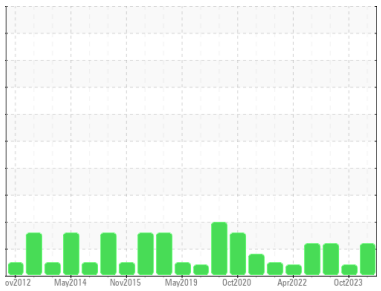
OIL ANALYSIS REPORT

Sample Rating Trend



ADDITIVES

Area
ROTH ROCK [200005321]
Machine Id
09WEA81553
Component
Wind Turbine Gearbox
Fluid
CASTROL OPTIGEAR SYNTHETIC A ISO 320 (--- LTR)

DIAGNOSIS

Recommendation
No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is a high amount of silt (particulates < 14 microns in size) present in the oil.

Fluid Condition
An additive depletion is indicated. The AN level is acceptable for this fluid.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**NX016948**	NX012211	NX012212
Sample Date		Client Info		**22 Apr 2024**	12 Oct 2023	22 Mar 2023
Machine Age	hrs	Client Info		**0**	0	0
Oil Age	hrs	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**ABNORMAL**	ATTENTION	ABNORMAL

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184	>80	**27**	20	18
Iron	ppm	ASTM D5185m	>150	**81**	58	59
Chromium	ppm	ASTM D5185m	>5	**1**	<1	<1
Nickel	ppm	ASTM D5185m	>10	**0**	0	<1
Titanium	ppm	ASTM D5185m	>10	**<1**	0	<1
Silver	ppm	ASTM D5185m		**<1**	0	0
Aluminum	ppm	ASTM D5185m	>10	**2**	6	<1
Lead	ppm	ASTM D5185m	>20	**0**	0	<1
Copper	ppm	ASTM D5185m	>50	**1**	2	1
Tin	ppm	ASTM D5185m	>10	**<1**	0	<1
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**<1**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	**0**	9	0
Barium	ppm	ASTM D5185m	0	**0**	0	0
Molybdenum	ppm	ASTM D5185m	1150	**435**	472	524
Manganese	ppm	ASTM D5185m		**2**	2	2
Magnesium	ppm	ASTM D5185m	1800	**1663**	1558	1607
Calcium	ppm	ASTM D5185m	20	**10**	12	11
Phosphorus	ppm	ASTM D5185m	1450	**1134**	1117	1170
Zinc	ppm	ASTM D5185m	1650	**1217**	1265	1307
Sulfur	ppm	ASTM D5185m	4900	**5839**	4817	5653

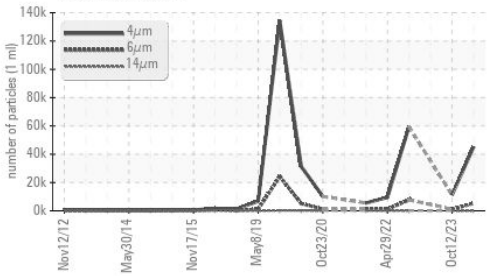
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	**8**	9	9
Sodium	ppm	ASTM D5185m	>20	**22**	24	24
Potassium	ppm	ASTM D5185m	>20	**<1**	0	2
Water	%	ASTM D6304	>0.1	**0.022**	0.079	0.044
ppm Water	ppm	ASTM D6304	>1000	**221**	799	448.2

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**45196**	11165	---
Particles >6µm		ASTM D7647	>2500	**5272**	974	---
Particles >14µm		ASTM D7647	>320	**37**	21	---
Particles >21µm		ASTM D7647	>80	**5**	7	---
Particles >38µm		ASTM D7647	>20	**0**	1	---
Particles >71µm		ASTM D7647	>4	**0**	0	---
Oil Cleanliness		ISO 4406 (c)	>--/18/15	**23/20/12**	21/17/12	---

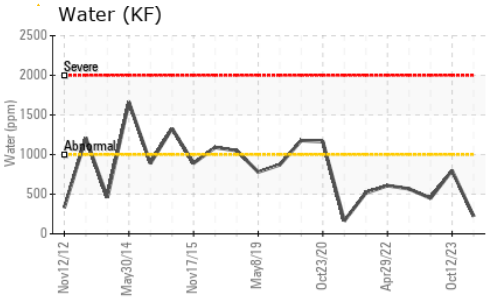
FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	3.3	**1.56**	2.48	1.45

