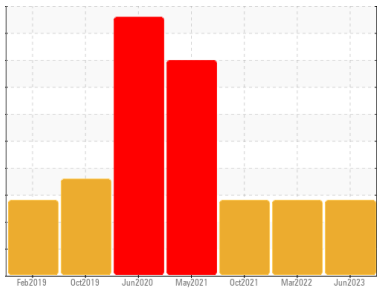
# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Area
**METRO**
Machine Id
**METRO 20003**
Component
**Transmission (Manual)**
Fluid
**NOT GIVEN (--- GAL)**

## DIAGNOSIS

**Recommendation**
No corrective action is recommended at this time. Resample at the next service interval to monitor.

**Wear**
The aluminum level is abnormal. The tin level is abnormal.

**Contamination**
There is a high amount of silt (particulates < 14 microns in size) present in the fluid.

**Fluid Condition**
The AN level is acceptable for this fluid. The condition of the fluid is suitable for further service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0828731** | WC0682391 | WC0631755 |
| Sample Date | | Client Info | | **22 Jun 2023** | 24 Mar 2022 | 20 Oct 2021 |
| Machine Age | mls | Client Info | | **432638** | 333028 | 286884 |
| 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 | >200 | **196** | 151 | 108 |
| Chromium | ppm | ASTM D5185m | >5 | **1** | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | **<1** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >7 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | ▲ **274** | ▲ 218 | ▲ 179 |
| Lead | ppm | ASTM D5185m | >45 | **<1** | <1 | <1 |
| Copper | ppm | ASTM D5185m | >225 | **22** | 18 | 15 |
| Tin | ppm | ASTM D5185m | >10 | ▲ **33** | ▲ 27 | ▲ 23 |
| Antimony | ppm | ASTM D5185m | | **---** | --- | 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 | | **312** | 306 | 266 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Manganese | ppm | ASTM D5185m | | **4** | 4 | 3 |
| Magnesium | ppm | ASTM D5185m | | **3** | 3 | 2 |
| Calcium | ppm | ASTM D5185m | | **51** | 55 | 49 |
| Phosphorus | ppm | ASTM D5185m | | **1128** | 1216 | 1043 |
| Zinc | ppm | ASTM D5185m | | **12** | 9 | 7 |
| Sulfur | ppm | ASTM D5185m | | **1328** | 1178 | 1207 |

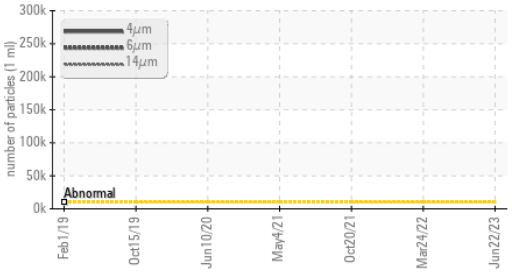
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >125 | **20** | 19 | 14 |
| Sodium | ppm | ASTM D5185m | | **0** | 1 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **8** | 8 | 5 |
| Water | % | ASTM D6304 | >0.1 | **0.061** | 0.042 | 0.075 |
| ppm Water | ppm | ASTM D6304 | >1000 | **612.2** | 423.6 | 754.1 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >10000 | ▲ **265930** | --- | --- |
| Particles >6µm | | ASTM D7647 | >2500 | ▲ **119727** | --- | --- |
| Particles >14µm | | ASTM D7647 | >320 | **148** | --- | --- |
| Particles >21µm | | ASTM D7647 | >80 | **20** | --- | --- |
| Particles >38µm | | ASTM D7647 | >20 | **0** | --- | --- |
| Particles >71µm | | ASTM D7647 | >4 | **0** | --- | --- |
| Oil Cleanliness | | ISO 4406 (c) | >20/18/15 | ▲ **25/24/14** | --- | --- |

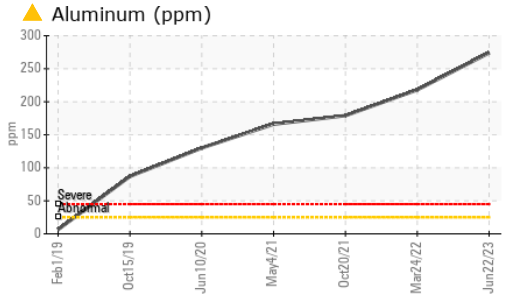
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | **3.81** | ▲ 3.940 | ▲ 3.685 |

