



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Area
THUNDER SPIRIT [200009532]

Machine Id
39WEA84008 (S/N EWP00749)

Component
Wind Turbine Gearbox

Fluid
CASTROL OPTIGEAR SYNTHETIC X 320 (--- QTS)

RECOMMENDATION

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor. We were unable to perform a particle count due to a high concentration of particles present in this sample.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		NX016588	NX014829	NX011689
Sample Date		Client Info		03 May 2024	19 Oct 2023	09 Aug 2023
Machine Age	hrs	Client Info		61155	57186	56006
Oil Age	hrs	Client Info		0	0	0
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				ABNORMAL	NORMAL	ATTENTION

WEAR

All component wear rates are normal.

PQ	UOM	Method	Limit/Abn	Current	History1	History2
Iron	ppm	ASTM D5185m	>150	1	0	2
Chromium	ppm	ASTM D5185m	>5	0	0	<1
Nickel	ppm	ASTM D5185m	>10	0	<1	0
Titanium	ppm	ASTM D5185m	>10	0	0	<1
Silver	ppm	ASTM D5185m		<1	<1	0
Aluminum	ppm	ASTM D5185m	>10	3	8	0
Lead	ppm	ASTM D5185m	>20	0	<1	<1
Copper	ppm	ASTM D5185m	>50	<1	0	2
Tin	ppm	ASTM D5185m	>10	0	<1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

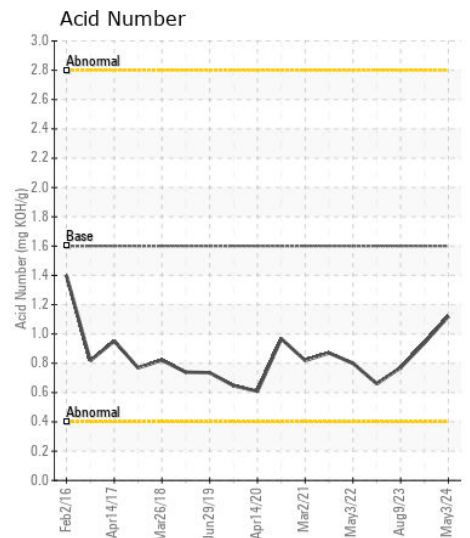
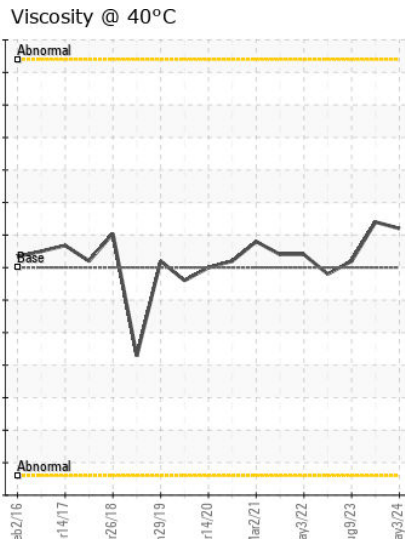
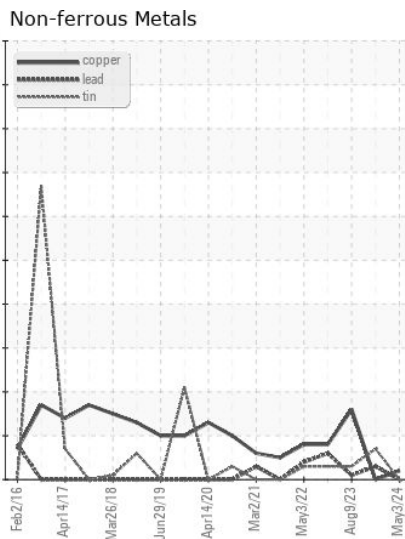
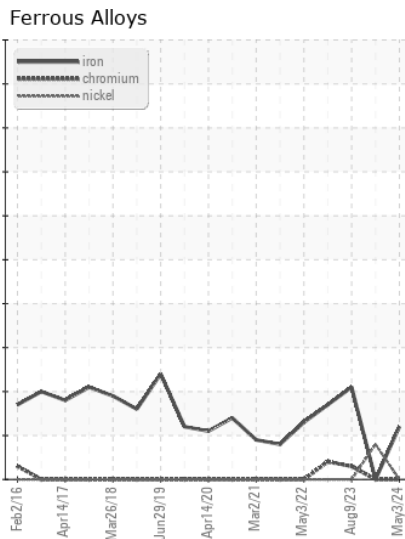
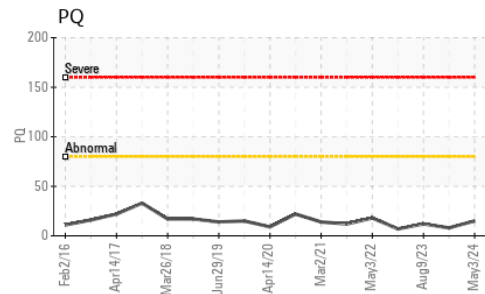
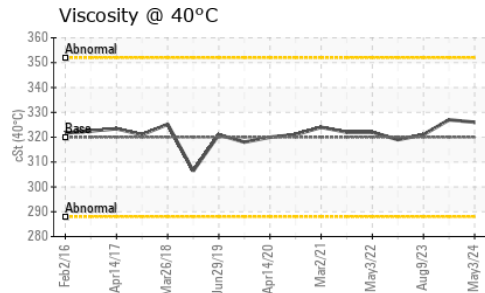
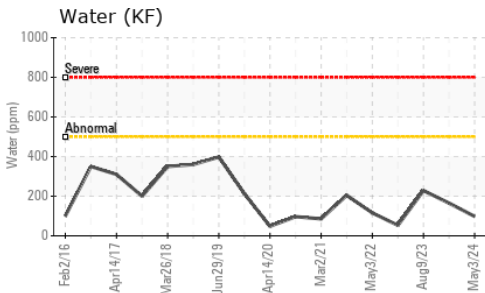
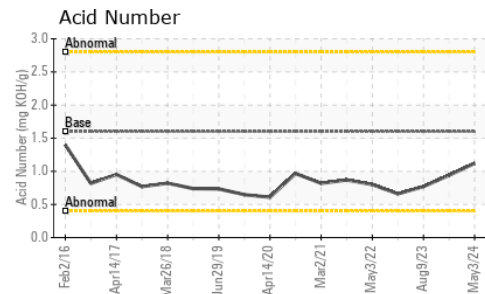
Moderate concentration of visible dirt/debris present in the oil.

