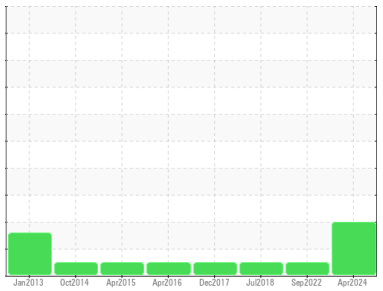
# OIL ANALYSIS REPORT

Sample Rating Trend




ISO

Machine Id
**CHW-001**
Component
**Wind Turbine Gearbox**
Fluid
**MOBIL MOBILGEAR SHC XMP 320 (--- GAL)**

## DIAGNOSIS

**Recommendation**
We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor.

**Wear**
All component wear rates are normal.

**Contamination**
There is a high amount of particulates present in the oil.

**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 | | **WC0925985** | WC0778706 | MHI021171 |
| Sample Date | | Client Info | | **16 Apr 2024** | 07 Sep 2022 | 18 Jul 2018 |
| 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** | NORMAL | NORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| PQ | | ASTM D8184 | >50 | **16** | 7 | 15 |
| Iron | ppm | ASTM D5185m | >30 | **17** | 15 | 4 |
| Chromium | ppm | ASTM D5185m | >3 | **0** | 0 | 0 |
| Nickel | ppm | ASTM D5185m | >3 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >10 | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >30 | **0** | 0 | 0 |
| Lead | ppm | ASTM D5185m | >15 | **0** | <1 | 0 |
| Copper | ppm | ASTM D5185m | >10 | **<1** | 0 | 2 |
| Tin | ppm | ASTM D5185m | >10 | **0** | <1 | 0 |
| Antimony | ppm | ASTM D5185m | >5 | **---** | --- | 0 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

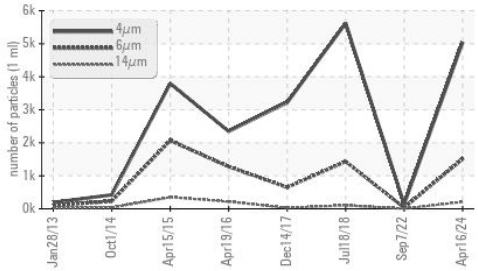
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **0** | 0 | <1 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Manganese | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Calcium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Phosphorus | ppm | ASTM D5185m | 485 | **427** | 395 | 325 |
| Zinc | ppm | ASTM D5185m | 0 | **36** | 16 | 8 |
| Sulfur | ppm | ASTM D5185m | | **5773** | 4745 | 4806 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >+15 | **3** | 6 | 16 |
| Sodium | ppm | ASTM D5185m | >15 | **0** | <1 | <1 |
| Potassium | ppm | ASTM D5185m | >20 | **<1** | 0 | 2 |
| Water | % | ASTM D6304 | >0.02 | **0.013** | 0.008 | 0.010 |
| ppm Water | ppm | ASTM D6304 | >200 | **135** | 87.7 | 100 |

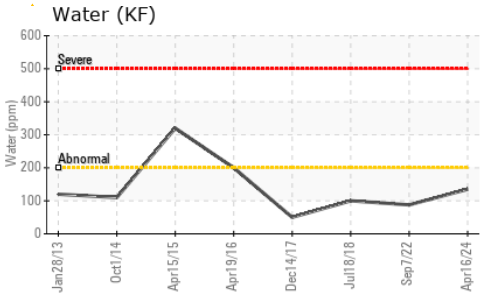
| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | | **5040** | 139 | 5620 |
| Particles >6µm | | ASTM D7647 | >320 | ▲ **1511** | 33 | 1430 |
| Particles >14µm | | ASTM D7647 | >40 | ▲ **209** | 4 | 105 |
| Particles >21µm | | ASTM D7647 | >10 | ▲ **80** | 1 | 26 |
| Particles >38µm | | ASTM D7647 | >3 | ▲ **7** | 0 | 3 |
| Particles >71µm | | ASTM D7647 | >3 | **1** | 0 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >--/15/12 | ▲ **20/18/15** | 14/12/9 | 20/18/14 |

