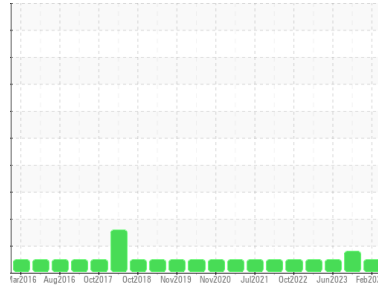




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area
THUNDER SPIRIT [200005313]
 Machine Id
09WEA84017 (S/N 72802187430)
 Component
Wind Turbine Gearbox
 Fluid
CASTROL OPTIGEAR SYNTHETIC X 320 (--- LTR)

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 oil. The amount and size of particulates present in the system are 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		NX015555	NX014803	NX013587
Sample Date	Client Info		20 Feb 2024	12 Oct 2023	13 Jun 2023
Machine Age	hrs	Client Info	24842	52305	56173
Oil Age	hrs	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			NORMAL	ABNORMAL	NORMAL

WEAR METALS

	method	limit/base	current	history1	history2
PQ	ASTM D8184	>80	17	14	12
Iron	ppm	ASTM D5185m	>150	18	23
Chromium	ppm	ASTM D5185m	>5	0	<1
Nickel	ppm	ASTM D5185m	>10	0	<1
Titanium	ppm	ASTM D5185m	>10	0	<1
Silver	ppm	ASTM D5185m		0	0
Aluminum	ppm	ASTM D5185m	>10	7	12
Lead	ppm	ASTM D5185m	>20	0	0
Copper	ppm	ASTM D5185m	>50	0	<1
Tin	ppm	ASTM D5185m	>10	0	0
Vanadium	ppm	ASTM D5185m		0	0
Cadmium	ppm	ASTM D5185m		0	<1

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		32	0
Barium	ppm	ASTM D5185m		0	4
Molybdenum	ppm	ASTM D5185m	1150	915	928
Manganese	ppm	ASTM D5185m		<1	<1
Magnesium	ppm	ASTM D5185m		0	4
Calcium	ppm	ASTM D5185m	2000	1845	1721
Phosphorus	ppm	ASTM D5185m	400	356	365
Zinc	ppm	ASTM D5185m	0	0	0
Sulfur	ppm	ASTM D5185m	1850	2318	2324

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	10	11
Sodium	ppm	ASTM D5185m	>20	0	0
Potassium	ppm	ASTM D5185m	>20	0	2
Water	%	ASTM D6304	>0.05	0.008	0.028
ppm Water	ppm	ASTM D6304	>500	88	281.3

FLUID CLEANLINESS

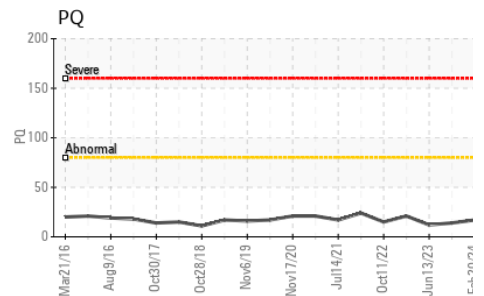
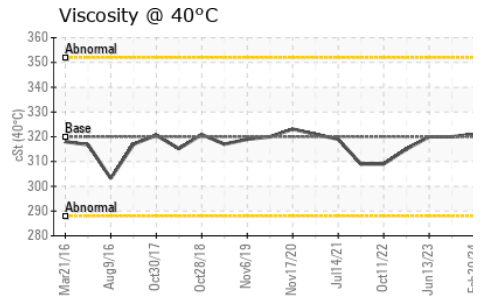
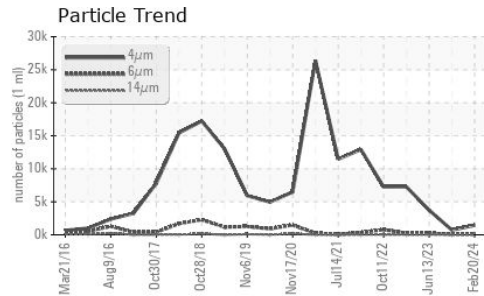
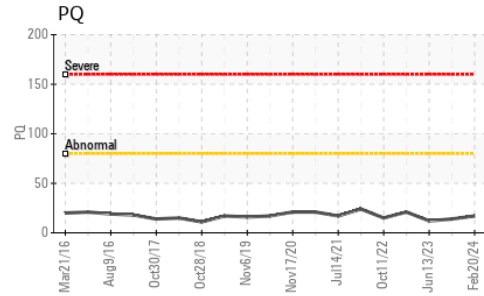
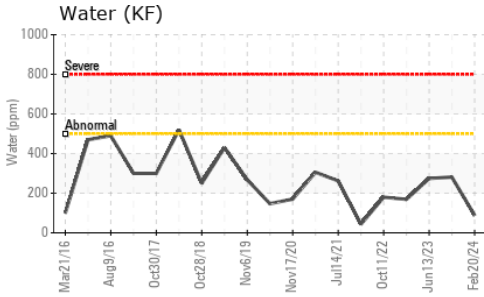
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		1444	720	3737
Particles >6µm	ASTM D7647	>2500	130	103	225
Particles >14µm	ASTM D7647	>320	9	13	20
Particles >21µm	ASTM D7647	>80	2	6	6
Particles >38µm	ASTM D7647	>20	0	1	0
Particles >71µm	ASTM D7647	>4	0	0	0
Oil Cleanliness	ISO 4406 (c)	>--/18/15	18/14/10	17/14/11	19/15/11

