

PROBLEM SUMMARY

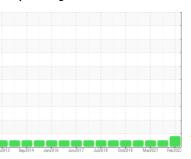
WINERGY GEARBOX WTG-202 (S/N 4836487-0020-1)

Wind Turbine Gearbox

FUCHS RENOLIN UNISYN CKC ISO 320 (340 LTR)

COMPONENT CONDITION SUMMARY







No relevant graphs to display

RECOMMENDATION

We recommend you service the filters on this component. 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.

| PROBLEMATIC TEST RESULTS | | | | | | | | |
|--------------------------|--------|---------|------|----------|--------|--------|--|--|
| Sample Status | | | | ABNORMAL | NORMAL | NORMAL | | |
| Silt | scalar | *Visual | NONE | MODER | NONE | NONE | | |

Customer Id: ENEFRA **Sample No.:** WC0804492 Lab Number: 05857957 Test Package: IND 2

To manage this report scan the QR code

To discuss the diagnosis or test data:

Don Baldridge +1 don.b505@comcast.net

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---------------|--------|------|---------|---|
| Change Filter | | | ? | We recommend you service the filters on this component. |
| Alert | | | ? | We were unable to perform a particle count due to a high concentration of particles present in this sample. |

HISTORICAL DIAGNOSIS

26 Jan 2022 Diag: Don Baldridge

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



06 Mar 2021 Diag: Don Baldridge

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. The water content is negligible. The amount and size of particulates present in the system are acceptable. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



24 Jul 2020 Diag: Doug Bogart

NORMAL



Resample at the next service interval to monitor. All ferrographic tests and evaluation performed at WC Canada laboratory. All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



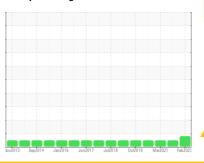


OIL ANALYSIS REPORT

WINERGY GEARBOX WTG-202 (S/N 4836487-0020-1)

Wind Turbine Gearbox

FUCHS RENOLIN UNISYN CKC ISO 320 (340 LTR)



Sample Rating Trend



DIAGNOSIS

Recommendation

We recommend you service the filters on this component. 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.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of visible silt present in the sample.

