OIL ANALYSIS REPORT

Sample Rating Trend

WEAR PARTICLES

Area
[185832-N2STV4W]
Machine Id
TEST RIG
Component
Transmission (Manual)
Fluid
J20C (--- LTR)

DIAGNOSIS

Recommendation

We recommend you service the filters on this component. Resample at the next service interval to monitor. Analytical Ferrography: Results suggest the primary cause of elevated particle count is due to dirt/contamination. The particulate is in general far too large to show in the metals analysis. The next most common particle is a black debris - this debris does not appear to be a polymer, but is more likely a thermally degraded abrasive contaminant. If this test stand is primarily run on brand new components, I would suspect there is a part or parts that are not as clean as they need to be when they are assembled, possibly going back to the machining or casting process. There are notable amounts of ferrous rubbing wear and other various wear components, but with these being new units they are likely from asperities initially sloughing off rather than actual wear - it is worth noting, however, that the abrasive debris in this lubricant is easily capable of producing significant amounts of wear in a short time period and the lubricant should be circulated and cleaned/filtered thoroughly prior to introduction into any additional transmissions. If lubricant replacement is performed rather than cleaning, I would still recommend circulation and filtration because of the excessive contamination load and likelihood of residual debris after drain and refill. Aside from abrasive and black debris, there is a small amount of aluminum alloy wear, and a small amount of fibers (fibers do not appear to be from an internal component such as a clutch pack). Please note this report is a corrected copy in order to add analytical ferrography reporting.

Wear

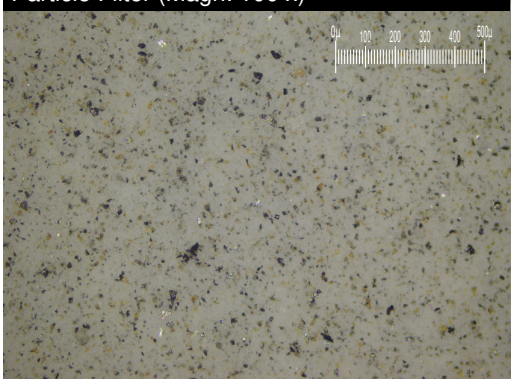
All component wear rates are normal.

Contaminants

There is a high amount of particulates present in the fluid.

Oil Condition

Particle Filter (Magn: 100 x)



SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**PH06176075**	---	---
Sample Date		Client Info		**08 May 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	>0.1	**NEG**	---	---

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>200	**6**	---	---
Chromium	ppm	ASTM D5185m	>5	**0**	---	---
Nickel	ppm	ASTM D5185m	>5	**0**	---	---
Titanium	ppm	ASTM D5185m		**0**	---	---
Silver	ppm	ASTM D5185m	>7	**0**	---	---
Aluminum	ppm	ASTM D5185m	>25	**1**	---	---
Lead	ppm	ASTM D5185m	>45	**<1**	---	---
Copper	ppm	ASTM D5185m	>225	**0**	---	---
Tin	ppm	ASTM D5185m	>10	**0**	---	---
Vanadium	ppm	ASTM D5185m		**0**	---	---
Cadmium	ppm	ASTM D5185m		**0**	---	---

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**104**	---	---
Barium	ppm	ASTM D5185m		**2**	---	---
Molybdenum	ppm	ASTM D5185m		**5**	---	---
Manganese	ppm	ASTM D5185m		**<1**	---	---
Magnesium	ppm	ASTM D5185m		**32**	---	---
Calcium	ppm	ASTM D5185m		**3099**	---	---
Phosphorus	ppm	ASTM D5185m		**1041**	---	---
Zinc	ppm	ASTM D5185m		**1270**	---	---
Sulfur	ppm	ASTM D5185m		**3359**	---	---

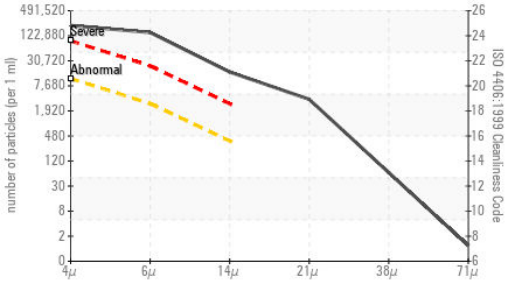
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>125	**6**	---	---
Sodium	ppm	ASTM D5185m		**1**	---	---
Potassium	ppm	ASTM D5185m	>20	**2**	---	---

