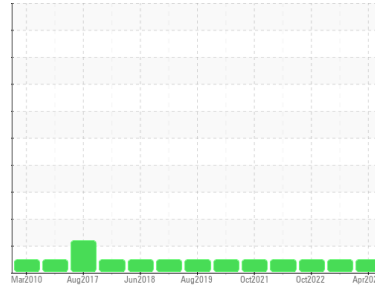




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area
Thompson Falls
 Machine Id
THF01 Generator Lube Oil
 Component
Case Drain Lube System
 Fluid
CONOCO TURBINE OIL 68 (360 GAL)

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 | | | WC0757782 | WC0757771 | WCI2326252 |
| Sample Date | Client Info | | | 23 Apr 2024 | 10 Aug 2023 | 12 Oct 2022 |
| Machine Age | yrs | Client Info | | 17 | 16 | 15 |
| Oil Age | yrs | Client Info | | 17 | 16 | 15 |
| Oil Changed | Client Info | | | Filtered | Filtered | Not Chngd |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---------------|-----------|--------|------------|------------|----------|----------|
| Water | WC Method | | >0.05 | NEG | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|-------------|-----|-------------|------------|----------|----------|----------|
| Iron | ppm | ASTM D5185m | >20 | 0 | 0 | <1 |
| Chromium | ppm | ASTM D5185m | >20 | 0 | 0 | 0 |
| Nickel | ppm | ASTM D5185m | >20 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 0 | 0 | 0 |
| Lead | ppm | ASTM D5185m | >20 | 0 | 0 | 0 |
| Copper | ppm | ASTM D5185m | >20 | 0 | 0 | 0 |
| Tin | ppm | ASTM D5185m | >20 | 0 | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |

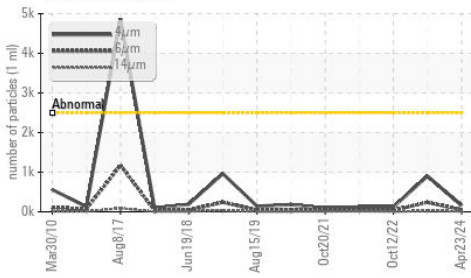
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|------------|-----|-------------|------------|------------|----------|----------|
| Boron | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Manganese | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Magnesium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Calcium | ppm | ASTM D5185m | | 4 | 0 | 2 |
| Phosphorus | ppm | ASTM D5185m | | 9 | 10 | 15 |
| Zinc | ppm | ASTM D5185m | | 3 | 0 | 3 |
| Sulfur | ppm | ASTM D5185m | | 287 | 275 | 284 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|--------------|-----|-------------|------------|--------------|----------|----------|
| Silicon | ppm | ASTM D5185m | >15 | <1 | 0 | <1 |
| Sodium | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Potassium | ppm | ASTM D5185m | >20 | 0 | 0 | <1 |

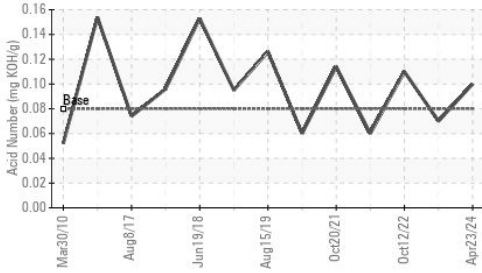
| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|-------------------|--|--------------|------------|-----------------|----------|----------|
| Particles >4µm | | ASTM D7647 | >2500 | 159 | 902 | 121 |
| Particles >6µm | | ASTM D7647 | >640 | 52 | 239 | 35 |
| Particles >14µm | | ASTM D7647 | >80 | 9 | 24 | 4 |
| Particles >21µm | | ASTM D7647 | >20 | 3 | 5 | 1 |
| Particles >38µm | | ASTM D7647 | >4 | 0 | 0 | 0 |
| Particles >71µm | | ASTM D7647 | >3 | 0 | 0 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >18/16/13 | 14/13/10 | 17/15/12 | 14/12/9 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|------------|------------|-------------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.08 | 0.10 | 0.07 | 0.11 |

