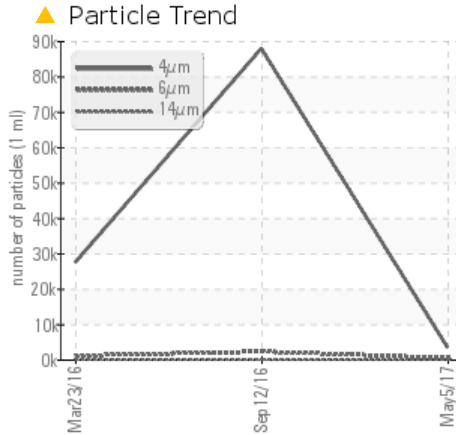
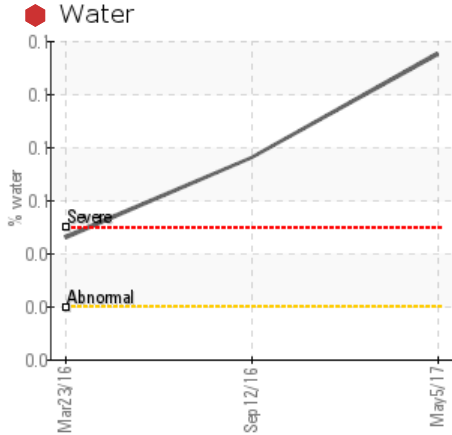
WATER



Machine Id
WEC013-82710

Component
EICKHOFF JFRA-560SR-06A Wind Turbine Gearbox
Fluid
MOBILGEAR SHC 320 (475 LTR)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We advise that you use off-line filtration with water adsorbent filters to attempt to remove the water from this oil. We recommend you service the filters on this component. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition. The fluid was specified as MOBIL MOBILGEAR SHC 320, however, a fluid match indicates that this fluid is ISO 320 Gear Oil (WTGB). Please confirm the oil type and grade on your next sample.

PROBLEMATIC TEST RESULTS

Sample Status				SEVERE	SEVERE	ABNORMAL
Molybdenum	ppm	ASTM D5185		▲ 1264	▲ 1290	▲ 1321
Magnesium	ppm	ASTM D5185		▲ 1880	▲ 1913	▲ 2081
Calcium	ppm	ASTM D5185		▲ 18	▲ 19	▲ 20
Phosphorus	ppm	ASTM D5185		▲ 1458	▲ 1523	▲ 1535
Zinc	ppm	ASTM D5185		▲ 1680	▲ 1725	▲ 1870
Sulfur	ppm	ASTM D5185		▲ 5269	▲ 5397	▲ 5918
Water	%	ASTM D6304	>0.02	● 0.115	● 0.076	● 0.046
ppm Water	ppm	ASTM D6304	>200	● 1151.4	● 760.9	● 460.9
Particles >6µm		ASTM D7647	>320	▲ 476	▲ 2272	▲ 1116
Oil Cleanliness		ISO 4406 (c)	>--/15/12	▲ 19/16/12	▲ 24/18/12	▲ 22/17/10

Customer Id: CUSANY
Sample No.: WC1234567
Lab Number: 01234567
Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
Kevin Marson +1 (905)569-8600 x4644
Kevin.Marson@wearcheck.com

To change component or sample information:
Gloria Gonzalez +1 (905)569-8600 x4643
gloria.gonzalez@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Filter	MISSED	Sep 14 2017	?	We recommend you service the filters on this component.
Resample	MISSED	Sep 14 2017	?	We recommend an early resample to monitor this condition.
Alert	MISSED	Sep 14 2017	?	The fluid was specified as MOBIL MOBILGEAR SHC 320, however, a fluid match indicates that this fluid is ISO 320 Gear Oil (WTGB). Please confirm the oil type and grade on your next sample.
Check Breathers	MISSED	Sep 14 2017	?	The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather.
Check Dirt Access	MISSED	Sep 14 2017	?	We advise that you check all areas where dirt can enter the system.
Check Fluid Source	MISSED	Sep 14 2017	?	Confirm the source of the lubricant being utilized for top-up/fill.
Check Seals	MISSED	Sep 14 2017	?	Check seals and/or filters for points of contaminant entry.
Filter Fluid	MISSED	Sep 14 2017	?	We advise that you use off-line filtration with water adsorbent filters to attempt to remove the water from this oil.

