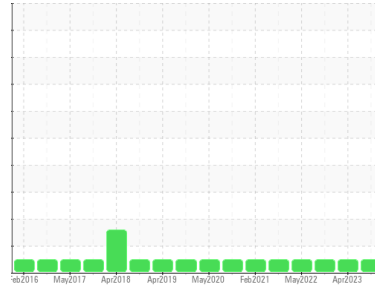




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area
THUNDER SPIRIT [200005313]
 Machine Id
34WEA84024 (S/N EWP01551)

Component
Wind Turbine Gearbox
 Fluid
CASTROL OPTIGEAR SYNTHETIC X 320 (--- QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the component. The amount and size of particulates present in the system is acceptable.

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		NX014770	NX011710	NX011138
Sample Date	Client Info		20 Nov 2023	28 Apr 2023	05 Oct 2022
Machine Age	hrs	Client Info	58620	54852	50613
Oil Age	hrs	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			NORMAL	NORMAL	NORMAL

WEAR METALS

	method	limit/base	current	history1	history2
PQ	ASTM D8184	>80	13	12	7
Iron	ppm	ASTM D5185m	>150	3	2
Chromium	ppm	ASTM D5185m	>5	<1	<1
Nickel	ppm	ASTM D5185m	>10	0	0
Titanium	ppm	ASTM D5185m	>10	<1	0
Silver	ppm	ASTM D5185m		0	0
Aluminum	ppm	ASTM D5185m	>10	8	0
Lead	ppm	ASTM D5185m	>20	0	0
Copper	ppm	ASTM D5185m	>50	2	1
Tin	ppm	ASTM D5185m	>10	0	0
Vanadium	ppm	ASTM D5185m		<1	<1
Cadmium	ppm	ASTM D5185m		0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		0	17
Barium	ppm	ASTM D5185m		8	0
Molybdenum	ppm	ASTM D5185m	1150	876	780
Manganese	ppm	ASTM D5185m		0	0
Magnesium	ppm	ASTM D5185m		6	7
Calcium	ppm	ASTM D5185m	2000	1533	1454
Phosphorus	ppm	ASTM D5185m	400	408	361
Zinc	ppm	ASTM D5185m	0	0	0
Sulfur	ppm	ASTM D5185m	1850	2193	2227

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	14	11
Sodium	ppm	ASTM D5185m	>20	7	6
Potassium	ppm	ASTM D5185m	>20	3	<1
Water	%	ASTM D6304	>0.05	0.017	0.005
ppm Water	ppm	ASTM D6304	>500	173	51.8

FLUID CLEANLINESS

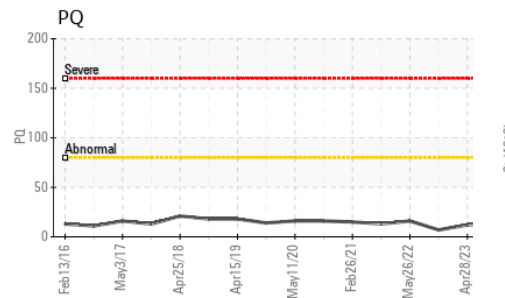
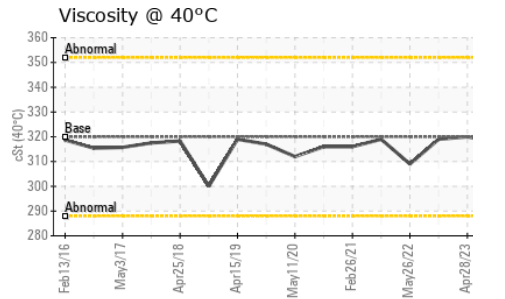
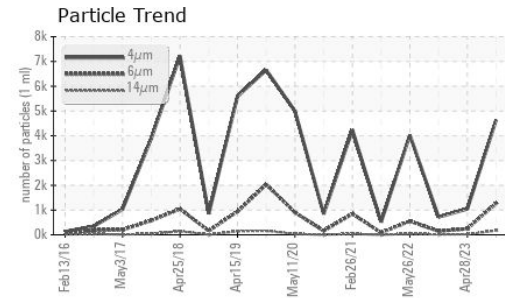
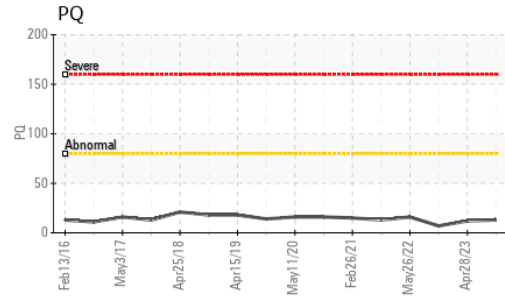
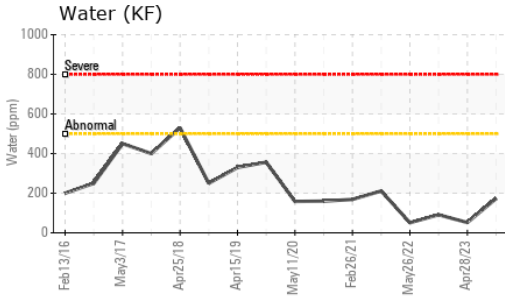
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		4635	1045	718
Particles >6µm	ASTM D7647	>2500	1273	244	147
Particles >14µm	ASTM D7647	>320	171	22	16
Particles >21µm	ASTM D7647	>80	48	4	4
Particles >38µm	ASTM D7647	>20	2	0	2
Particles >71µm	ASTM D7647	>4	0	0	1
Oil Cleanliness	ISO 4406 (c)	>--/18/15	19/17/15	17/15/12	17/14/11