# OIL ANALYSIS REPORT

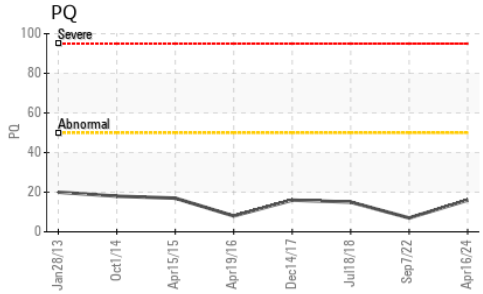
Particle Trend



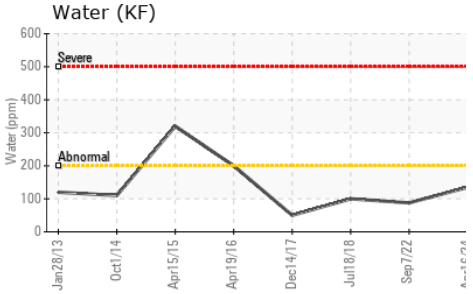

Water (KF)



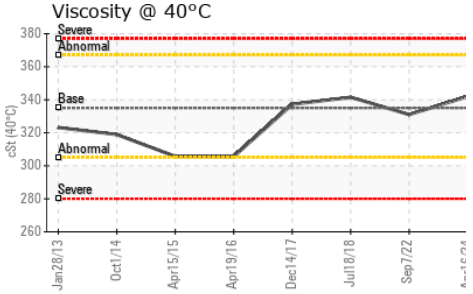

PQ




Water (KF)




Viscosity @ 40°C

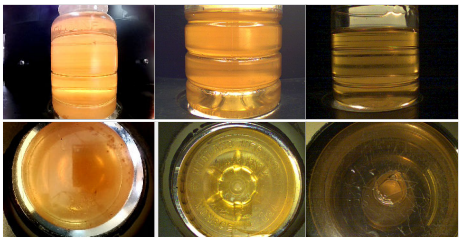



| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.85 | **1.14** | 1.02 | 0.888 |

| 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 | NONE |
| Debris | scalar | *Visual | NONE | **LIGHT** | 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 | >0.02 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

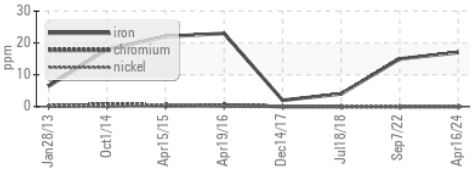
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | 335 | **342** | 331 | 341.5 |

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

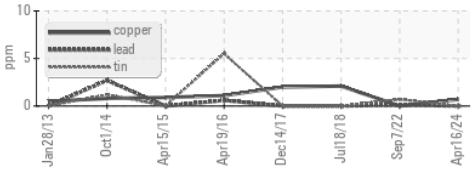


## GRAPHS

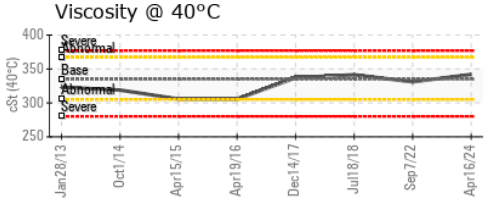
Ferrous Alloys



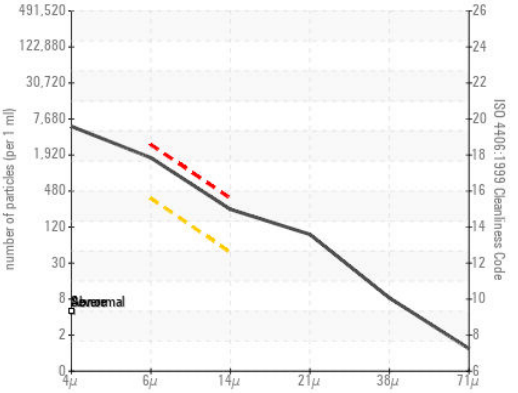

Non-ferrous Metals



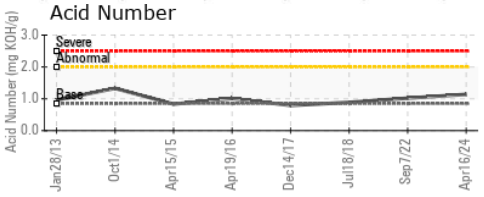

Viscosity @ 40°C




Particle Count




Acid Number




**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0925985 **Received** : 25 Apr 2024
**Lab Number** : 06160374 **Tested** : 26 Apr 2024
**Unique Number** : 10995797 **Diagnosed** : 27 Apr 2024 - Don Baldridge
**Test Package** : IND 2 ( Additional Tests: KF, PQ, PrtCount )

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)*

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