HISTORICAL DIAGNOSIS

WATER



12 Sep 2016 Diag: Wes Davis

Check seals and/or filters for points of contaminant entry. We advise that you check all areas where dirt can enter the system. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We advise that you use off-line filtration with water adsorbent filters to attempt to remove the water from this oil. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition. The fluid was specified as MOBIL MOBILGEAR SHC 320, however, a fluid match indicates that this fluid is ISO 320 Gear Oil (WTGB). Please confirm the oil type and grade on your next sample. Aluminum ppm levels are noted. All other component wear rates are normal. Water and ppm water contamination levels are severe. Silicon ppm levels are abnormally high. Particles >6µm are abnormally high. Oil Cleanliness is abnormal. There is a high concentration of water present in the oil. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. Additive levels indicate the addition of a different brand, or type of oil. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

[view report](#)



WATER



23 Mar 2016 Diag: Kevin Marson

We recommend you service the filters on this component. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition. The fluid was specified as MOBIL MOBILGEAR SHC 320, however, a fluid match indicates that this fluid is ISO 320 Gear Oil (WTGB). Please confirm the oil type and grade on your next sample. All component wear rates are normal. Particles >6µm are abnormally high. The water content is negligible. 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.

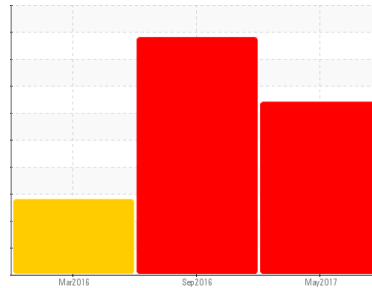
[view report](#)





OIL ANALYSIS REPORT

Sample Rank Trend



WATER



Machine Id
WEC013-82710

Component
EICKHOFF JFRA-560SR-06A Wind Turbine Gearbox

Fluid
MOBILGEAR SHC 320 (475 LTR)

DIAGNOSIS

Recommendation

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We advise that you use off-line filtration with water adsorbent filters to attempt to remove the water from this oil. We recommend you service the filters on this component. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition. The fluid was specified as MOBIL MOBILGEAR SHC 320, however, a fluid match indicates that this fluid is ISO 320 Gear Oil (WTGB). Please confirm the oil type and grade on your next sample.

Wear

All component wear rates are normal.

Contamination

There is a light amount of silt (particulates < 14 microns in size) present in the oil. There is a high concentration of water present in the oil.

Fluid Condition

Additive levels indicate the addition of a different brand, or type of oil. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

SAMPLE INFORMATION

	method	limit/base	current	history 1	history 2
Sample Number			WC964444	WC964374	WC940978
Sample Date			05 May 2017	12 Sep 2016	23 Mar 2016
Machine Age	hrs		14152	1	4509
Oil Age	hrs		14152	1	4509
Oil Changed			Not Changed	Not Changed	Not Changed
Sample Status			SEVERE	SEVERE	ABNORMAL

WEAR METALS

	method	limit/base	current	history 1	history 2
PQ	In-house	>50	44	15	7
Iron	ppm	ASTM D5185 >30	23	28	22
Chromium	ppm	ASTM D5185 >3	0.1	0.2	0.2
Manganese	ppm	ASTM D5185	0.6	0.6	0.6
Nickel	ppm	ASTM D5185 >3	0.0	0.0	0.0
Titanium	ppm	ASTM D5185 >10	0.0	0.0	0.0
Silver	ppm	ASTM D5185	0.0	0.0	0.0
Aluminum	ppm	ASTM D5185 >30	4.7	▲ 9.9	11
Lead	ppm	ASTM D5185 >15	0.0	0.0	0.0
Copper	ppm	ASTM D5185 >10	1.6	1.8	1.7
Tin	ppm	ASTM D5185	0.0	0.0	0.0
Antimony	ppm	ASTM D5185	1.3	1.0	1.1
Vanadium	ppm	ASTM D5185	0.1	0.2	0.1
Beryllium	ppm	ASTM D5185	0.0	0.0	0.0
Cadmium	ppm	ASTM D5185	0.1	0.0	0.1

