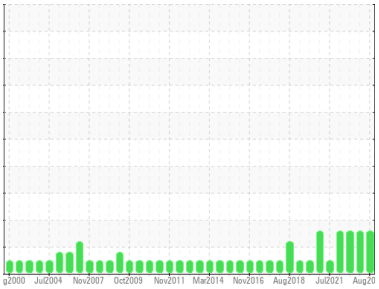
# PROBLEM SUMMARY

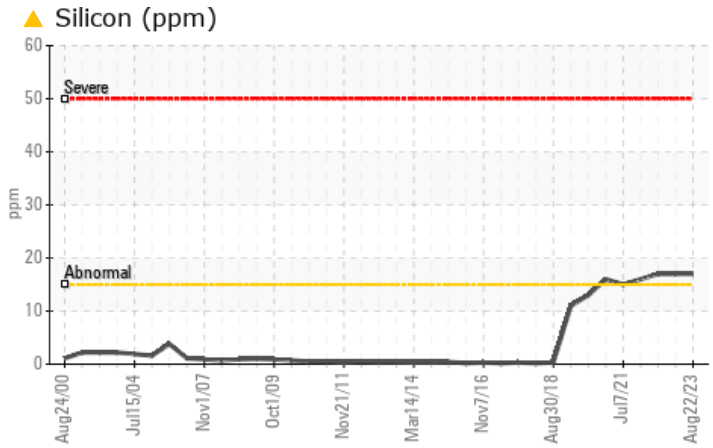
Area
**WQR**
Machine Id
**CATHHPU8 (S/N UJ918A-8)**
Component
**Hydraulic System**
Fluid
**ESSO NUTO H ISO 46 (160 LTR)**

**Sample Rating Trend**



**DIRT**

## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend an early resample to monitor this condition.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >15 | ▲ **17** | ▲ 17 | ▲ 17 |

**Customer Id:** ALGMIS
**Sample No.:** WC0779200
**Lab Number:** 02579119
**Test Package:** IND 2

*To manage this report scan the QR code*

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Kevin.Marson@wearcheck.com

*To change component or sample information:*
Gloria Gonzalez +1 (289)291-4643 x4643
gloria.gonzalez@wearcheck.com

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |
| Check Breathers | --- | --- | ? | The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. |
| Check Seals | --- | --- | ? | Check seals and/or filters for points of contaminant entry. |

## HISTORICAL DIAGNOSIS

**08 Feb 2023 Diag: Kevin Marson**

DIRT

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend an early resample to monitor this condition.All component wear rates are normal. Elemental level of silicon (Si) above normal indicating ingress of seal material. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report

**03 Aug 2022 Diag: Kevin Marson**

DIRT

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend an early resample to monitor this condition.All component wear rates are normal. Elemental level of silicon (Si) above normal indicating ingress of seal material. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report

**14 Feb 2022 Diag: Kevin Marson**

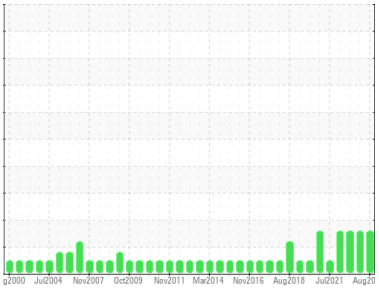
DIRT

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend an early resample to monitor this condition.All component wear rates are normal. Elemental level of silicon (Si) above normal indicating ingress of seal material. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report

# OIL ANALYSIS REPORT

Sample Rating Trend



**DIRT**

Area
**WQR**
Machine Id
## CATHHPU8 (S/N UJ918A-8)
Component
**Hydraulic System**
Fluid
**ESSO NUTO H ISO 46 (160 LTR)**

## DIAGNOSIS

**Recommendation**

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend an early resample to monitor this condition.

**Wear**

All component wear rates are normal.

**Contamination**

Elemental level of silicon (Si) above normal indicating ingress of seal material.

