



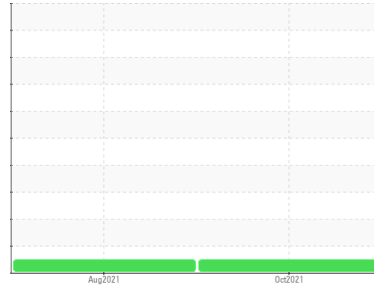
OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Area
FRONTIER II [200006776]
 Machine Id
69WEA86957
 Component
Wind Turbine Gearbox
 Fluid
FUCHS RENOLIN CLP ISO 320 (--- LTR)



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 | | NX05391881 | NX008238 | --- |
| Sample Date | Client Info | | 09 Oct 2021 | 07 Aug 2021 | --- |
| Machine Age | hrs | Client Info | 0 | 0 | --- |
| Oil Age | hrs | Client Info | 0 | 0 | --- |
| Oil Changed | Client Info | | N/A | N/A | --- |
| Sample Status | | | NORMAL | NORMAL | --- |

WEAR METALS

| | method | limit/base | current | history1 | history2 |
|----------|------------|-------------|-----------|--------------|----------|
| PQ | ASTM D8184 | >80 | 20 | 17 | --- |
| Iron | ppm | ASTM D5185m | >150 | 8 | 6 |
| Chromium | ppm | ASTM D5185m | >5 | 0 | 0 |
| Nickel | ppm | ASTM D5185m | >10 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | 0 |
| Silver | ppm | ASTM D5185m | | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >10 | <1 | <1 |
| Lead | ppm | ASTM D5185m | >20 | <1 | 0 |
| Copper | ppm | ASTM D5185m | >50 | <1 | <1 |
| Tin | ppm | ASTM D5185m | | 0 | 0 |
| Antimony | ppm | ASTM D5185m | | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 |

ADDITIVES

| | method | limit/base | current | history1 | history2 |
|------------|--------|-------------|---------|--------------|----------|
| Boron | ppm | ASTM D5185m | | 12 | 8 |
| Barium | ppm | ASTM D5185m | | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 0 | 0 |
| Manganese | ppm | ASTM D5185m | | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | | <1 | 0 |
| Calcium | ppm | ASTM D5185m | | 13 | 3 |
| Phosphorus | ppm | ASTM D5185m | | 93 | 211 |
| Zinc | ppm | ASTM D5185m | | 0 | 0 |
| Sulfur | ppm | ASTM D5185m | | 4259 | 4179 |

CONTAMINANTS

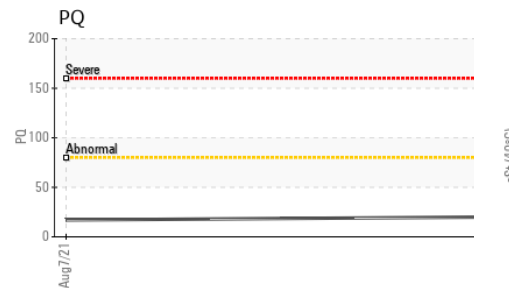
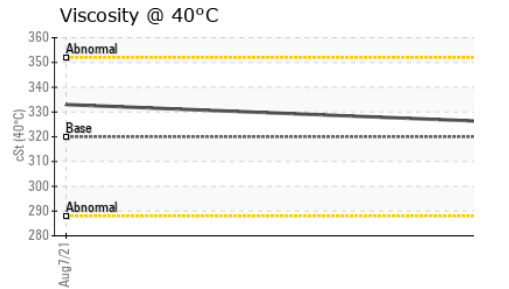
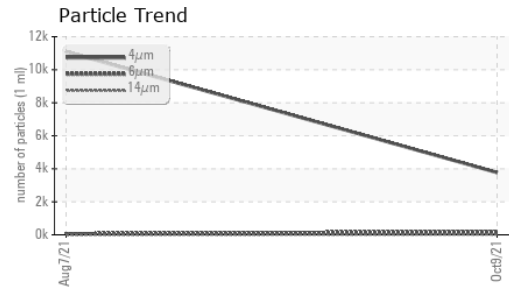
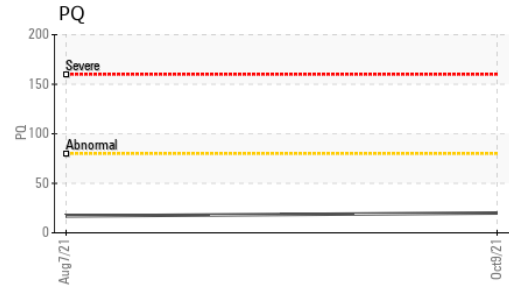
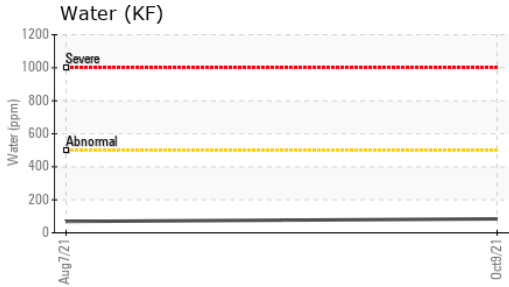
| | method | limit/base | current | history1 | history2 |
|-----------|--------|-------------|---------|--------------|----------|
| Silicon | ppm | ASTM D5185m | >50 | 4 | 2 |
| Sodium | ppm | ASTM D5185m | >20 | 2 | 0 |
| Potassium | ppm | ASTM D5185m | >20 | <1 | 0 |
| Water | % | ASTM D6304 | >0.05 | 0.008 | 0.006 |
| ppm Water | ppm | ASTM D6304 | >500 | 84.4 | 68.9 |