ADDITIVES

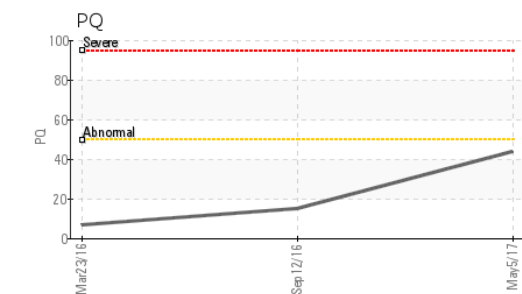
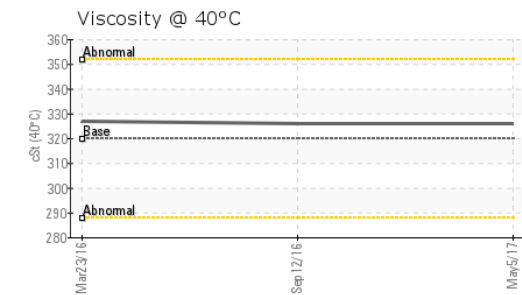
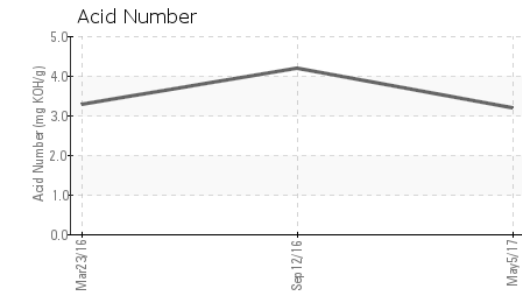
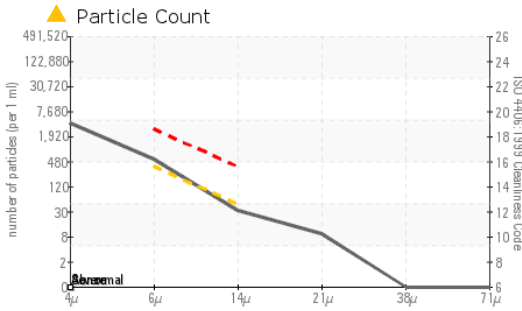
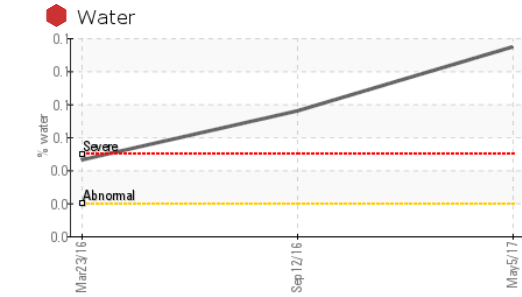
	method	limit/base	current	history 1	history 2
Boron	ppm	ASTM D5185	0.8	0.5	0.7
Barium	ppm	ASTM D5185	2.5	2.5	2.6
Molybdenum	ppm	ASTM D5185	▲ 1264	▲ 1290	▲ 1321
Magnesium	ppm	ASTM D5185	▲ 1880	▲ 1913	▲ 2081
Calcium	ppm	ASTM D5185	▲ 18	▲ 19	▲ 20
Phosphorus	ppm	ASTM D5185	▲ 1458	▲ 1523	▲ 1535
Zinc	ppm	ASTM D5185	▲ 1680	▲ 1725	▲ 1870
Sulfur	ppm	ASTM D5185	▲ 5269	▲ 5397	▲ 5918
Lithium	ppm	ASTM D5185	0.2	0.2	0.2

CONTAMINANTS

	method	limit/base	current	history 1	history 2
Silicon	ppm	ASTM D5185 >15	19	▲ 19	17
Sodium	ppm	ASTM D5185	4.1	4.3	2.0
Potassium	ppm	ASTM D5185 >20	0.9	0.1	1.3
Water	%	ASTM D6304 >0.02	● 0.115	● 0.076	0.046
ppm Water	ppm	ASTM D6304 >200	● 1151.4	● 760.9	460.9

FLUID CLEANLINESS

	method	limit/base	current	history 1	history 2
Particles >4µm	ASTM D7647		3484	87904	27338
Particles >6µm	ASTM D7647	>320	▲ 476	▲ 2272	▲ 1116
Particles >14µm	ASTM D7647	>40	28	31	7
Particles >21µm	ASTM D7647	>10	8	8	2
Particles >38µm	ASTM D7647	>3	0	0	0
Particles >71µm	ASTM D7647	>3	0	0	0
Oil Cleanliness	ISO 4406 (c)	>--/15/12	▲ 19/16/12	▲ 24/18/12	▲ 22/17/10



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC1234567 **Received** : 18 May 2017
Lab Number : 01234567 **Diagnosed** : 24 May 2017
Unique Number : 12345678 **Diagnostician** : Kevin Marson
Test Package : IND 2 (Additional Tests: KF, PQ)

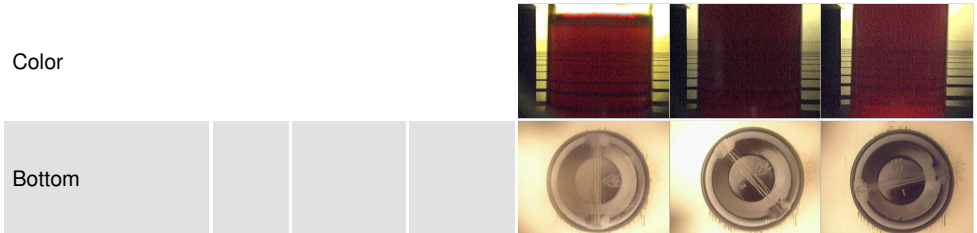
To discuss diagnosis or test data, contact Technical Support at 1-800-268-2131.
 To change component or sample information, contact Customer Service at 1-800-268-2131.

FLUID DEGRADATION		method	limit/base	current	history 1	history 2
Acid Number (AN)	mg KOH/g	ASTM D664		3.20	4.19	3.27

VISUAL		method	limit/base	current	history 1	history 2
White Metal	scalar	Visual	NONE	NONE	NONE	NONE
Babbitt	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	history 1	history 2
Visc @ 40°C	cSt	ASTM D7279	320	326	326	327

SAMPLE IMAGES		method	limit/base	current	history 1	history 2
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