Silicon	ppm	ASTM D5185m	>50	9	9	8
Potassium	ppm	ASTM D5185m	>20	0	2	1
Water	%	ASTM D6304	>0.05	0.009	0.016	0.022
ppm Water	ppm	ASTM D6304	>500	98	165	228.3
Particles >4µm		ASTM D7647		---	914	21967
Particles >6µm		ASTM D7647	>2500	---	96	3048
Particles >14µm		ASTM D7647	>320	---	10	178
Particles >21µm		ASTM D7647	>80	---	2	36
Particles >38µm		ASTM D7647	>20	---	1	2
Particles >71µm		ASTM D7647	>4	---	0	2
Oil Cleanliness		ISO 4406 (c)	>-/18/15	---	17/14/10	22/19/15
Silt	scalar	*Visual	NONE	NONE	NONE	LIGHT
Debris	scalar	*Visual	NONE	▲ MODER	NONE	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

FLUID CONDITION

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m	>20	4	<1	4
Boron	ppm	ASTM D5185m		0	24	0
Barium	ppm	ASTM D5185m		0	<1	0
Molybdenum	ppm	ASTM D5185m	1150	873	788	738
Manganese	ppm	ASTM D5185m		0	0	<1
Magnesium	ppm	ASTM D5185m		0	9	5
Calcium	ppm	ASTM D5185m	2000	1692	1526	1299
Phosphorus	ppm	ASTM D5185m	400	351	318	328
Zinc	ppm	ASTM D5185m	0	0	0	0
Sulfur	ppm	ASTM D5185m	1850	2118	1955	1754
Acid Number (AN)	mg KOH/g	ASTM D8045	1.6	1.12	0.94	0.77
Visc @ 40°C	cSt	ASTM D445	320	326	327	321



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : NX016588

Lab Number : 06190437

Unique Number : 11047189

Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

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)

Received : 24 May 2024

Tested : 29 May 2024

Diagnosed : 29 May 2024 - Don Baldrige

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