



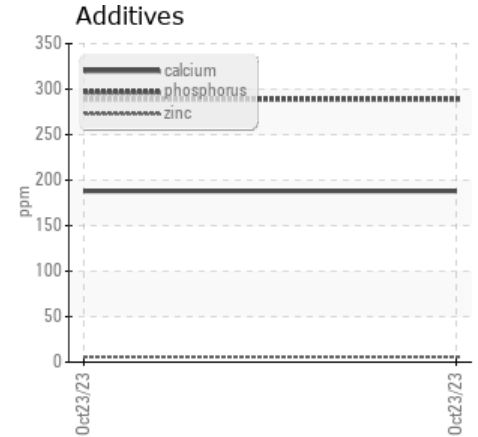
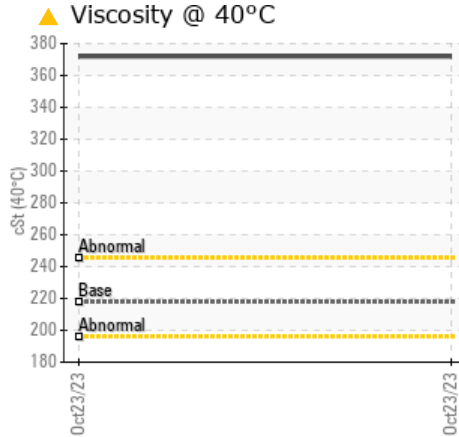
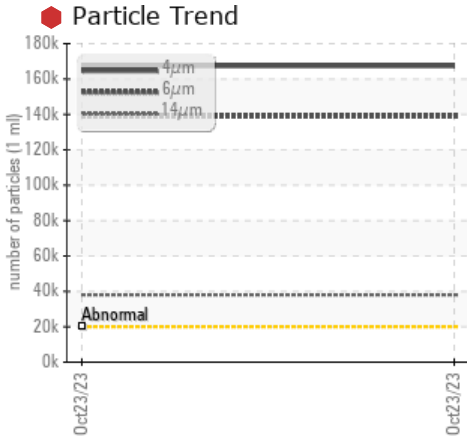
Machine Id
MICRO TUNNELLING

Component
Gearbox

Fluid
MOBIL SHC 630 (20 LTR)



COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. 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. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation.

PROBLEMATIC TEST RESULTS

Sample Status				SEVERE	---	---
Particles >4µm	ASTM D7647	>20000	🔴	167400	---	---
Particles >6µm	ASTM D7647	>5000	🔴	138899	---	---
Particles >14µm	ASTM D7647	>640	🔴	38019	---	---
Particles >21µm	ASTM D7647	>160	🔴	7839	---	---
Particles >38µm	ASTM D7647	>40	🟡	176	---	---
Oil Cleanliness	ISO 4406 (c)	>21/19/16	🔴	25/24/22	---	---
Visc @ 40°C	cSt ASTM D7279(m)	217.7	🟡	372	---	---

Customer Id: CUMNEW
Sample No.: ST43097
Lab Number: 02591840
Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
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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
Change Filter	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.
Resample	---	---	?	Resample in 30-45 days to monitor this situation.
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 Dirt Access	---	---	?	We advise that you check all areas where contaminants can enter the system.
Check Fluid Source	---	---	?	Confirm the source of the lubricant being utilized for top-up/fill.
Filter Fluid	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.

HISTORICAL DIAGNOSIS



Machine Id
MICRO TUNNELLING

Component
Gearbox
Fluid
MOBIL SHC 630 (20 LTR)



DIAGNOSIS

Recommendation

We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. 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. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation.

Wear

All component wear rates are normal.

Contamination

There is a high amount of particulates (2 to 100 microns in size) present in the oil. The water content is negligible.

