



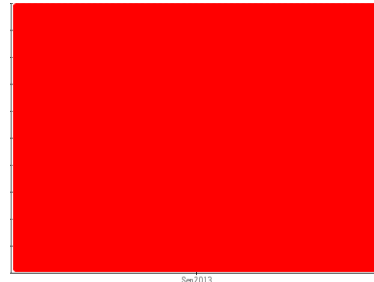
PROBLEM SUMMARY

Sample Rank Trend

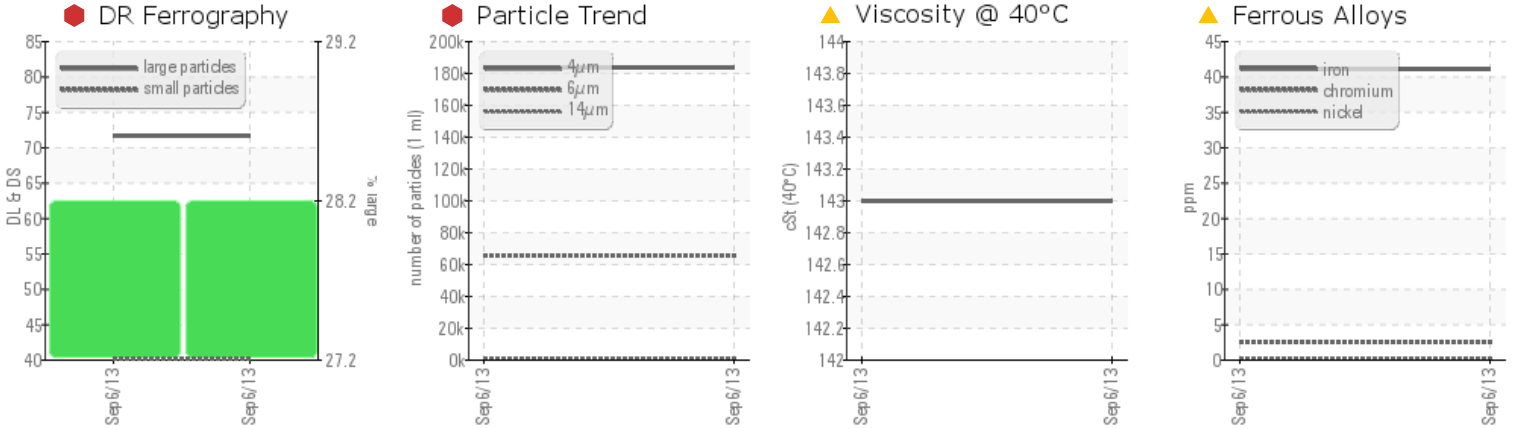
WEAR PARTICLES



Machine Id
R92546
 Component
BOMFIGLIOLI 711T4WNXREX5020A1139P112TL Wind Turbine Gearbox
 Fluid
MOBILGEAR SHC XMP 320 (18 LTR)



COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. 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. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation. The fluid was specified as MOBIL MOBILGEAR SHC XMP 320, however, a fluid match indicates that this fluid is ISO 150 Synthetic (PAO) Gear Oil. Please confirm the oil type and grade on your next sample.

PROBLEMATIC TEST RESULTS

Sample Status	SEVERE	---	---
Chromium ppm ASTM D5185	▲ 2.4	---	---
Large Particles DR-Ferr	● 71.7	---	---
Small Particles DR-Ferr	● 40.2	---	---
Total Particles DR-Ferr	● 111.9	---	---
Severity Index DR-Ferr	● 225855	---	---
Ferrous Sliding Scale 0-10 ASTM D7684	▲ 2	---	---
Ferrous Rolling Scale 0-10 ASTM D7684	▲ 2	---	---
Sand/Dirt Scale 0-10 ASTM D7684	▲ 4	---	---
Boron ppm ASTM D5185	▲ 27	---	---
Particles >4µm ASTM D7647	● 183780	---	---
Particles >6µm ASTM D7647	● 64900	---	---
Particles >14µm ASTM D7647	● 913	---	---
Particles >21µm ASTM D7647	▲ 88	---	---
Oil Cleanliness ISO 4406 (c)	● 25/23/17	---	---
Visc @ 40°C cSt ASTM D7279	▲ 143	---	---

Customer Id: CUSANY
 Sample No.: WC1234567
 Lab Number: 01234567
 Test Package: IND 3



To manage this report scan the QR code

To discuss the diagnosis or test data:
 Bill Quesnel +1 (905)569-8600 x4641
Bill.Quesnel@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	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.
Resample	---	---	?	Resample in 30-45 days to monitor this situation.
Alert	---	---	?	The fluid was specified as MOBIL MOBILGEAR SHC XMP 320, however, a fluid match indicates that this fluid is ISO 150 Synthetic (PAO) Gear Oil. Please confirm the oil type and grade on your next sample.
Check Breathers	---	---	?	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	---	---	?	We advise that you check all areas where contaminants can enter the system.
Check Fluid Source	---	---	?	Confirm the source of the lubricant being utilized for top-up/fill.
Filter Fluid	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.

