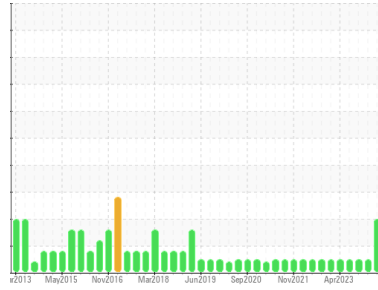




OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area
Black Eagle

Machine Id
BLE02

Component
Reservoir Governor System

Fluid
CONOCO HYDRAULIC AW ISO 46 (--- GAL)

DIAGNOSIS

Recommendation

We recommend you service the filters on this component. 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 oils additive package is suitable for further service.

SAMPLE INFORMATION

| | method | limit/base | current | history1 | history2 |
|---------------|-------------|-------------|--------------------|-------------|-------------|
| Sample Number | Client Info | | WC0926190 | WC0843447 | WC06048772 |
| Sample Date | Client Info | | 18 May 2024 | 29 Feb 2024 | 08 Nov 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 | NORMAL | NORMAL |

CONTAMINATION

| | method | limit/base | current | history1 | history2 |
|-------|-----------|------------|------------|----------|----------|
| Water | WC Method | >0.1 | NEG | NEG | NEG |

WEAR METALS

| | method | limit/base | current | history1 | history2 |
|----------|--------|-----------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m >50 | 2 | 0 | <1 |
| Chromium | ppm | ASTM D5185m >10 | 0 | <1 | 0 |
| Nickel | ppm | ASTM D5185m >10 | <1 | <1 | <1 |
| Titanium | ppm | ASTM D5185m | <1 | 0 | 0 |
| Silver | ppm | ASTM D5185m | <1 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m >3 | <1 | 2 | 0 |
| Lead | ppm | ASTM D5185m >75 | <1 | <1 | 0 |
| Copper | ppm | ASTM D5185m >15 | <1 | <1 | <1 |
| Tin | ppm | ASTM D5185m >55 | <1 | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | <1 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | <1 | 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 | <1 | 0 | 0 |
| Magnesium | ppm | ASTM D5185m | <1 | 0 | 0 |
| Calcium | ppm | ASTM D5185m | 37 | 38 | 49 |
| Phosphorus | ppm | ASTM D5185m | 273 | 215 | 301 |
| Zinc | ppm | ASTM D5185m 3100 | 346 | 318 | 395 |
| Sulfur | ppm | ASTM D5185m | 817 | 560 | 775 |

CONTAMINANTS

| | method | limit/base | current | history1 | history2 |
|-----------|--------|-----------------|----------|----------|----------|
| Silicon | ppm | ASTM D5185m >8 | 1 | <1 | <1 |
| Sodium | ppm | ASTM D5185m | 1 | 0 | <1 |
| Potassium | ppm | ASTM D5185m >20 | 2 | <1 | 0 |

FLUID CLEANLINESS

| | method | limit/base | current | history1 | history2 |
|-----------------|--------------|------------|-------------------|----------|----------|
| Particles >4µm | ASTM D7647 | >2500 | ▲ 6647 | 1032 | 46 |
| Particles >6µm | ASTM D7647 | >640 | ▲ 1469 | 52 | 8 |
| Particles >14µm | ASTM D7647 | >80 | ▲ 108 | 3 | 1 |
| Particles >21µm | ASTM D7647 | >20 | ▲ 22 | 1 | 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 | ▲ 20/18/14 | 17/13/9 | 13/10/7 |

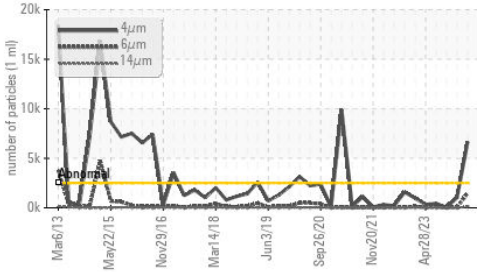
FLUID DEGRADATION

| | method | limit/base | current | history1 | history2 |
|------------------|----------|----------------|-------------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D8045 0.4 | 0.33 | 0.40 | 0.37 |