FLUID CLEANLINESS

| | method | limit/base | current | history1 | history2 |
|-----------------|--------------|------------|-----------------|----------|----------|
| Particles >4µm | ASTM D7647 | | 3772 | 11091 | --- |
| Particles >6µm | ASTM D7647 | >2500 | 193 | 62 | --- |
| Particles >14µm | ASTM D7647 | >320 | 18 | 2 | --- |
| Particles >21µm | ASTM D7647 | >80 | 3 | 0 | --- |
| Particles >38µm | ASTM D7647 | >20 | 0 | 0 | --- |
| Particles >71µm | ASTM D7647 | >4 | 0 | 0 | --- |
| Oil Cleanliness | ISO 4406 (c) | >--/18/15 | 19/15/11 | 21/13/9 | --- |



OIL ANALYSIS REPORT

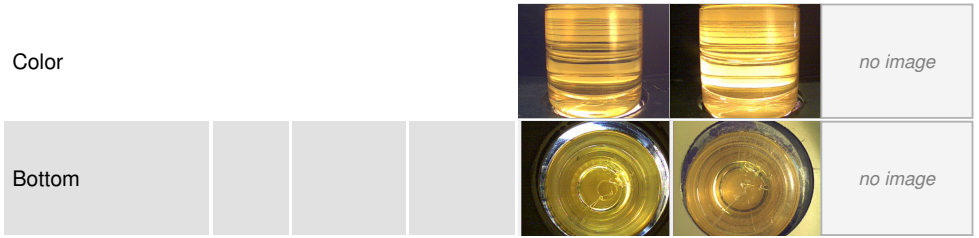


| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|------------|------------|--------------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | 0.478 | 0.440 | --- |

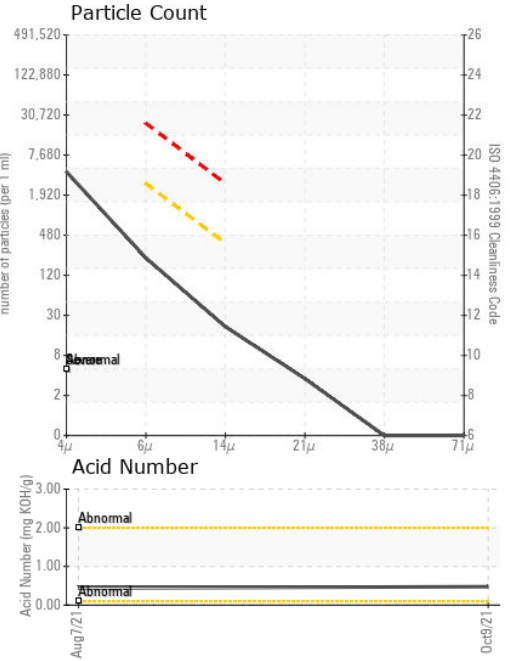
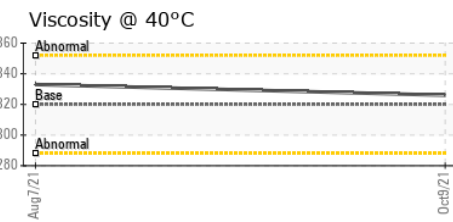
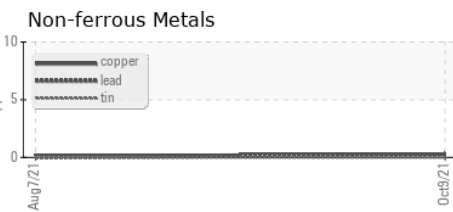
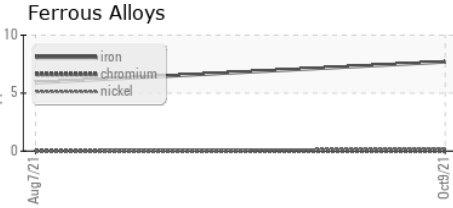
| VISUAL | | method | limit/base | current | history1 | history2 |
|------------------|--------|---------|------------|--------------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | --- |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | --- |
| Precipitate | scalar | *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 | 326 | 333 | --- |

| SAMPLE IMAGES | | method | limit/base | current | history1 | history2 |
|---------------|--|--------|------------|---------|----------|----------|
|---------------|--|--------|------------|---------|----------|----------|



GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : NX05391881 **Received** : 04 Nov 2021
Lab Number : 05391881 **Diagnosed** : 08 Nov 2021
Unique Number : 9726014 **Diagnostician** : Angela Borella
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

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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)