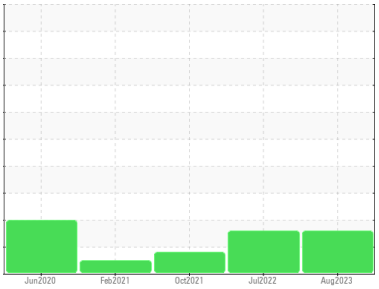
# OIL ANALYSIS REPORT

Area
**METRO**
Machine Id
**METRO 21038**
Component
**Front Differential**
Fluid
**NOT GIVEN (--- GAL)**

Sample Rating Trend




**WEAR**

## DIAGNOSIS

**Recommendation**
No corrective action is recommended at this time. Resample at the next service interval to monitor. Please note that this is a corrected copy for laboratory elemental data.

**Wear**
Gear wear is indicated.

**Contamination**
There is a high amount of silt (particulates < 6 microns in size) 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 | | **WC0843203** | WC0728442 | WC0661179 |
| Sample Date | | Client Info | | **14 Aug 2023** | 20 Jul 2022 | 04 Oct 2021 |
| Machine Age | mls | Client Info | | **356836** | 251424 | 161676 |
| Oil Age | mls | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >500 | ▲ **829** | ▲ 579 | ▲ 512 |
| Chromium | ppm | ASTM D5185m | >10 | **6** | 4 | 4 |
| Nickel | ppm | ASTM D5185m | >10 | **5** | 4 | 1 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | **6** | 2 | 3 |
| Lead | ppm | ASTM D5185m | >25 | **0** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >100 | **2** | 1 | 1 |
| Tin | ppm | ASTM D5185m | >10 | **0** | 0 | 0 |
| Antimony | ppm | ASTM D5185m | >5 | **---** | --- | 0 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **96** | 78 | 92 |
| Barium | ppm | ASTM D5185m | | **28** | 0 | 2 |
| Molybdenum | ppm | ASTM D5185m | | **2** | 1 | 1 |
| Manganese | ppm | ASTM D5185m | | **16** | 11 | 10 |
| Magnesium | ppm | ASTM D5185m | | **159** | 148 | 149 |
| Calcium | ppm | ASTM D5185m | | **4** | 7 | 9 |
| Phosphorus | ppm | ASTM D5185m | | **1680** | 1588 | 1634 |
| Zinc | ppm | ASTM D5185m | | **43** | 10 | 9 |
| Sulfur | ppm | ASTM D5185m | | **25056** | 25056 | 21058 |

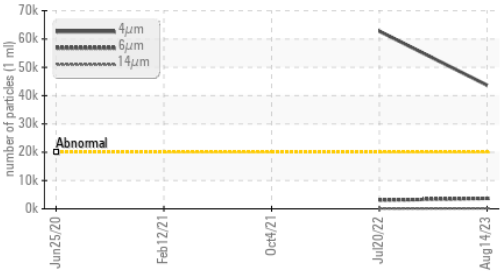
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >75 | **57** | 46 | 42 |
| Sodium | ppm | ASTM D5185m | | **16** | 13 | 11 |
| Potassium | ppm | ASTM D5185m | >20 | **3** | 2 | 0 |
| Water | % | ASTM D6304 | >.2 | **0.075** | 0.052 | 0.037 |
| ppm Water | ppm | ASTM D6304 | >2000 | **751.3** | 529.8 | 376.1 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >20000 | ▲ **43676** | ▲ 62756 | --- |
| Particles >6µm | | ASTM D7647 | >5000 | **3686** | 3029 | --- |
| Particles >14µm | | ASTM D7647 | >640 | **167** | 94 | --- |
| Particles >21µm | | ASTM D7647 | >160 | **46** | 9 | --- |
| Particles >38µm | | ASTM D7647 | >40 | **2** | 1 | --- |
| Particles >71µm | | ASTM D7647 | >10 | **0** | 0 | --- |
| Oil Cleanliness | | ISO 4406 (c) | >21/19/16 | ▲ **23/19/15** | ▲ 23/19/14 | --- |

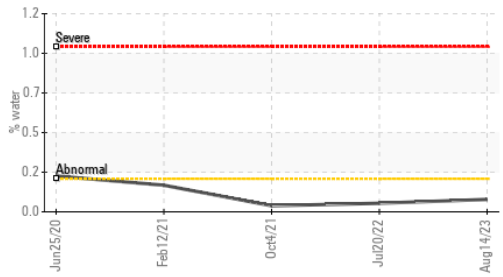
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | **1.46** | 1.33 | 1.58 |

