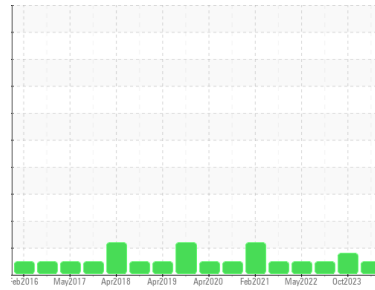




# OIL ANALYSIS REPORT

Sample Rating Trend



**NORMAL**



Area  
**THUNDER SPIRIT [200005313]**  
 Machine Id  
**36WEA84028 (S/N EWP01524)**

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 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		<b>NX014480</b>	NX014758	NX013616
Sample Date	Client Info		<b>20 Feb 2024</b>	18 Oct 2023	02 Aug 2023
Machine Age	hrs	Client Info	<b>0</b>	55168	53829
Oil Age	hrs	Client Info	<b>0</b>	0	0
Oil Changed	Client Info		<b>N/A</b>	N/A	N/A
Sample Status			<b>NORMAL</b>	ABNORMAL	NORMAL

## WEAR METALS

	method	limit/base	current	history1	history2	
PQ	ASTM D8184	>80	<b>11</b>	8	7	
Iron	ppm	ASTM D5185m	>150	<b>&lt;1</b>	4	4
Chromium	ppm	ASTM D5185m	>5	<b>0</b>	<1	0
Nickel	ppm	ASTM D5185m	>10	<b>0</b>	<1	0
Titanium	ppm	ASTM D5185m	>10	<b>0</b>	<1	0
Silver	ppm	ASTM D5185m		<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>10	<b>7</b>	▲ 11	0
Lead	ppm	ASTM D5185m	>20	<b>0</b>	0	0
Copper	ppm	ASTM D5185m	>50	<b>&lt;1</b>	2	2
Tin	ppm	ASTM D5185m	>10	<b>&lt;1</b>	0	0
Vanadium	ppm	ASTM D5185m		<b>0</b>	0	0
Cadmium	ppm	ASTM D5185m		<b>0</b>	<1	0

## ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		<b>30</b>	0	0
Barium	ppm	ASTM D5185m		<b>0</b>	3	6
Molybdenum	ppm	ASTM D5185m	1150	<b>875</b>	856	936
Manganese	ppm	ASTM D5185m		<b>0</b>	0	0
Magnesium	ppm	ASTM D5185m		<b>0</b>	3	4
Calcium	ppm	ASTM D5185m	2000	<b>1461</b>	1322	1515
Phosphorus	ppm	ASTM D5185m	400	<b>452</b>	459	480
Zinc	ppm	ASTM D5185m	0	<b>23</b>	30	44
Sulfur	ppm	ASTM D5185m	1850	<b>2266</b>	2309	2205

## CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>50	<b>8</b>	9	8
Sodium	ppm	ASTM D5185m	>20	<b>2</b>	3	0
Potassium	ppm	ASTM D5185m	>20	<b>0</b>	2	2
Water	%	ASTM D6304	>0.05	<b>0.005</b>	0.016	0.022
ppm Water	ppm	ASTM D6304	>500	<b>55</b>	160.3	227.3

## FLUID CLEANLINESS

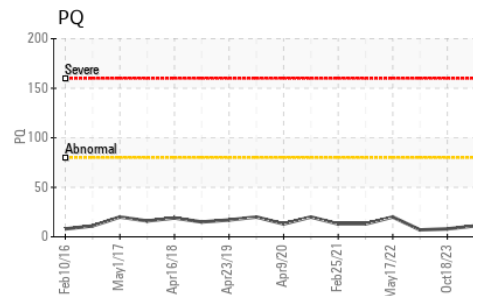
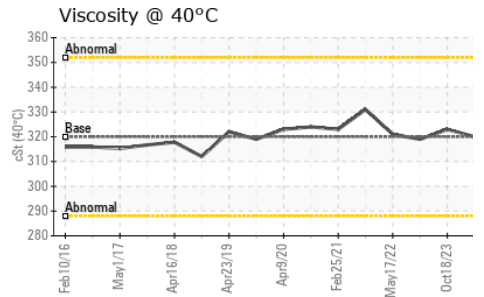
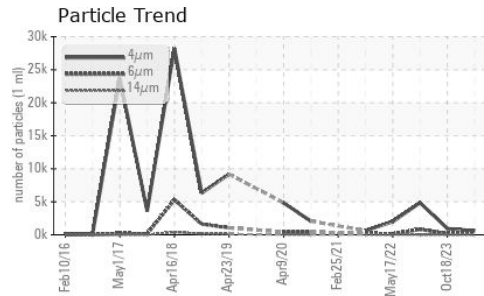
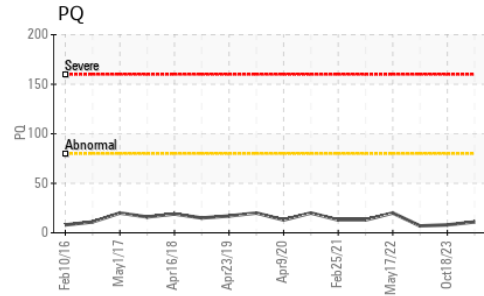
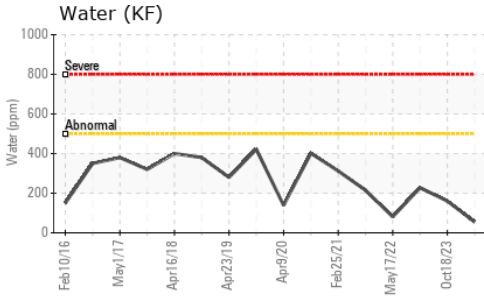
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		<b>609</b>	948	4857
Particles >6µm	ASTM D7647	>2500	<b>189</b>	183	822
Particles >14µm	ASTM D7647	>320	<b>19</b>	17	19
Particles >21µm	ASTM D7647	>80	<b>4</b>	7	5
Particles >38µm	ASTM D7647	>20	<b>0</b>	1	1
Particles >71µm	ASTM D7647	>4	<b>0</b>	0	0
Oil Cleanliness	ISO 4406 (c)	>--/18/15	<b>16/15/11</b>	17/15/11	19/17/11

## FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Acid Number (AN)	mg KOH/g	ASTM D8045	1.6	<b>0.83</b>	0.75	0.99



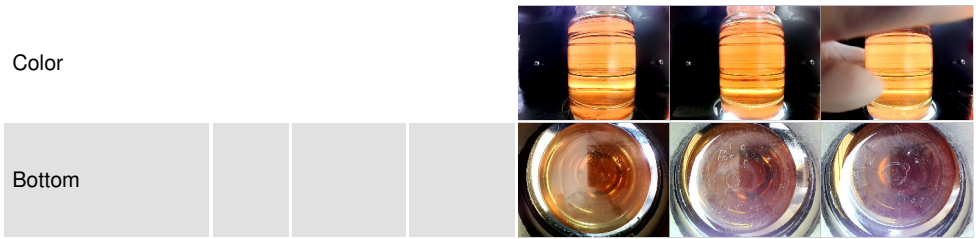
# OIL ANALYSIS REPORT



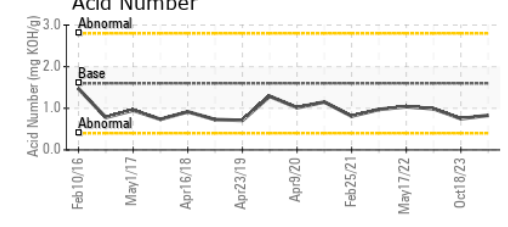
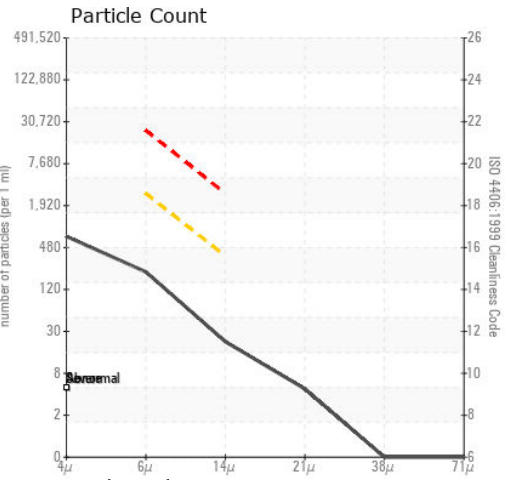
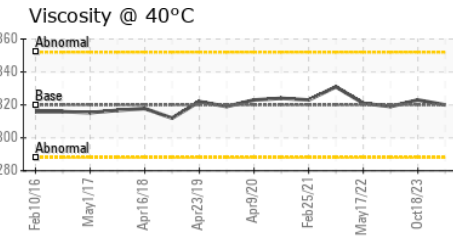
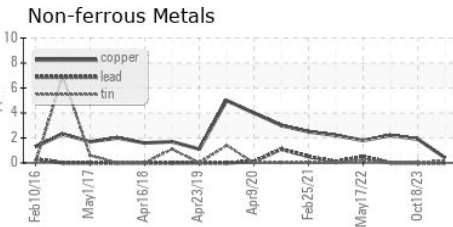
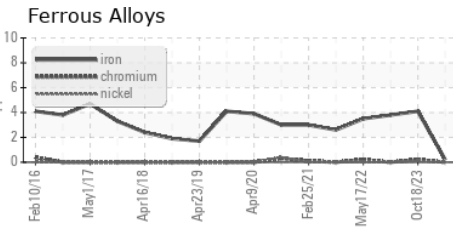
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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	320	323	319

SAMPLE IMAGES	method	limit/base	current	history1	history2
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## GRAPHS



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : NX014480  
**Lab Number** : 06123099  
**Unique Number** : 10937250  
**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**  
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 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)