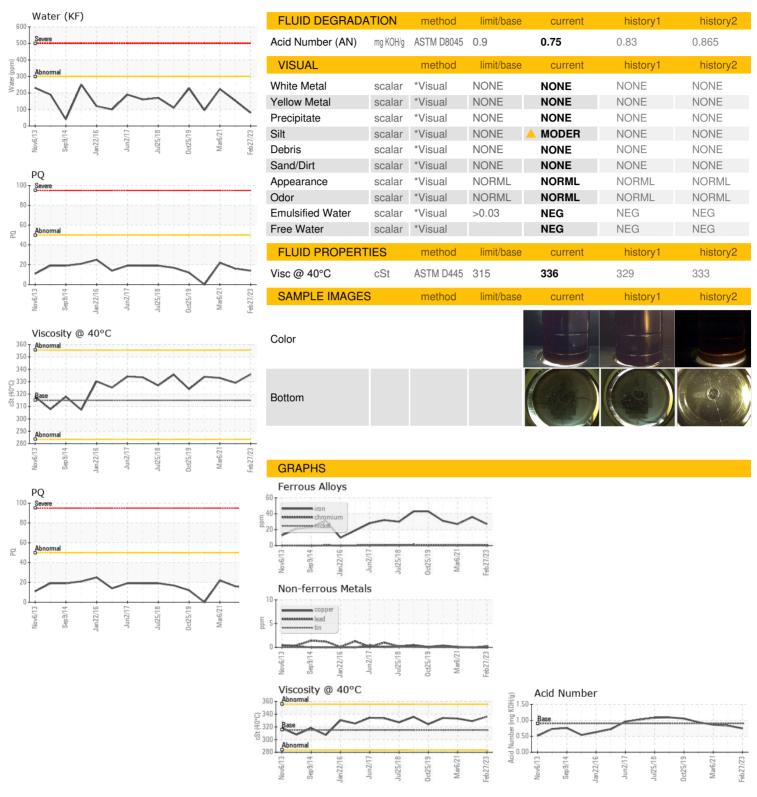
Fluid Condition

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

| Sample Number Client Info WC0804492 WC05504524 WC055 Sample Date Client Info 27 Feb 2023 26 Jan 2022 06 Mar Machine Age yrs Client Info 7 74 120 120 06 Machine Age yrs Client Info 7 0 65 06 06 06 06 06 06 | o Em, | | Vov2013 Sep | 2014 Jan2016 Jun20 | 17 Jul2018 Oct2019 Mar20 | 021 Feb2023 | |
|--|----------------|--------|-------------|--------------------|--------------------------|-------------|-------------|
| Sample Date Client Info 27 Feb 2023 26 Jan 2022 06 Mar Machine Age yrs Client Info 7 74 120 Oil Age yrs Client Info 7 0 65 Oil Changed Client Info N/A N/A Not Och Sample Status BABNORMAL NORMAL NORMAL WEAR METALS method limit/base current history1 his PQ ASTM D8184 >50 14 16 22 Iron ppm ASTM D8185m >65 27 36 27 Chromium ppm ASTM D8185m >3 -1 | SAMPLE INFORM | 1ATION | method | limit/base | current | history1 | history2 |
| Machine Age yrs Client Info 7 74 120 Oil Age yrs Client Info 7 0 65 Oil Changed Client Info N/A N/A N/A N/A N/A No Ch Sample Status method limit/base aBNORMAL NORMAL NORMAL WEAR METALS method limit/base current history1 his PQ ASTM D8184 >50 14 16 22 Iron ppm ASTM D5185m >65 27 36 27 Chromium ppm ASTM D5185m >3 <1 <1 <1 <1 Nickel ppm ASTM D5185m >3 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 | Sample Number | | Client Info | | WC0804492 | WC05504524 | WC0547156 |
| Oil Age yrs Client Info N/A N/A N/A Not on the Normal Sample Status method limit/base current history1 his PQ ASTM D8184 >50 14 16 22 Iron ppm ASTM D5185m >65 27 36 27 Chromium ppm ASTM D5185m >3 -1 -1 -1 -1 Nickel ppm ASTM D5185m >3 0 0 0 0 Nickel ppm ASTM D5185m >10 0 0 0 0 Nickel ppm ASTM D5185m >10 0 0 0 0 0 Silver ppm ASTM D5185m >10 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 | Sample Date | | Client Info | | 27 Feb 2023 | 26 Jan 2022 | 06 Mar 2021 |
| Oil Changed Sample Status Client Info N/A ABNORMAL NORMAL NORM | Machine Age | yrs | Client Info | | 7 | 74 | 120 |
| Sample Status method limit/base current history1 his PQ ASTM D8184 >50 14 16 22 Iron ppm ASTM D8185m >65 27 36 27 Chromium ppm ASTM D8185m >3 0 0 0 Nickel ppm ASTM D8185m >3 0 0 0 Silver ppm ASTM D8185m >10 0 0 0 Aluminum ppm ASTM D8185m >10 0 0 0 Aluminum ppm ASTM D8185m >10 0 0 0 Aluminum ppm ASTM D8185m >10 0 0 0 Copper ppm ASTM D8185m >10 0 0 0 Tin ppm ASTM D8185m >10 0 0 0 Antimony ppm ASTM D8185m >1 0 0 0 < | Oil Age | yrs | Client Info | | 7 | 0 | 65 |
| WEAR METALS method limit/base current history1 his PQ ASTM D8184 >50 14 16 22 Iron ppm ASTM D5185m >56 27 36 27 Chromium ppm ASTM D5185m >3 •1 <1 | Oil Changed | | Client Info | | N/A | N/A | Not Changd |
| PQ ASTM D8184 >50 14 16 22 Iron ppm ASTM D5185m >65 27 36 27 Chromium ppm ASTM D5185m >3 <1 <1 <1 Nickel ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >10 0 0 0 Aluminum ppm ASTM D5185m >10 <1 0 0 Aluminum ppm ASTM D5185m >5 0 0 0 0 Aluminum ppm ASTM D5185m >10 <1 0 0 0 Aluminum ppm ASTM D5185m >10 0 0 <1 0 0 Copper ppm ASTM D5185m >10 0 0 <1 0 0 <1 0 0 <1 0 0 <1 1 0 0 0 0 | Sample Status | | | | ABNORMAL | NORMAL | NORMAL |
| ASTM D5185m September ASTM D5185m S | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Chromium ppm ASTM D5185m >3 <1 <1 <1 Nickel ppm ASTM D5185m >3 0 0 0 Titanium ppm ASTM D5185m >10 0 0 0 Silver ppm ASTM D5185m >10 0 0 0 Aluminum ppm ASTM D5185m >10 <1 0 0 Lead ppm ASTM D5185m >10 0 0 <1 Copper ppm ASTM D5185m >10 0 0 <1 Tin ppm ASTM D5185m >10 <1 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 25 1 0 3 Barium ppm ASTM D5185m 25 1 0 0< | PQ | | ASTM D8184 | >50 | 14 | 16 | 22 |