OIL ANALYSIS REPORT

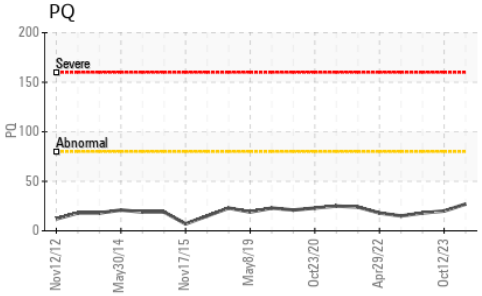
Particle Trend



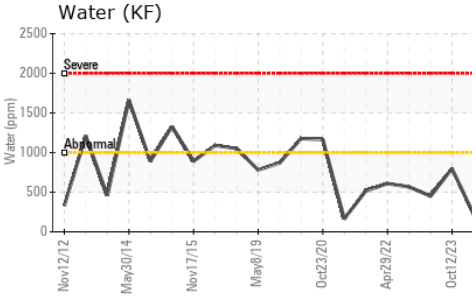
Water (KF)



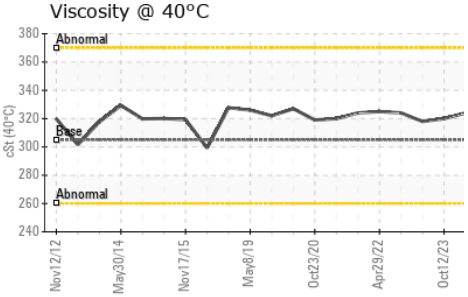
PQ



Water (KF)

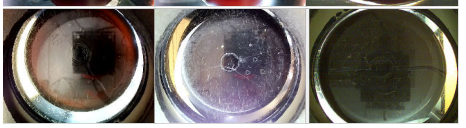


Viscosity @ 40°C



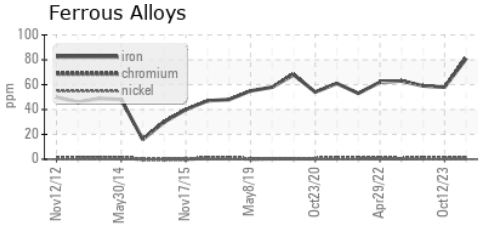
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	▲ HEAVY
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	305	**324**	320	318

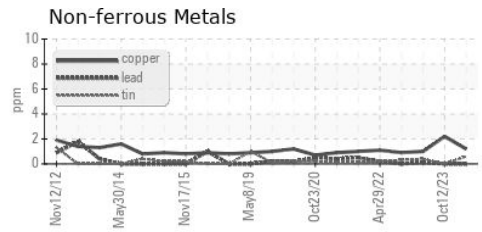
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

GRAPHS

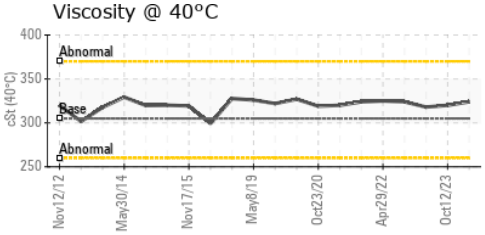
Ferrous Alloys



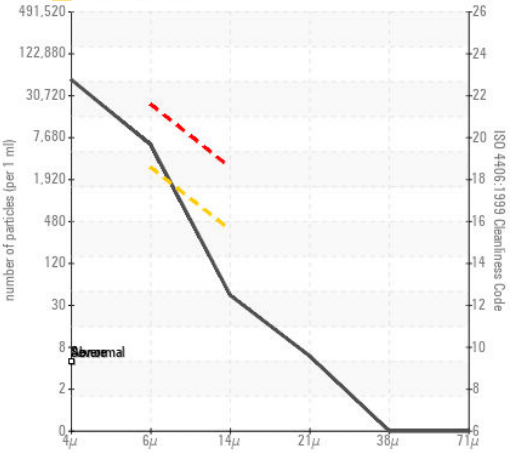
Non-ferrous Metals



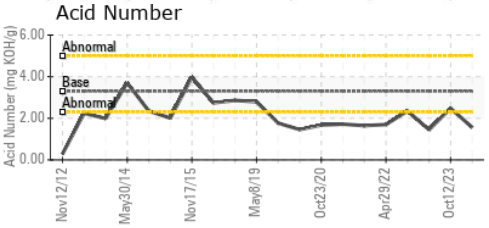
Viscosity @ 40°C



Particle Count



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : NX016948
Lab Number : 06182832
Unique Number : 11034158
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

Received : 17 May 2024
Tested : 22 May 2024
Diagnosed : 22 May 2024 - Don Baldridge

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)

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