**Fluid Condition**

The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0779200** | WC0779192 | WC0548075 |
| Sample Date | | Client Info | | **22 Aug 2023** | 08 Feb 2023 | 03 Aug 2022 |
| Machine Age | hrs | Client Info | | **130445** | 125878 | 121701 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | N/A |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185(m) | >20 | **<1** | <1 | <1 |
| Chromium | ppm | ASTM D5185(m) | >20 | **0** | 0 | 0 |
| Nickel | ppm | ASTM D5185(m) | >20 | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |
| Silver | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185(m) | >20 | **<1** | 0 | 0 |
| Lead | ppm | ASTM D5185(m) | >20 | **0** | 0 | 4 |
| Copper | ppm | ASTM D5185(m) | >20 | **3** | 3 | 3 |
| Tin | ppm | ASTM D5185(m) | >20 | **0** | 0 | 0 |
| Antimony | ppm | ASTM D5185(m) | | **0** | <1 | 0 |
| Vanadium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Beryllium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Barium | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Manganese | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Magnesium | ppm | ASTM D5185(m) | 5 | **<1** | 0 | <1 |
| Calcium | ppm | ASTM D5185(m) | 50 | **94** | 97 | 95 |
| Phosphorus | ppm | ASTM D5185(m) | 330 | **706** | 706 | 649 |
| Zinc | ppm | ASTM D5185(m) | 410 | **877** | 878 | 883 |
| Sulfur | ppm | ASTM D5185(m) | 2700 | **3942** | 3993 | 4033 |
| Lithium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |

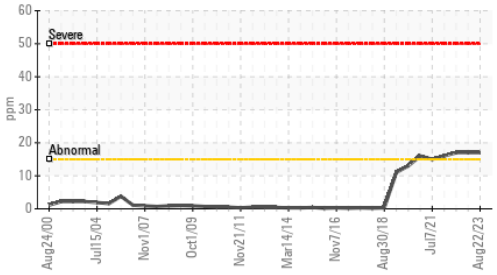
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >15 | ▲ **17** | ▲ 17 | ▲ 17 |
| Sodium | ppm | ASTM D5185(m) | | **2** | 2 | 2 |
| Potassium | ppm | ASTM D5185(m) | >20 | **0** | <1 | <1 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >5000 | **163** | 465 | 284 |
| Particles >6µm | | ASTM D7647 | >1300 | **50** | 116 | 72 |
| Particles >14µm | | ASTM D7647 | >160 | **6** | 15 | 10 |
| Particles >21µm | | ASTM D7647 | >40 | **1** | 4 | 4 |
| Particles >38µm | | ASTM D7647 | >10 | **0** | 0 | 1 |
| Particles >71µm | | ASTM D7647 | >3 | **0** | 0 | 1 |
| Oil Cleanliness | | ISO 4406 (c) | >19/17/14 | **15/13/10** | 16/14/11 | 15/13/10 |

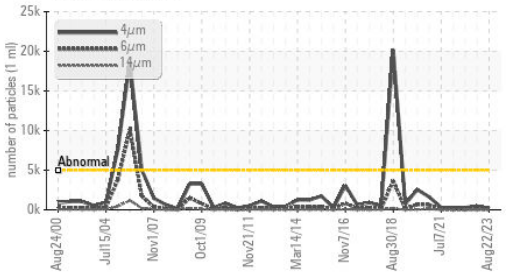
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 0.45 | **0.84** | 0.80 | 0.95 |

# OIL ANALYSIS REPORT

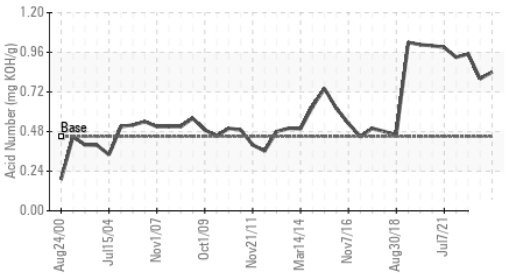
Silicon (ppm)