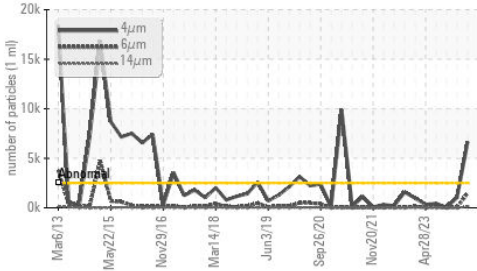


OIL ANALYSIS REPORT

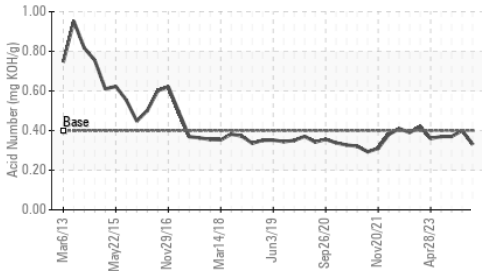
▲ Particle Trend



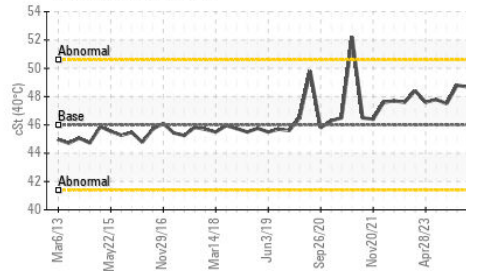
▲ Particle Trend



Acid Number



Viscosity @ 40°C



| 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 | >0.1 | NEG | NEG |
| Free Water | scalar | *Visual | | NEG | NEG |

| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 40°C | cSt | ASTM D445 | 46 | 48.68 | 48.8 |

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

Color

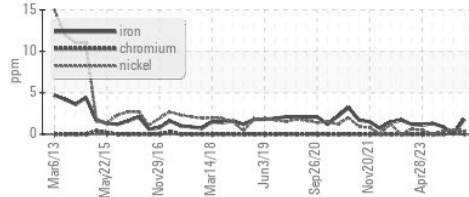


Bottom

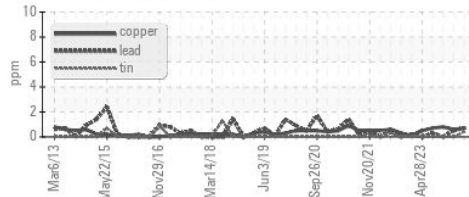


GRAPHS

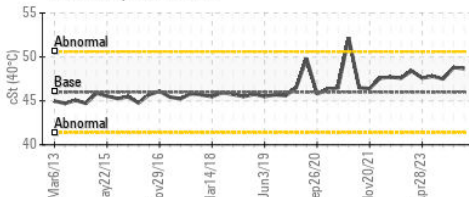
Ferrous Alloys



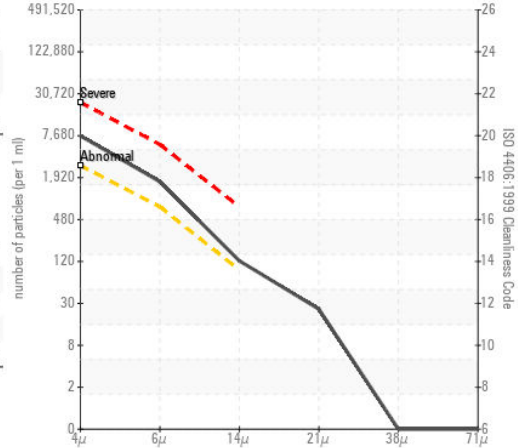
Non-ferrous Metals



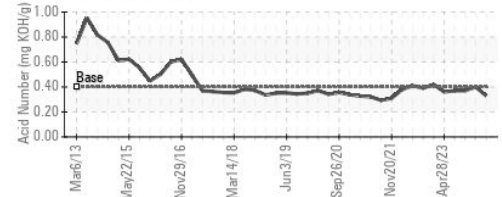
Viscosity @ 40°C



▲ Particle Count



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
 Sample No. : WC0926190
 Lab Number : 06193965
 Unique Number : 11056088
 Test Package : IND 2 (Additional Tests: PrtCount)
 Received : 29 May 2024
 Tested : 03 Jun 2024
 Diagnosed : 03 Jun 2024 - Jonathan Hester

NORTHWESTERN ENERGY
 6700 RAINBOW DAM RD
 GREAT FALLS, MT
 US 59404
 Contact: Derek Besich
 derek.besich@northwestern.com
 T: (406)268-2325
 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)