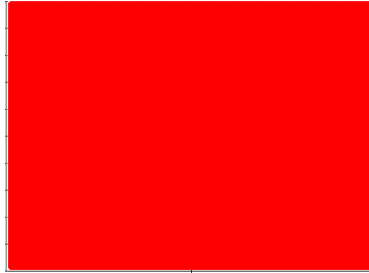
HISTORICAL DIAGNOSIS



OIL ANALYSIS REPORT

Sample Rank Trend

WEAR PARTICLES



Machine Id
R92546

Component
BOMFIGLIOLI 711T4WNXREX5020A1139P112TL Wind Turbine Gearbox

Fluid
MOBILGEAR SHC XMP 320 (18 LTR)

DIAGNOSIS

Recommendation

We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. 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. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation. The fluid was specified as MOBIL MOBILGEAR SHC XMP 320, however, a fluid match indicates that this fluid is ISO 150 Synthetic (PAO) Gear Oil. Please confirm the oil type and grade on your next sample.

Wear

Large Particles and small particles and severity index and total particles levels are severe. Wear particle analysis indicates that the ferrous rolling, ferrous sliding particles are abnormal. Chromium ppm levels are abnormal.

Grease Condition

Viscosity of sample indicates oil is within ISO 150 range, advise investigate. This plus the additive levels indicates that this is not the same brand, or type of oil as reported. The AN level is acceptable for this fluid.

Contaminants

Particles >14µm are severely high. Particles >6µm are severely high. Particles >4µm are severely high. Wear particle analysis indicates that the sand/dirt particles are abnormal. Particles >21µm are abnormally high. The water content is negligible. The system cleanliness code is much higher than the acceptable limit for the target ISO 4406 cleanliness code.

SAMPLE INFORMATION

	method	limit/base	current	history 1	history 2
Sample Number			WC830418	---	---
Sample Date			06 Sep 2013	---	---
Machine Age	hrs		5355	---	---
Oil Age	hrs		5355	---	---
Oil Changed			Not Chngd	---	---
Sample Status			SEVERE	---	---

WEAR METALS

	method	limit/base	current	history 1	history 2
PQ	In-house		25	---	---
Iron	ppm ASTM D5185		41	---	---
Chromium	ppm ASTM D5185		▲ 2.4	---	---
Manganese	ppm ASTM D5185		1.6	---	---
Nickel	ppm ASTM D5185		0.2	---	---
Titanium	ppm ASTM D5185		0.0	---	---
Silver	ppm ASTM D5185		0.0	---	---
Aluminum	ppm ASTM D5185		0.0	---	---
Lead	ppm ASTM D5185		0.0	---	---
Copper	ppm ASTM D5185		0.4	---	---
Tin	ppm ASTM D5185		0.0	---	---
Antimony	ppm ASTM D5185		0.0	---	---
Vanadium	ppm ASTM D5185		0.0	---	---
Beryllium	ppm ASTM D5185		0.0	---	---
Cadmium	ppm ASTM D5185		0.0	---	---

ADDITIVES

	method	limit/base	current	history 1	history 2
Boron	ppm ASTM D5185		▲ 27	---	---
Barium	ppm ASTM D5185		2.3	---	---
Molybdenum	ppm ASTM D5185		1.9	---	---
Magnesium	ppm ASTM D5185		5.9	---	---
Calcium	ppm ASTM D5185		3.6	---	---
Phosphorus	ppm ASTM D5185		466	---	---
Zinc	ppm ASTM D5185		13	---	---
Sulfur	ppm ASTM D5185		6744	---	---
Lithium	ppm ASTM D5185		0.2	---	---

CONTAMINANTS

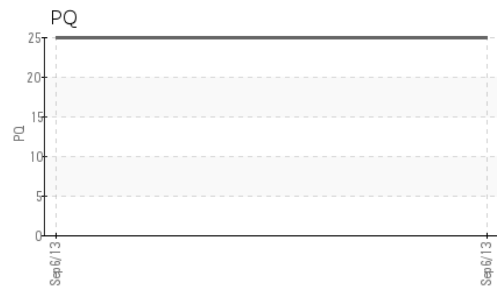
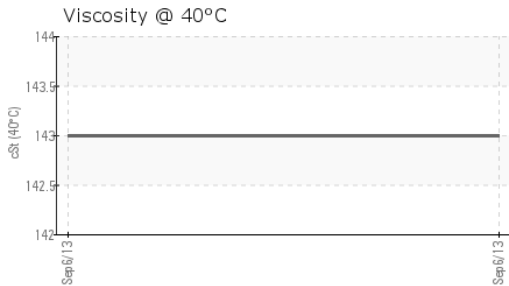
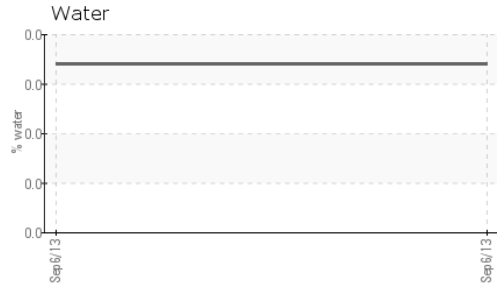
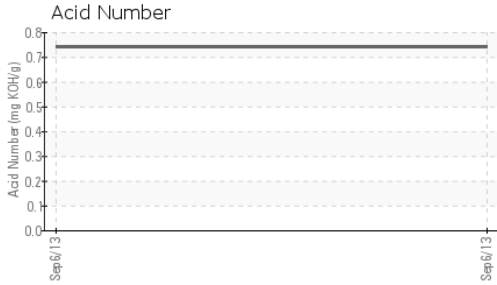
	method	limit/base	current	history 1	history 2
Silicon	ppm ASTM D5185		4.9	---	---
Sodium	ppm ASTM D5185		1.6	---	---
Potassium	ppm ASTM D5185		1.0	---	---
Water	% ASTM D6304		0.017	---	---
ppm Water	ppm ASTM D6304		173.6	---	---

INFRA-RED

	method	limit/base	current	history 1	history 2
Soot %	% ASTM D7686		0	---	---
Nitration (PA)	% ASTM D7624	>100	31	---	---
Sulfation (PA)	% ASTM D7415	>100	310	---	---



OIL ANALYSIS REPORT



FLUID CLEANLINESS		method	limit/base	current	history 1	history 2
Particles >4µm		ASTM D7647		183780	---	---
Particles >6µm		ASTM D7647		64900	---	---
Particles >14µm		ASTM D7647		913	---	---
Particles >21µm		ASTM D7647		88	---	---
Particles >38µm		ASTM D7647		0	---	---
Particles >71µm		ASTM D7647		0	---	---
Oil Cleanliness		ISO 4406 (c)		25/23/17	---	---

FLUID DEGRADATION		method	limit/base	current	history 1	history 2
Oxidation (PA)	%	ASTM D7414	>100	418	---	---
Acid Number (AN)	mg KOH/g	ASTM D664		0.74	---	---

VISUAL		method	limit/base	current	history 1	history 2
White Metal	scalar	Visual	NONE	VLITE	---	---
Babbitt	scalar	Visual	NONE	NONE	---	---
Precipitate	scalar	Visual	NONE	NONE	---	---
Silt	scalar	Visual	NONE	VLITE	---	---
Debris	scalar	Visual	NONE	VLITE	---	---
Sand/Dirt	scalar	Visual	NONE	NONE	---	---
Appearance	scalar	Visual	NORML	NORML	---	---
Odor	scalar	Visual	NORML	NORML	---	---
Emulsified Water	scalar	Visual		NEG	---	---
Free Water	scalar	Visual		NEG	---	---

FLUID PROPERTIES		method	limit/base	current	history 1	history 2
Visc @ 40°C	cSt	ASTM D7279		143	---	---
Fluid Type		In-house		ISO_GEAR_PAO	---	---

SAMPLE IMAGES		method	limit/base	current	history 1	history 2
Color					no image	no image
Bottom					no image	no image

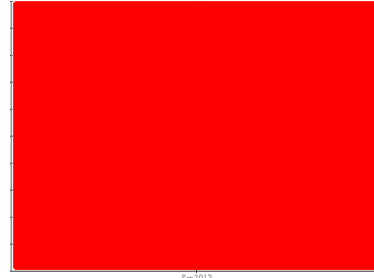


Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC1234567 **Received** : 03 Oct 2013
Lab Number : 01234567 **Diagnosed** : 08 Oct 2013
Unique Number : 12345678 **Diagnostician** : Bill Quesnel
Test Package : IND 3 (Additional Tests: FluidDetermination, FT-IR, KF, PrtCount)

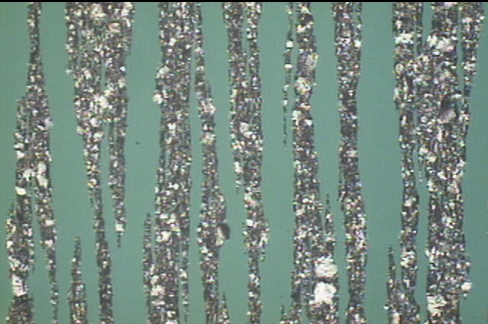
Cusany Logistics Inc.
 1212 Industrial Place
 Centerville, OH
 USA 75900
 Contact: Jim Leduc
 jim.leduc@cusanylogisticsinc.com
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To discuss diagnosis or test data, contact Technical Support at 1-800-268-2131.
 To change component or sample information, contact Customer Service at 1-800-268-2131.

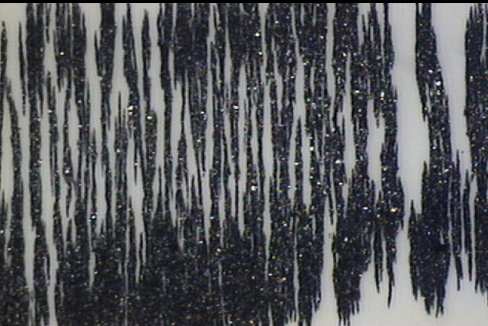
Machine Id
R92546
 Component
BOMFIGLIOLI 711T4WNXREX5020A1139P112TL Wind Turbine Gearbox
 Fluid
MOBILGEAR SHC XMP 320 (18 LTR)



Magn: 200x Illum: BC



Magn: 50x Illum: RW



Magn: 100x Illum: RW

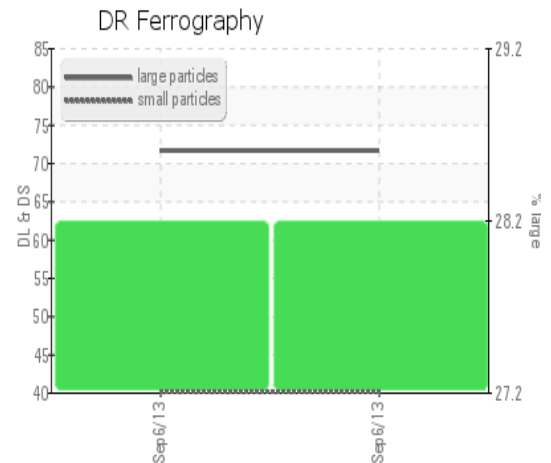


DR-FERROGRAPHY		method	limit/base	current	history 1	history 2
Large Particles		DR-Ferr		71.7	---	---
Small Particles		DR-Ferr		40.2	---	---
Total Particles		DR-Ferr		111.9	---	---
Large Particles Percentage	%	DR-Ferr		28.2	---	---
Severity Index		DR-Ferr		225855	---	---

FERROGRAPHY		method	limit/base	current	history 1	history 2
Ferrous Rubbing	Scale 0-10	ASTM D7684		3		
Ferrous Sliding	Scale 0-10	ASTM D7684		2		
Ferrous Cutting	Scale 0-10	ASTM D7684				
Ferrous Rolling	Scale 0-10	ASTM D7684		2		
Ferrous Break-in	Scale 0-10	ASTM D7684				
Ferrous Spheres	Scale 0-10	ASTM D7684				
Ferrous Black Oxides	Scale 0-10	ASTM D7684				
Ferrous Red Oxides	Scale 0-10	ASTM D7684				
Ferrous Corrosive	Scale 0-10	ASTM D7684		3		
Ferrous Other	Scale 0-10	ASTM D7684				
Nonferrous Rubbing	Scale 0-10	ASTM D7684				
Nonferrous Sliding	Scale 0-10	ASTM D7684				
Nonferrous Cutting	Scale 0-10	ASTM D7684				
Nonferrous Rolling	Scale 0-10	ASTM D7684				
Nonferrous Other	Scale 0-10	ASTM D7684				
Carbonaceous Material	Scale 0-10	ASTM D7684				
Lubricant Degradation	Scale 0-10	ASTM D7684		3		
Sand/Dirt	Scale 0-10	ASTM D7684		4		
Fibres	Scale 0-10	ASTM D7684				
Spheres	Scale 0-10	ASTM D7684				
Other	Scale 0-10	ASTM D7684				

WEAR

Large Particles and small particles and severity index and total particles levels are severe. Wear particle analysis indicates that the ferrous rolling, ferrous sliding particles are abnormal. Chromium ppm levels are abnormal.



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