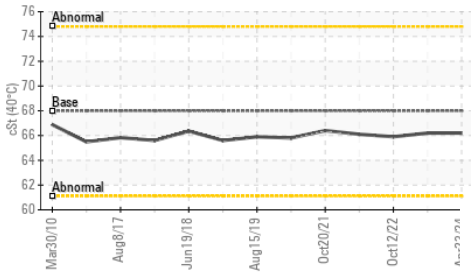
Particle Trend



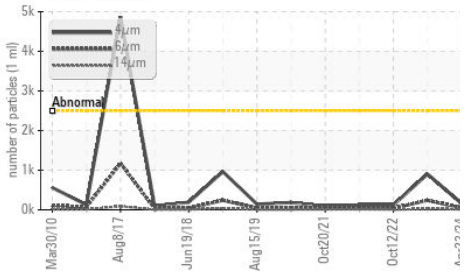
Acid Number



Viscosity @ 40°C



Particle Trend



| 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 68 | 66.2 | 66.2 | 65.9 |

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

Color

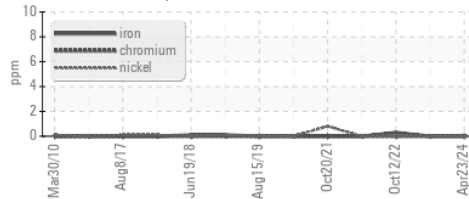


Bottom

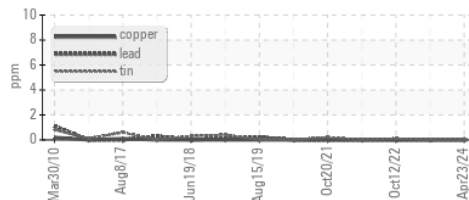


GRAPHS

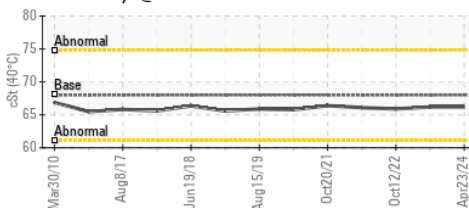
Ferrous Alloys



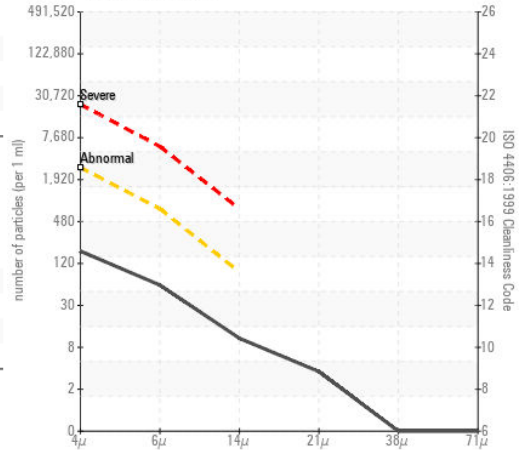
Non-ferrous Metals



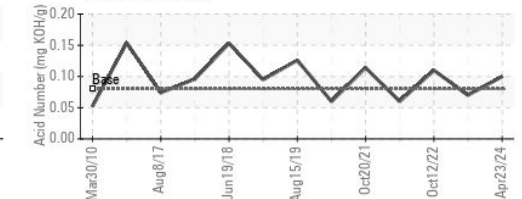
Viscosity @ 40°C



Particle Count



Acid Number



Certificate L2367

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

Sample No. : WC0757782

Lab Number : 06207068

Unique Number : 11074529

Test Package : IND 2

Received : 11 Jun 2024

Tested : 13 Jun 2024

Diagnosed : 13 Jun 2024 - Angela Borella

NORTHWESTERN ENERGY

6700 RAINBOW DAM RD

GREAT FALLS, MT

US 59404

Contact: BRIAN WARD

brian.ward@northwestern.com

T:

F: (406)533-3401

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)