Fluid Condition

Viscosity of sample indicates oil is within SAE 140 range, advise investigate. This plus the additive levels indicates that this is not the same brand, or type of oil as reported. 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		ST43097	---	---
Sample Date	Client Info		23 Oct 2023	---	---
Machine Age	yrs	Client Info	0	---	---
Oil Age	yrs	Client Info	1	---	---
Oil Changed	Client Info		N/A	---	---
Sample Status			SEVERE	---	---

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>200	165	---
Chromium	ppm	ASTM D5185(m)	>15	3	---
Nickel	ppm	ASTM D5185(m)	>15	<1	---
Titanium	ppm	ASTM D5185(m)		0	---
Silver	ppm	ASTM D5185(m)		<1	---
Aluminum	ppm	ASTM D5185(m)	>25	3	---
Lead	ppm	ASTM D5185(m)	>100	0	---
Copper	ppm	ASTM D5185(m)	>200	4	---
Tin	ppm	ASTM D5185(m)	>25	0	---
Antimony	ppm	ASTM D5185(m)	>5	<1	---
Vanadium	ppm	ASTM D5185(m)		0	---
Beryllium	ppm	ASTM D5185(m)		0	---
Cadmium	ppm	ASTM D5185(m)		0	---

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)		2	---
Barium	ppm	ASTM D5185(m)		<1	---
Molybdenum	ppm	ASTM D5185(m)		<1	---
Manganese	ppm	ASTM D5185(m)		<1	---
Magnesium	ppm	ASTM D5185(m)		3	---
Calcium	ppm	ASTM D5185(m)		188	---
Phosphorus	ppm	ASTM D5185(m)		289	---
Zinc	ppm	ASTM D5185(m)		6	---
Sulfur	ppm	ASTM D5185(m)		1884	---
Lithium	ppm	ASTM D5185(m)		2	---

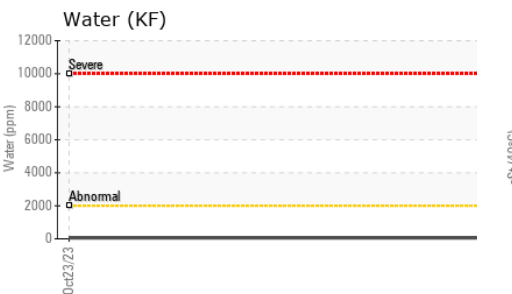
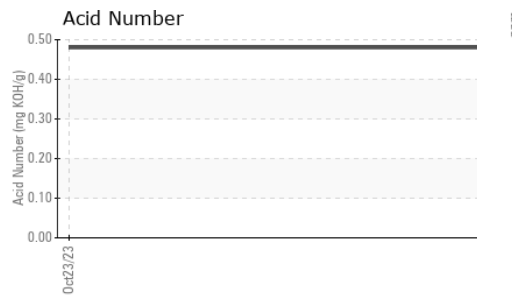
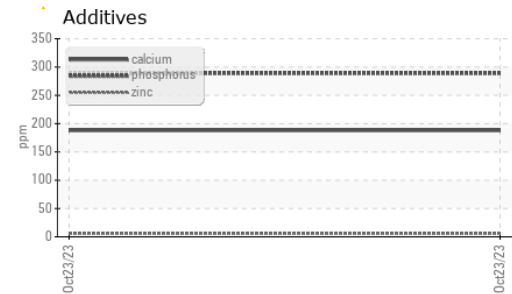
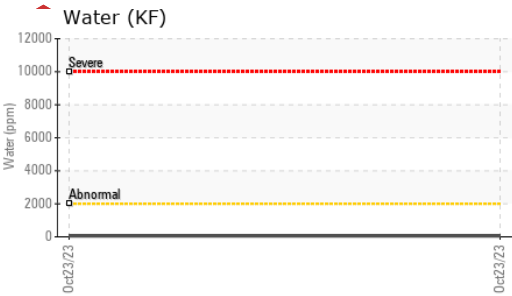
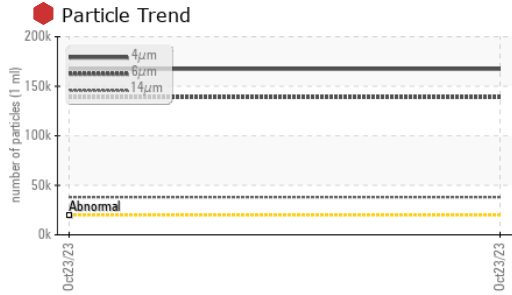
CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>50	19	---
Sodium	ppm	ASTM D5185(m)		1	---
Potassium	ppm	ASTM D5185(m)	>20	0	---
Water	%	ASTM D6304*	>0.2	0.005	---
ppm Water	ppm	ASTM D6304*	>2000	55.3	---

FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>20000	167400	---	---
Particles >6µm	ASTM D7647	>5000	138899	---	---
Particles >14µm	ASTM D7647	>640	38019	---	---
Particles >21µm	ASTM D7647	>160	7839	---	---
Particles >38µm	ASTM D7647	>40	176	---	---
Particles >71µm	ASTM D7647	>10	6	---	---
Oil Cleanliness	ISO 4406 (c)	>21/19/16	25/24/22	---	---

OIL ANALYSIS REPORT



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*		0.48	---	---

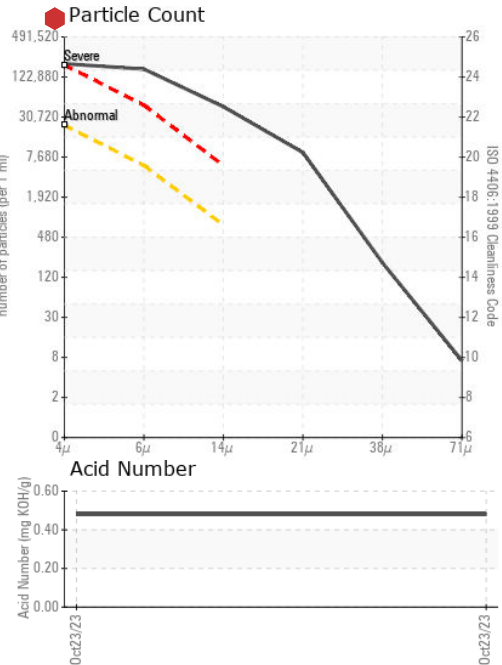
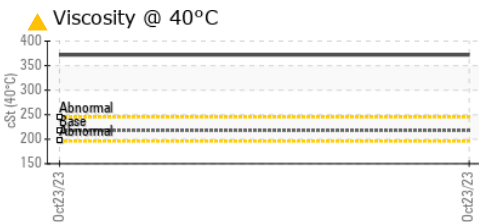
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE	---	---
Yellow Metal	scalar	Visual*	NONE	NONE	---	---
Precipitate	scalar	Visual*	NONE	NONE	---	---
Silt	scalar	Visual*	NONE	NONE	---	---
Debris	scalar	Visual*	NONE	VLITE	---	---
Sand/Dirt	scalar	Visual*	NONE	NONE	---	---
Appearance	scalar	Visual*	NORML	NORML	---	---
Odor	scalar	Visual*	NORML	NORML	---	---
Emulsified Water	scalar	Visual*	>0.2	.2%	---	---
Free Water	scalar	Visual*		NEG	---	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	217.7	▲ 372	---	---

SAMPLE IMAGES

method	limit/base	current	history1	history2
Color			no image	no image
Bottom			no image	no image

GRAPHS



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : ST43097 **Received** : 25 Oct 2023
Lab Number : **02591840** **Diagnosed** : 27 Oct 2023
Unique Number : 5668919 **Diagnostician** : Kevin Marson
Test Package : IND 2 (Additional Tests: KF, PrtCount, TAN Man)

Cummins Hydraulics Ltd
 1250 Gorham Street
 Newmarket, ON
 CA L3Y 8W4
 Contact: Glen Van Valkenburg

To discuss this sample report, contact Customer Service at 1-800-268-2131.
 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
 Validity of results and interpretation are based on the sample and information as supplied.

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