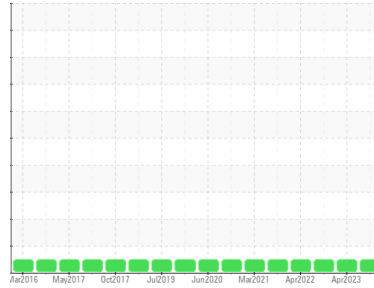




# OIL ANALYSIS REPORT

Sample Rating Trend

**NORMAL**



Area  
**THUNDER SPIRIT [200005313]**  
 Machine Id  
**24WEA84004 (S/N 45541)**  
 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		<b>NX014821</b>	NX011631	NX011696
Sample Date	Client Info		<b>21 Nov 2023</b>	28 Apr 2023	07 Nov 2022
Machine Age	hrs	Client Info	<b>58200</b>	54014	51383
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>	NORMAL	NORMAL

## WEAR METALS

	method	limit/base	current	history1	history2
PQ	ASTM D8184	>80	<b>16</b>	12	4
Iron	ppm	ASTM D5185m	>150	<b>3</b>	3
Chromium	ppm	ASTM D5185m	>5	<b>&lt;1</b>	<1
Nickel	ppm	ASTM D5185m	>10	<b>0</b>	0
Titanium	ppm	ASTM D5185m	>10	<b>&lt;1</b>	0
Silver	ppm	ASTM D5185m		<b>0</b>	0
Aluminum	ppm	ASTM D5185m	>10	<b>5</b>	0
Lead	ppm	ASTM D5185m	>20	<b>0</b>	0
Copper	ppm	ASTM D5185m	>50	<b>1</b>	1
Tin	ppm	ASTM D5185m	>10	<b>0</b>	<1
Vanadium	ppm	ASTM D5185m		<b>0</b>	0
Cadmium	ppm	ASTM D5185m		<b>0</b>	0

## ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		<b>0</b>	14
Barium	ppm	ASTM D5185m		<b>8</b>	0
Molybdenum	ppm	ASTM D5185m	1150	<b>665</b>	629
Manganese	ppm	ASTM D5185m		<b>0</b>	0
Magnesium	ppm	ASTM D5185m		<b>5</b>	6
Calcium	ppm	ASTM D5185m	2000	<b>1174</b>	1219
Phosphorus	ppm	ASTM D5185m	400	<b>341</b>	325
Zinc	ppm	ASTM D5185m	0	<b>0</b>	0
Sulfur	ppm	ASTM D5185m	1850	<b>1728</b>	2052

## CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	<b>10</b>	9
Sodium	ppm	ASTM D5185m	>20	<b>4</b>	4
Potassium	ppm	ASTM D5185m	>20	<b>2</b>	<1
Water	%	ASTM D6304	>0.05	<b>0.017</b>	0.006
ppm Water	ppm	ASTM D6304	>500	<b>177</b>	68.7

## FLUID CLEANLINESS

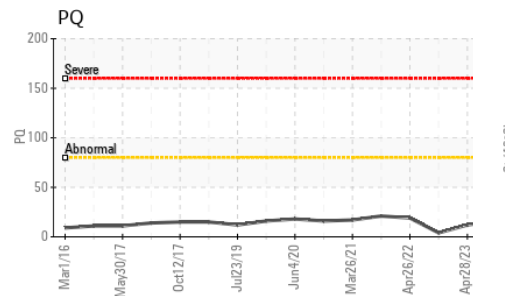
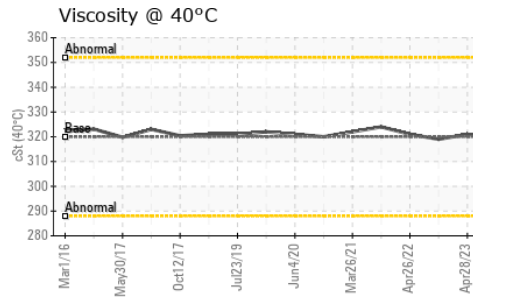
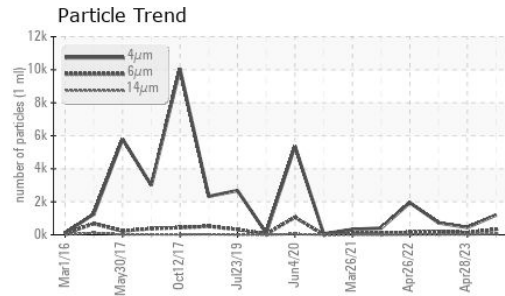
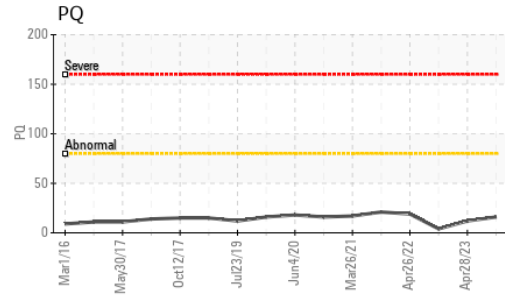
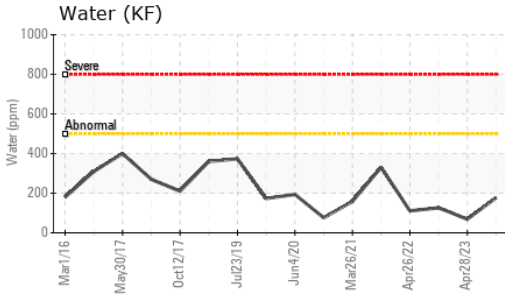
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		<b>1203</b>	446	724
Particles >6µm	ASTM D7647	>2500	<b>339</b>	128	207
Particles >14µm	ASTM D7647	>320	<b>50</b>	16	22
Particles >21µm	ASTM D7647	>80	<b>14</b>	4	5
Particles >38µm	ASTM D7647	>20	<b>1</b>	1	0
Particles >71µm	ASTM D7647	>4	<b>0</b>	0	0
Oil Cleanliness	ISO 4406 (c)	>--/18/15	<b>17/16/13</b>	16/14/11	17/15/12

## FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	1.6	<b>0.43</b>	0.51



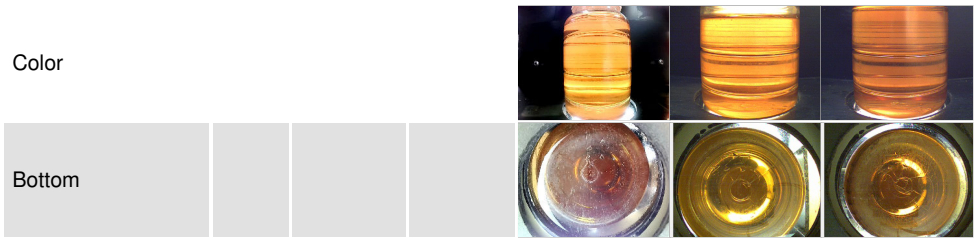
# OIL ANALYSIS REPORT



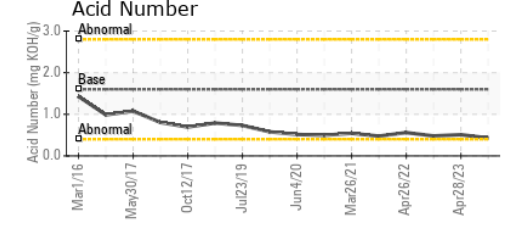
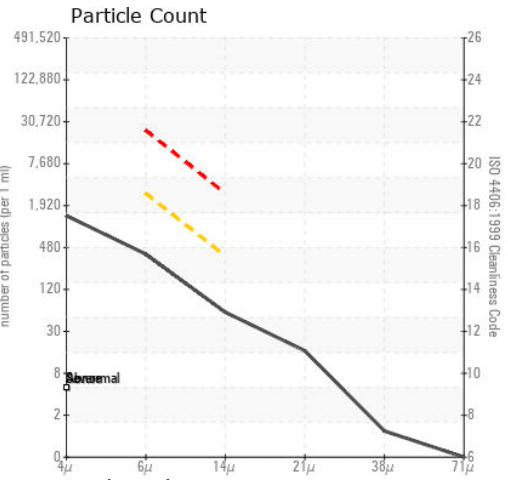
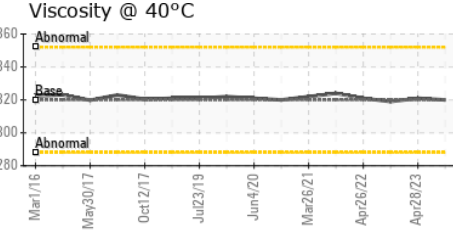
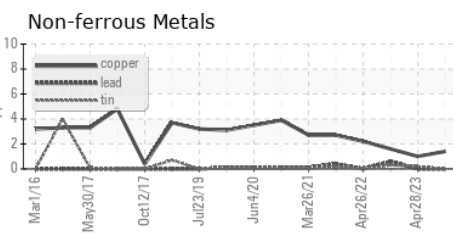
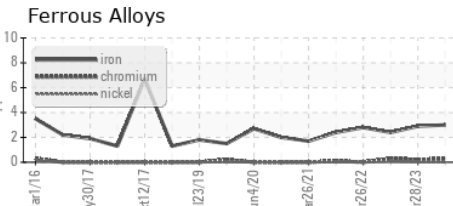
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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	321	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.** : NX014821 **Received** : 07 Dec 2023  
**Lab Number** : 06027719 **Diagnosed** : 08 Dec 2023  
**Unique Number** : 10777510 **Diagnostician** : Doug Bogart  
**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

Certificate L2367  
 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)