| Nickel ppm | Iron | ppm | ASTM D5185m | >65 | 27 | 36 | 27 |
| Nickel ppm ASTM D5185m >3 0 0 0 Titanium ppm ASTM D5185m >10 0 0 0 Silver ppm ASTM D5185m 0 <1 | Chromium | ppm | ASTM D5185m | >3 | <1 | <1 | <1 |
| Titanium ppm ASTM D5185m >10 0 0 0 Silver ppm ASTM D5185m 0 <1 0 Aluminum ppm ASTM D5185m >10 <1 0 0 Lead ppm ASTM D5185m >5 0 0 0 0 Copper ppm ASTM D5185m >10 0 0 <1 Tin ppm ASTM D5185m >10 <1 0 0 <1 Antimony ppm ASTM D5185m >0 0 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base current history1 his Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 his Barium ppm ASTM D5185m 0 | Nickel | | ASTM D5185m | >3 | 0 | 0 | 0 |
| Silver | Titanium | | ASTM D5185m | >10 | 0 | 0 | 0 |
| Aluminum | Silver | | ASTM D5185m | | 0 | <1 | 0 |
| Lead ppm ASTM D5185m >5 0 0 0 Copper ppm ASTM D5185m >10 0 0 <1 | | | | >10 | | | |
| Copper ppm ASTM D5185m >10 0 0 <1 Tin ppm ASTM D5185m >10 <1 | | • • | | | | | |
| Tin | | | | | _ | | |
| Antimony | | | | | | | |
| Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 his Boron ppm ASTM D5185m 25 1 0 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 17 3 3 5 Phosphorus ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 5000 4972 4049 2972 CONTAMINANTS method limit/base current history1 | | | | | * * | | |
| Cadmium ppm ASTM D5185m 0 <1 ADDITIVES method limit/base current history1 his Boron ppm ASTM D5185m 25 1 0 3 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 Calcium ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 20 103 122 89 Zinc ppm ASTM D5185m 20 1 9 10 Sulfur ppm ASTM D5185m >15 0 0 0 Solicon ppm ASTM D5185m 2 0 1 Potassium ppm ASTM D5185m 20 1< | • | • • | | /5 | | | |
| ADDITIVES | | | | | _ | | |
| Boron ppm ASTM D5185m 25 1 0 3 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 Calcium ppm ASTM D5185m 17 3 3 5 Phosphorus ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 5000 4972 4049 2972 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >15 0 0 0 Sodium | | ррпп | | | | | |
| Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m <1 | ADDITIVES | | method | | current | | history2 |
| Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m <1 | Boron | ppm | | 25 | | | 3 |
| Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 0 0 0 Calcium ppm ASTM D5185m 17 3 3 5 Phosphorus ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 21 9 10 Sulfur ppm ASTM D5185m 5000 4972 4049 2973 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >15 0 0 0 Sodium ppm ASTM D5185m 2 0 1 1 Potassium ppm ASTM D5185m >20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 | Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Magnesium ppm ASTM D5185m 0 0 0 Calcium ppm ASTM D5185m 17 3 3 5 Phosphorus ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 21 9 10 Sulfur ppm ASTM D5185m 5000 4972 4049 2972 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >15 0 0 0 Sodium ppm ASTM D5185m >20 1 0 1 Potassium ppm ASTM D5185m >20 1 0 14 Water % ASTM D5185m >20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 | Molybdenum | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Calcium ppm ASTM D5185m 17 3 3 5 Phosphorus ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 21 9 10 Sulfur ppm ASTM D5185m 5000 4972 4049 2972 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m 2 0 0 Sodium ppm ASTM D5185m 20 1 0 14 Potassium ppm ASTM D5185m >20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 ppm Water ppm ASTM D6304 >300 79.6 153.1 223 FLUID CLEANLINESS method limit/base current history1 | Manganese | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Phosphorus ppm ASTM D5185m 200 103 122 89 Zinc ppm ASTM D5185m 200 4972 4049 2972 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m 500 0 0 0 Sodium ppm ASTM D5185m 2 0 1 1 Potassium ppm ASTM D5185m 20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 ppm Water ppm ASTM D6304 >300 79.6 153.1 223. FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >21μm ASTM D7647 >160 < | Magnesium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Zinc ppm ASTM D5185m <1 9 10 | Calcium | ppm | ASTM D5185m | 17 | 3 | 3 | 5 |
| Sulfur ppm ASTM D5185m 5000 4972 4049 2972 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >15 0 0 0 Sodium ppm ASTM D5185m 2 0 1 Potassium ppm ASTM D5185m >20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 ppm Water ppm ASTM D6304 >300 79.6 153.1 223. FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >21μm ASTM D7647 >160 8 6 | Phosphorus | ppm | ASTM D5185m | 200 | 103 | 122 | 89 |
| CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >15 0 0 0 Sodium ppm ASTM D5185m 2 0 1 Potassium ppm ASTM D5185m >20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 ppm Water ppm ASTM D6304 >300 79.6 153.1 223. FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Zinc | ppm | ASTM D5185m | | <1 | 9 | 10 |
| Silicon ppm ASTM D5185m >15 0 0 0 Sodium ppm ASTM D5185m 2 0 1 Potassium ppm ASTM D5185m >20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 opm Water ppm ASTM D6304 >300 79.6 153.1 223. FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Sulfur | ppm | ASTM D5185m | 5000 | 4972 | 4049 | 2972 |
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| Potassium ppm ASTM D5185m >20 1 0 14 Water % ASTM D6304 >0.03 0.007 0.015 0.02 opm Water ppm ASTM D6304 >300 79.6 153.1 223. FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Silicon | ppm | ASTM D5185m | >15 | 0 | 0 | 0 |
| Water % ASTM D6304 > 0.03 0.007 0.015 0.02 opm Water ppm ASTM D6304 > 300 79.6 153.1 223. FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Sodium | ppm | ASTM D5185m | | 2 | 0 | 1 |
| ppm Water ppm ASTM D6304 >300 79.6 153.1 223. FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Potassium | ppm | ASTM D5185m | >20 | 1 | 0 | 14 |
| FLUID CLEANLINESS method limit/base current history1 his Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Water | % | ASTM D6304 | >0.03 | 0.007 | 0.015 | 0.022 |
| Particles >4μm ASTM D7647 19683 486 Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | ppm Water | ppm | ASTM D6304 | >300 | 79.6 | 153.1 | 223.6 |
| Particles >6μm ASTM D7647 >5000 2213 71 Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | FLUID CLEANLIN | ESS | method | limit/base | current | history1 | history2 |
| Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Particles >4µm | | ASTM D7647 | | | 19683 | 486 |
| Particles >14μm ASTM D7647 >640 42 13 Particles >21μm ASTM D7647 >160 8 6 | Particles >6µm | | ASTM D7647 | >5000 | | 2213 | 71 |
| Particles >21μm | • | | | | | | |
| | | | | | | | |
| · with the country of | • | | | | | | |
| Particles >71µm ASTM D7647 >10 0 0 | | | | | | | |
| | | | | | | | 16/13/11 |



OIL ANALYSIS REPORT







Laboratory Sample No. Lab Number **Unique Number**

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

: WC0804492 : 05857957 : 10492422

Received

Diagnosed

: 30 May 2023 Diagnostician : Don Baldridge

: 26 May 2023

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.

ENERGIA EOLICA

STA ANA KM25 CARRETERA AL SUR, A 1KM DEL CRUCE FRANCISCO MORAZAN, ZZ

HN Contact: SANTOS DEL CID

sdelcid@dencmi.com

T: x: F: x:

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)