# OIL ANALYSIS REPORT

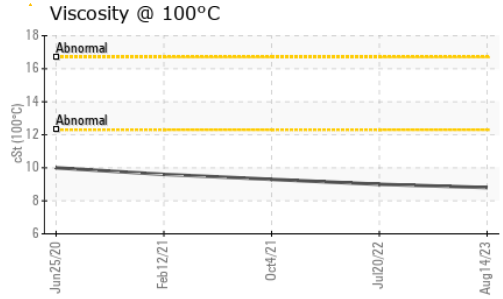
Particle Trend



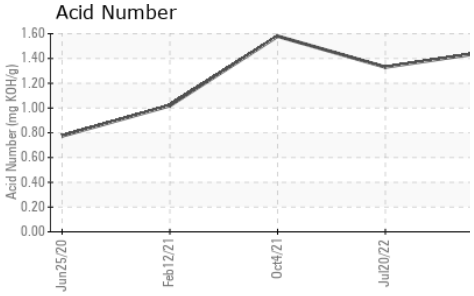

Water



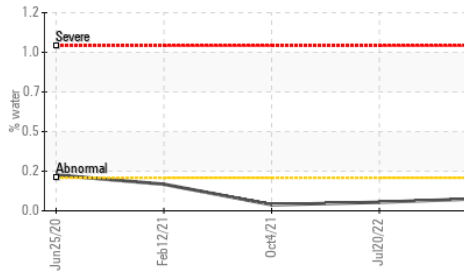

Viscosity @ 100°C




Acid Number

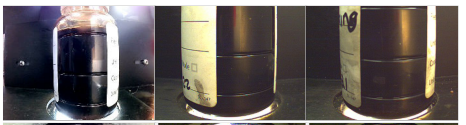
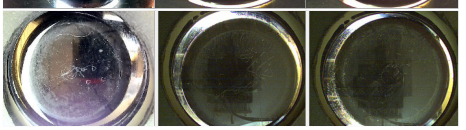



Water



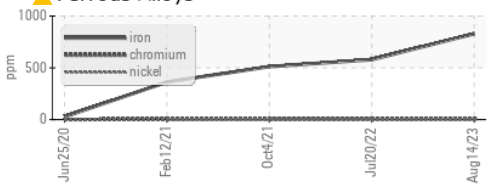

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Debris | scalar | *Visual | NONE | **NONE** | NONE | VLITE |
| 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 | >.2 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | | **47.6** | 48.4 | 49.6 |
| Visc @ 100°C | cSt | ASTM D445 | | **8.8** | 9 | 9.3 |
| Viscosity Index (VI) | Scale | ASTM D2270 | | **166** | 169 | 173 |

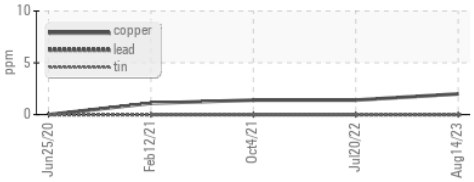
| SAMPLE IMAGES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Color | | | |  | | |
| Bottom | | | |  | | |

## GRAPHS

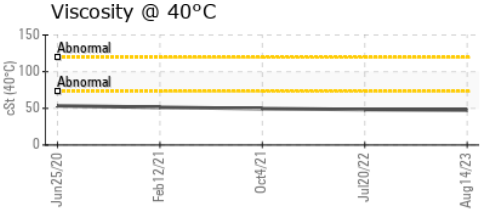
Ferrous Alloys



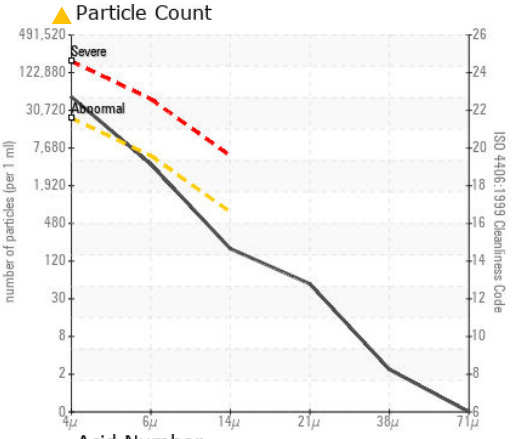

Non-ferrous Metals



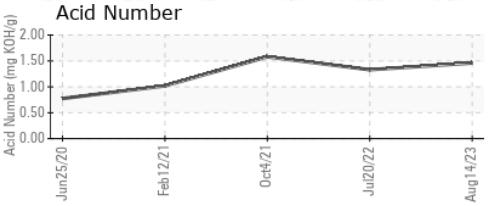

Viscosity @ 40°C




Particle Count




Acid Number




**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0843203 **Received** : 28 Aug 2023
**Lab Number** : 05936664 **Diagnosed** : 31 Aug 2023
**Unique Number** : 10621935 **Diagnostician** : Doug Bogart
**Test Package** : MOB 2 ( Additional Tests: KF, KV100, PrtCount, VI )

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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