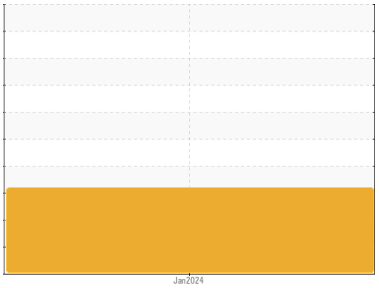
# OIL ANALYSIS REPORT

Sample Rating Trend




**DEGRADATION**

Machine Id
## MK HPU
Component
### Hydraulic System
Fluid
### SHELL NATURELLE S2 HYDRAULIC FLUID 46 (--- GAL)

## DIAGNOSIS

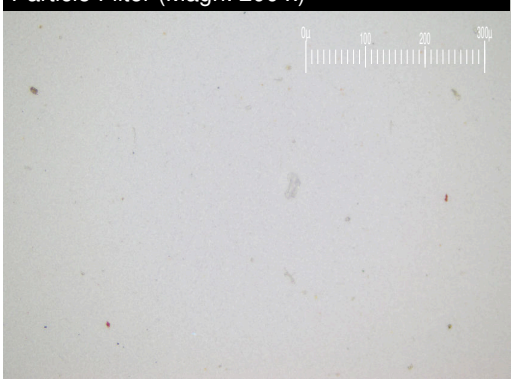
**Recommendation**
The oil is near the end of it`s useful service life, recommend schedule an oil change. We recommend an early resample to monitor this condition.

**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 at the top-end of the recommended limit.

Particle Filter (Magn: 200 x)



| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **PH0001872** | --- | --- |
| Sample Date | | Client Info | | **05 Jan 2024** | --- | --- |
| Machine Age | hrs | Client Info | | **0** | --- | --- |
| Oil Age | hrs | Client Info | | **0** | --- | --- |
| Oil Changed | | Client Info | | **N/A** | --- | --- |
| Sample Status | | | | **ABNORMAL** | --- | --- |

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

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >20 | **14** | --- | --- |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | --- | --- |
| Nickel | ppm | ASTM D5185m | >20 | **<1** | --- | --- |
| Titanium | ppm | ASTM D5185m | | **<1** | --- | --- |
| Silver | ppm | ASTM D5185m | | **0** | --- | --- |
| Aluminum | ppm | ASTM D5185m | >20 | **2** | --- | --- |
| Lead | ppm | ASTM D5185m | >20 | **<1** | --- | --- |
| Copper | ppm | ASTM D5185m | >20 | **4** | --- | --- |
| Tin | ppm | ASTM D5185m | >20 | **<1** | --- | --- |
| Vanadium | ppm | ASTM D5185m | | **0** | --- | --- |
| Cadmium | ppm | ASTM D5185m | | **<1** | --- | --- |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **2** | --- | --- |
| Barium | ppm | ASTM D5185m | | **0** | --- | --- |
| Molybdenum | ppm | ASTM D5185m | | **<1** | --- | --- |
| Manganese | ppm | ASTM D5185m | | **0** | --- | --- |
| Magnesium | ppm | ASTM D5185m | | **<1** | --- | --- |
| Calcium | ppm | ASTM D5185m | | **5** | --- | --- |
| Phosphorus | ppm | ASTM D5185m | | **211** | --- | --- |
| Zinc | ppm | ASTM D5185m | | **0** | --- | --- |
| Sulfur | ppm | ASTM D5185m | | **2016** | --- | --- |

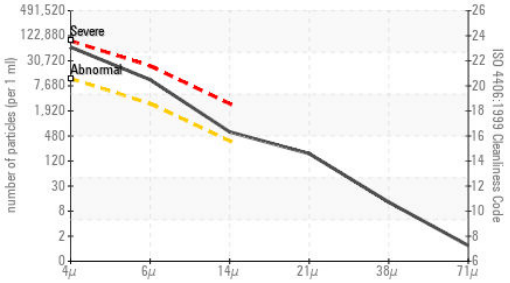
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >15 | **<1** | --- | --- |
| Sodium | ppm | ASTM D5185m | | **11** | --- | --- |
| Potassium | ppm | ASTM D5185m | >20 | **2** | --- | --- |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >10000 | ▲ **56687** | --- | --- |
| Particles >6µm | | ASTM D7647 | >2500 | ▲ **9388** | --- | --- |
| Particles >14µm | | ASTM D7647 | >320 | ▲ **528** | --- | --- |
| Particles >21µm | | ASTM D7647 | >80 | ▲ **159** | --- | --- |
| Particles >38µm | | ASTM D7647 | >20 | **11** | --- | --- |
| Particles >71µm | | ASTM D7647 | >4 | **1** | --- | --- |
| Oil Cleanliness | | ISO 4406 (c) | >20/18/15 | ▲ **23/20/16** | --- | --- |

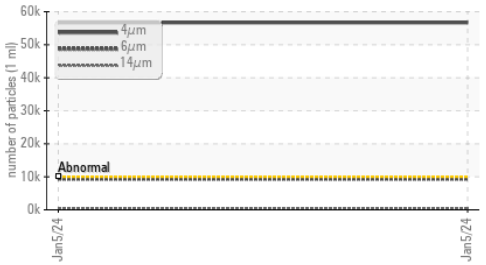
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | ▲ **3.44** | --- | --- |

# OIL ANALYSIS REPORT

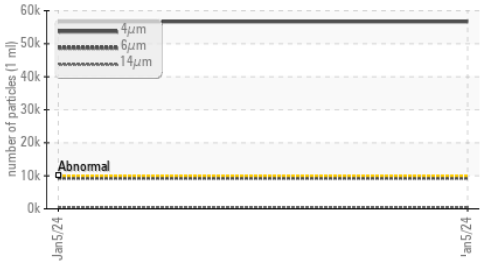
Particle Count




Particle Trend



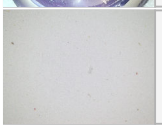

Particle Trend




Viscosity @ 40°C

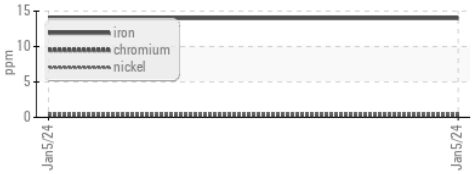

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | --- | --- |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | --- | --- |
| Precipitate | scalar | *Visual | NONE | **NONE** | --- | --- |
| Silt | scalar | *Visual | NONE | **NONE** | --- | --- |
| Debris | scalar | *Visual | NONE | **LIGHT** | --- | --- |
| Sand/Dirt | scalar | *Visual | NONE | **NONE** | --- | --- |
| Appearance | scalar | *Visual | NORML | **NORML** | --- | --- |
| Odor | scalar | *Visual | NORML | **NORML** | --- | --- |
| Emulsified Water | scalar | *Visual | >0.05 | **NEG** | --- | --- |
| Free Water | scalar | *Visual | | **NEG** | --- | --- |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | 47.2 | **48.2** | --- | --- |

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

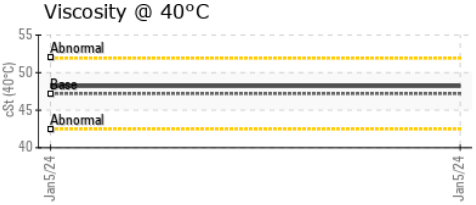
GRAPHS

Ferrous Alloys

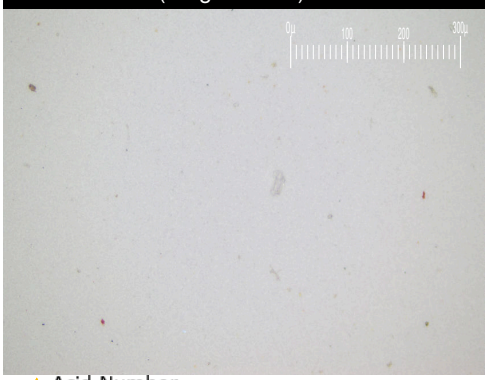



Non-ferrous Metals

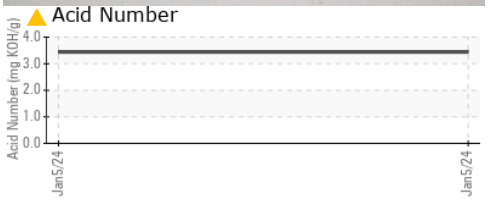

Viscosity @ 40°C




Particle Filter (Magn: 200 x)



Acid Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : PH0001872 **Received** : 11 Jan 2024
**Lab Number** : 06058727 **Tested** : 15 Jan 2024
**Unique Number** : 10830109 **Diagnosed** : 15 Jan 2024 - Jonathan Hester
**Test Package** : PLANT ( Additional Tests: PrtFilter )

*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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