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	1.6	0.83	0.61



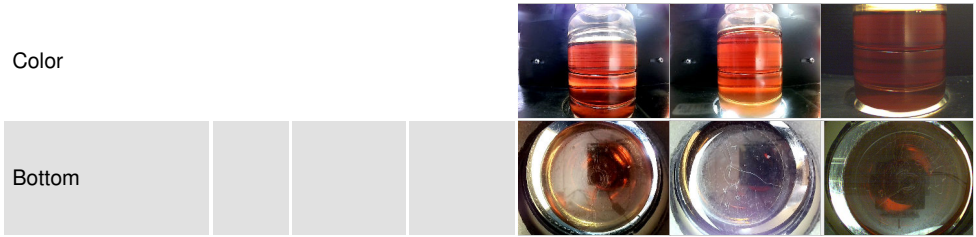
OIL ANALYSIS REPORT



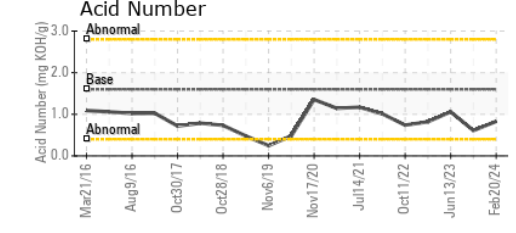
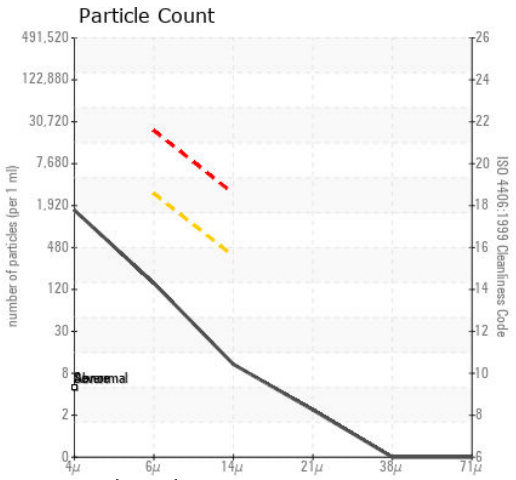
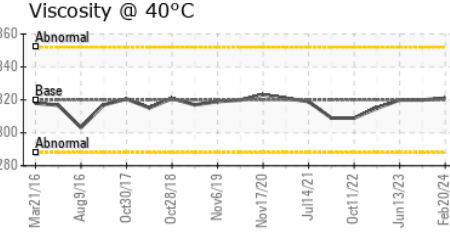
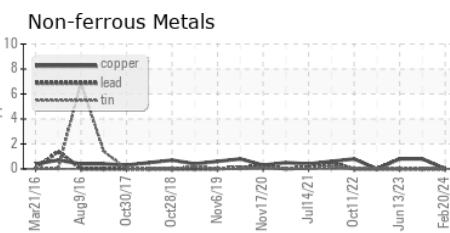
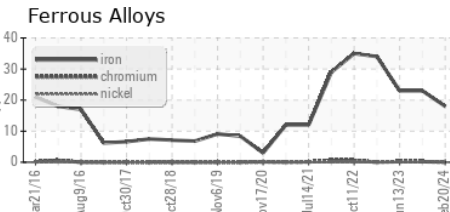
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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	321	320	320

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. : NX015555
 Lab Number : 06123098
 Unique Number : 10937249
 Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

Received : 19 Mar 2024
 Tested : 20 Mar 2024
 Diagnosed : 21 Mar 2024 - Angela Borella

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)