# OIL ANALYSIS REPORT

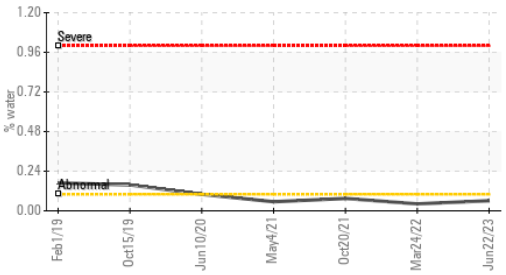
Particle Trend



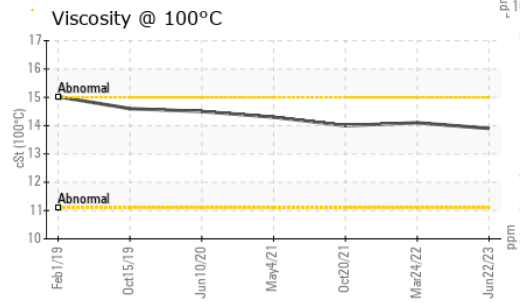

Aluminum (ppm)



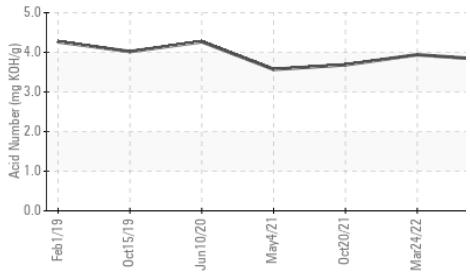

Water




Viscosity @ 100°C

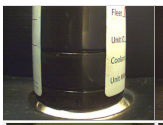
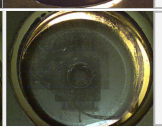



Acid Number



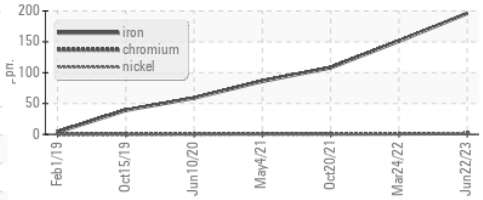

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Debris | scalar | *Visual | NONE | **NONE** | NONE | 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 | >0.1 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | | **92.5** | 90.5 | 91.2 |
| Visc @ 100°C | cSt | ASTM D445 | | **13.9** | 14.1 | 14.0 |
| Viscosity Index (VI) | Scale | ASTM D2270 | | **153** | 160 | 157 |

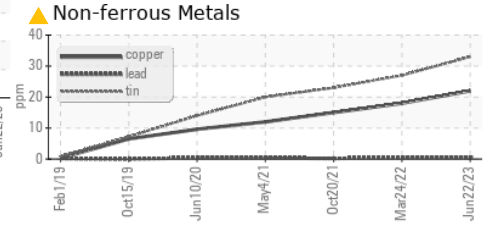
| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | |  |  | *no image* |
| Bottom | | |  |  | *no image* |

GRAPHS

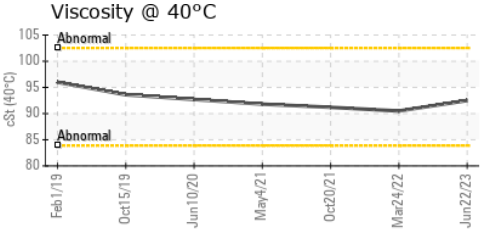
Ferrous Alloys



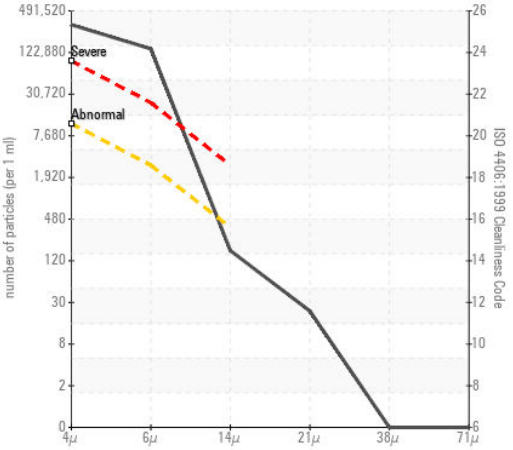

Non-ferrous Metals



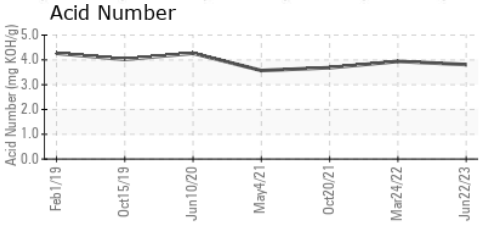

Viscosity @ 40°C




Particle Count




Acid Number




Certificate L2367

| | | | |
|---|---|---|---|
| **Laboratory** | : WearCheck USA - 501 Madison Ave., Cary, NC 27513 | | |
| **Sample No.** | : WC0828731 | **Received** | : 19 Jul 2023 |
| **Lab Number** | : 05902276 | **Diagnosed** | : 21 Jul 2023 |
| **Unique Number** | : 10563632 | **Diagnostician** | : Jonathan Hester |
| **Test Package** | : MOB 2 ( Additional Tests: KF, KV100, PrtCount, VI ) | | |

*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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