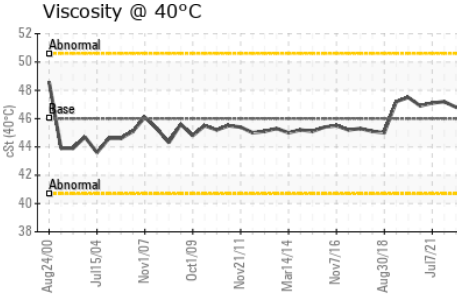

Particle Trend



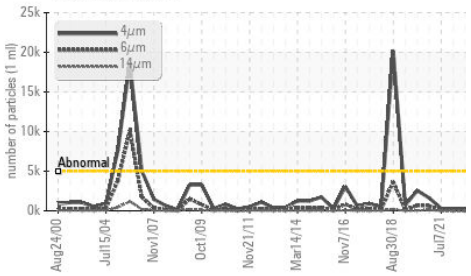

Acid Number




Viscosity @ 40°C

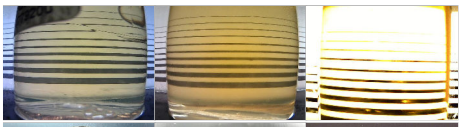



Particle Trend



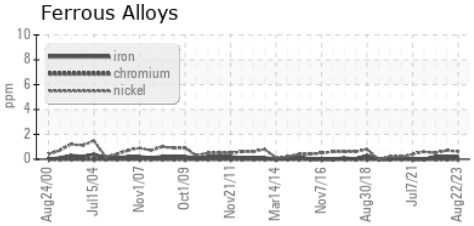

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | Visual* | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | Visual* | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | Visual* | NONE | **NONE** | NONE | NONE |
| 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* | >0.05 | **NEG** | NEG | NEG |
| Free Water | scalar | Visual* | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D7279(m) | 46 | **46.8** | 47.0 | 46.8 |

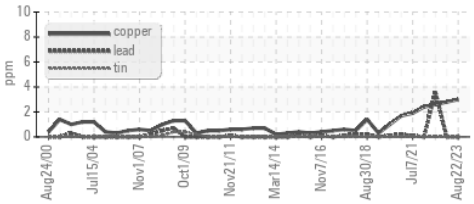
| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | |  | | |
| Bottom | | |  | | |

## GRAPHS

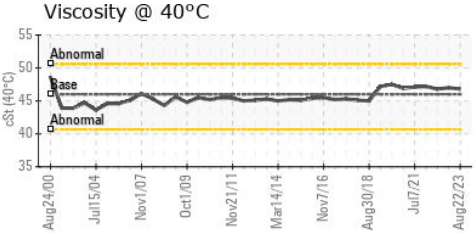
Ferrous Alloys



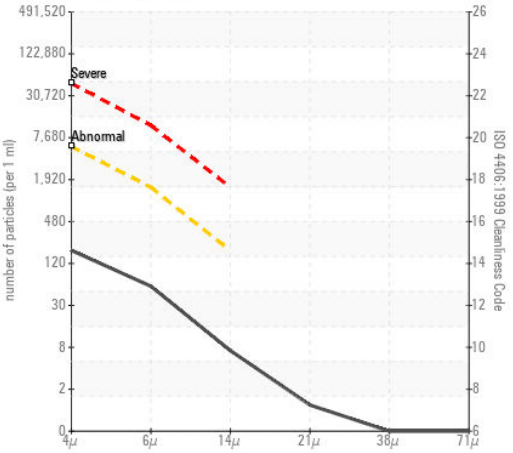

Non-ferrous Metals



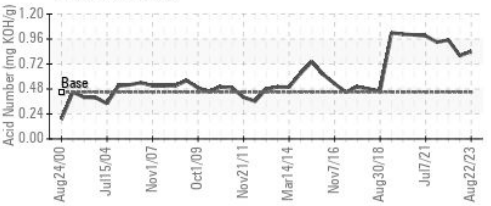

Viscosity @ 40°C




Particle Count




Acid Number




ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 **ALGONQUIN POWER SYSTEMS INC.**
**Sample No.** : WC0779200 **Received** : 29 Aug 2023 354 DAVIS ROAD
**Lab Number** : 02579119 **Diagnosed** : 30 Aug 2023 OAKVILLE, ON
**Unique Number** : 5632179 **Diagnostician** : Kevin Marson CA L6J 2X1
**Test Package** : IND 2 Contact: Antonino Champ Fernando

*To discuss this sample report, contact Customer Service at 1-800-268-2131.* antoninoChamp.fernando@algonquinpower.com
*Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.* T: (905)465-7065
*Validity of results and interpretation are based on the sample and information as supplied.* F: x: