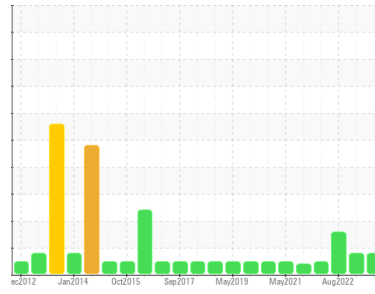




OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area

BEEBE [2000060080]

Machine Id

09WEA82313

Component

Wind Turbine Gearbox

Fluid

CASTROL OPTIGEAR SYNTHETIC X 320 (4 LTR)

DIAGNOSIS

Recommendation

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.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		NX06146580	NX05798674	NX05621785
Sample Date	Client Info		05 Apr 2024	14 Feb 2023	18 Aug 2022
Machine Age	hrs	Client Info	96876	71892	68497
Oil Age	hrs	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			ATTENTION	ABNORMAL	ABNORMAL

WEAR METALS

	method	limit/base	current	history1	history2	
PQ	ASTM D8184	>80	17	60	19	
Iron	ppm	ASTM D5185m	>150	19	▲ 195	▲ 175
Chromium	ppm	ASTM D5185m	>5	<1	1	1
Nickel	ppm	ASTM D5185m	>10	<1	<1	2
Titanium	ppm	ASTM D5185m	>10	<1	0	0
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>10	7	<1	<1
Lead	ppm	ASTM D5185m	>20	<1	0	0
Copper	ppm	ASTM D5185m	>50	1	1	1
Tin	ppm	ASTM D5185m	>10	<1	0	0
Antimony	ppm	ASTM D5185m	>5	---	---	---
Vanadium	ppm	ASTM D5185m		<1	0	<1
Cadmium	ppm	ASTM D5185m		1	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		0	0
Barium	ppm	ASTM D5185m		4	2
Molybdenum	ppm	ASTM D5185m	1150	923	813
Manganese	ppm	ASTM D5185m		1	2
Magnesium	ppm	ASTM D5185m		7	15
Calcium	ppm	ASTM D5185m	2000	1763	1634
Phosphorus	ppm	ASTM D5185m	400	354	314
Zinc	ppm	ASTM D5185m	0	<1	5
Sulfur	ppm	ASTM D5185m	1850	2005	1685

CONTAMINANTS

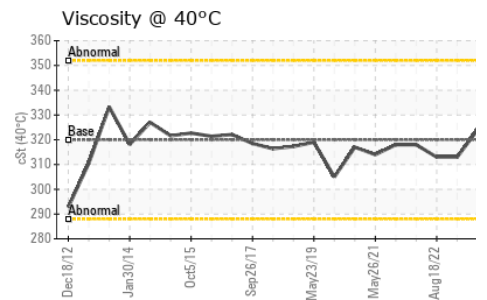
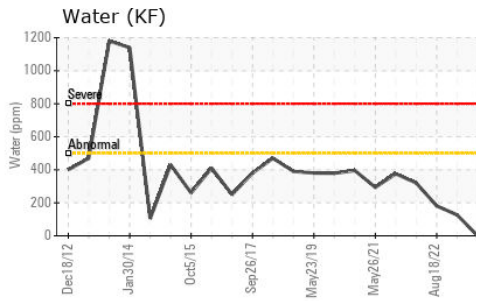
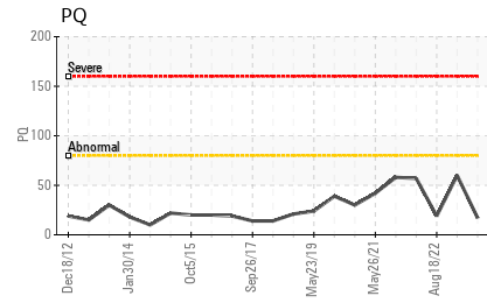
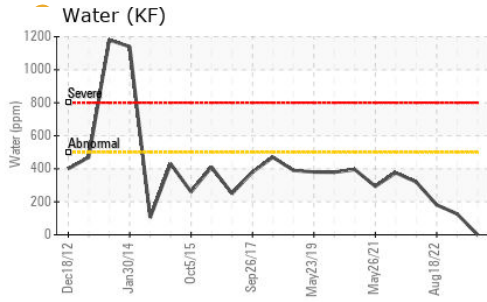
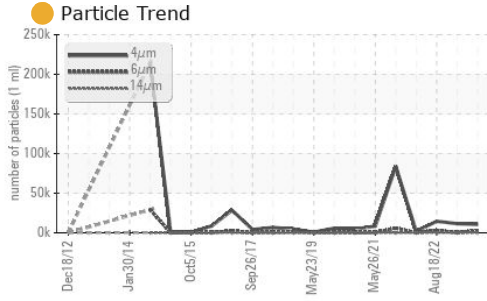
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	14	13
Sodium	ppm	ASTM D5185m	>20	0	0
Potassium	ppm	ASTM D5185m	>20	1	<1
Water	%	ASTM D6304	>0.05	0.00	0.012
ppm Water	ppm	ASTM D6304	>500	0	126.3

FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		10743	11552	14554
Particles >6µm	ASTM D7647	>2500	2616	301	2982
Particles >14µm	ASTM D7647	>320	158	9	152
Particles >21µm	ASTM D7647	>80	31	1	30
Particles >38µm	ASTM D7647	>20	1	0	0
Particles >71µm	ASTM D7647	>4	1	0	0
Oil Cleanliness	ISO 4406 (c)	>--/18/15	21/19/14	21/15/10	21/19/14



OIL ANALYSIS REPORT

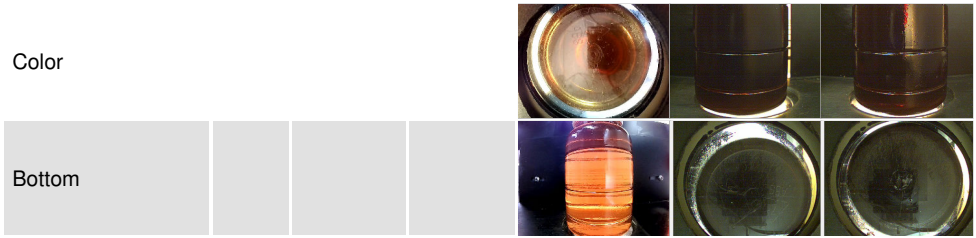


FLUID DEGRADATION	method	limit/base	current	history1	history2	
Acid Number (AN)	mg KOH/g	ASTM D8045	1.6	1.04	0.23	0.38

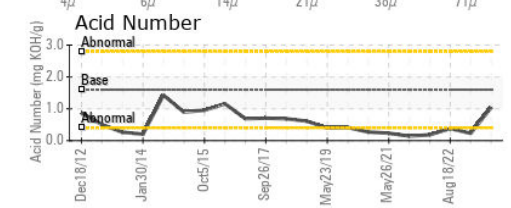
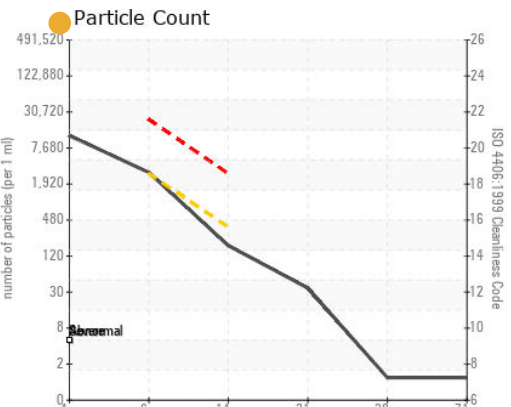
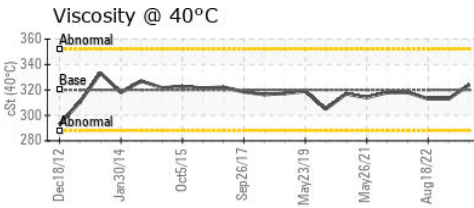
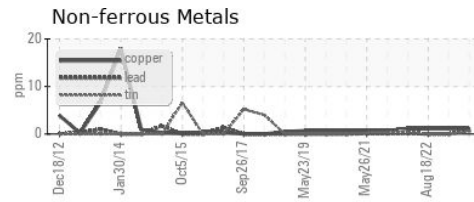
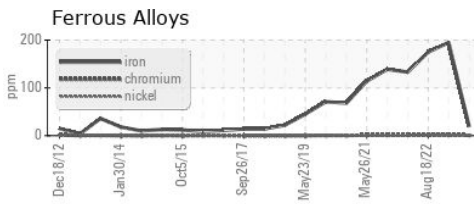
VISUAL	method	limit/base	current	history1	history2	
White Metal	scalar	*Visual	NONE	NONE	NONE	LIGHT
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	LIGHT	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.05	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2	
Visc @ 40°C	cSt	ASTM D445	320	324	313	313

SAMPLE IMAGES	method	limit/base	current	history1	history2
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GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : NX06146580
Lab Number : 06146580
Unique Number : 10976658
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

NORDEX USA - BEEBE
 1200 S COUNTY FARM RD
 ITHACA, MI
 US 48847

Contact: TUCKER WITT
 tucker.witt@constellation.com

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)

T: (312)386-7102