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	1.6	0.56	0.69



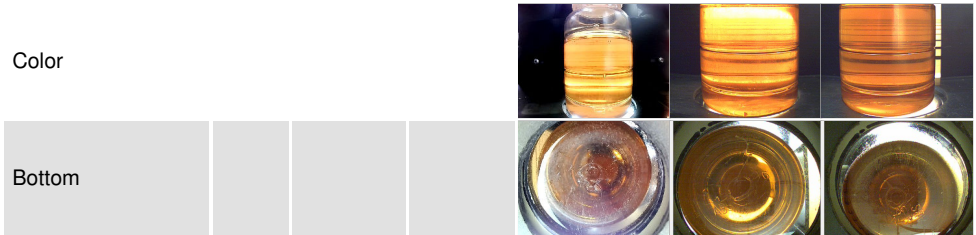
OIL ANALYSIS REPORT



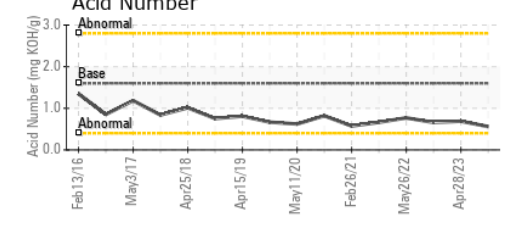
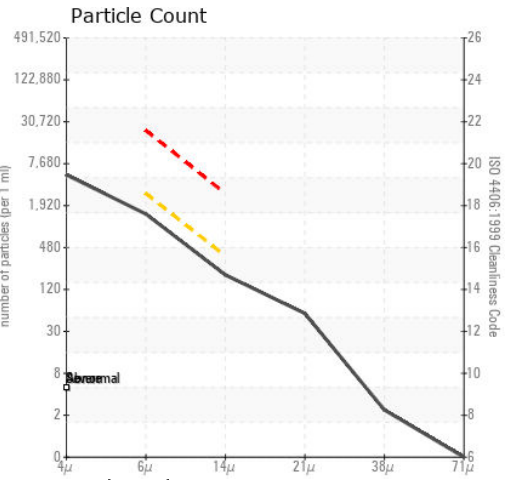
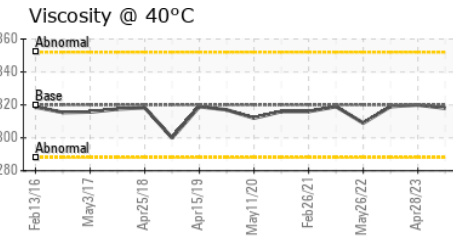
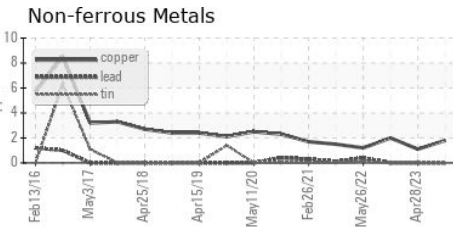
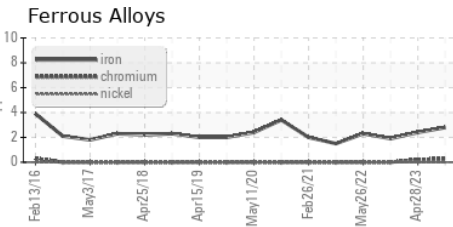
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance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

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445 320	318	320	319

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. : NX014770
 Lab Number : 06027716
 Unique Number : 10777507
 Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

NORDEX USA - Chicago
 300 SOUTH WACKER DRIVE, SUITE 1500
 CHICAGO, IL
 US 60606
 Contact: DEVIN LINEHAN
 DLinehan@nordex-online.com
 T: (312)386-4124
 F: (312)386-7102

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)