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>10000	▲ **186872**	---	---
Particles >6µm		ASTM D7647	>2500	▲ **126904**	---	---
Particles >14µm		ASTM D7647	>320	▲ **14357**	---	---
Particles >21µm		ASTM D7647	>80	▲ **3183**	---	---
Particles >38µm		ASTM D7647	>20	▲ **56**	---	---
Particles >71µm		ASTM D7647	>4	**1**	---	---
Oil Cleanliness		ISO 4406 (c)	>20/18/15	▲ **25/24/21**	---	---

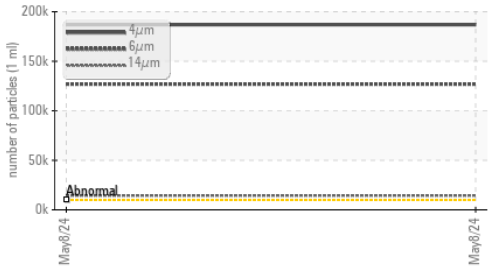
FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		**1.23**	---	---

OIL ANALYSIS REPORT

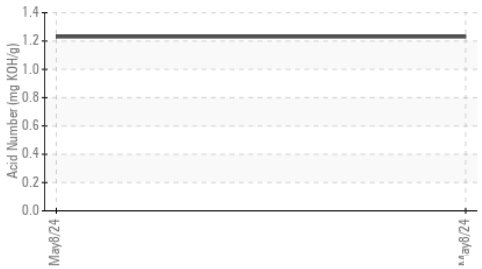
Particle Count



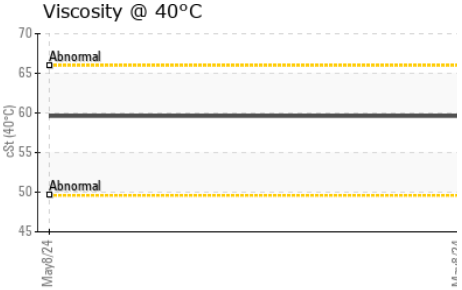
Particle Trend



Acid Number



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	**NONE**	---	---
Sand/Dirt	scalar	*Visual	NONE	**NONE**	---	---
Appearance	scalar	*Visual	NORML	**NORML**	---	---
Odor	scalar	*Visual	NORML	**NORML**	---	---
Emulsified Water	scalar	*Visual	>0.1	**NEG**	---	---
Free Water	scalar	*Visual		**NEG**	---	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445		**59.6**	---	---

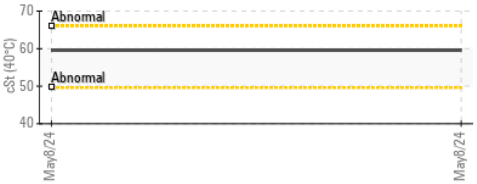
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color				*no image*	*no image*
Bottom				*no image*	*no image*
PrtFilter				*no image*	*no image*

GRAPHS

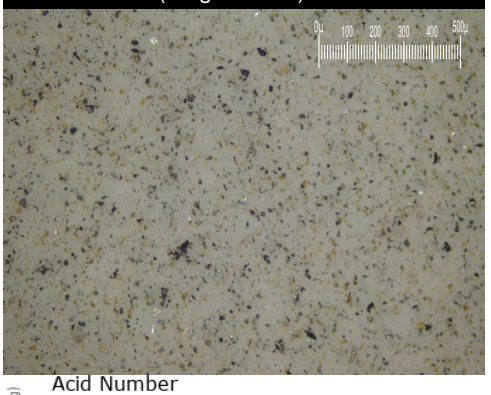
Ferrous Alloys

Non-ferrous Metals

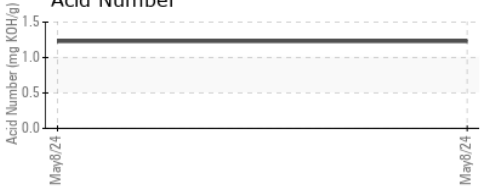
Viscosity @ 40°C



Particle Filter (Magn: 100 x)



Acid Number



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PH06176075
Lab Number : 06176075
Unique Number : 11022128
Test Package : PLANT (Additional Tests: A-FERR, PrtFilter)

Received : 10 May 2024
Tested : 17 May 2024
Diagnosed : 17 May 2024 - Aaron Black

Certificate L2367

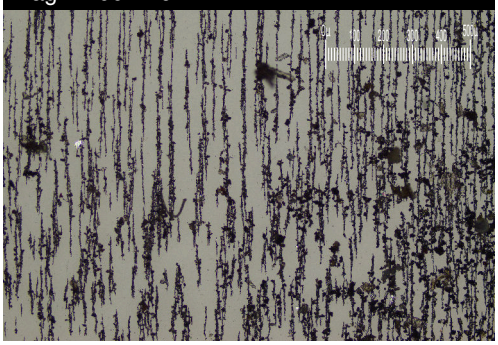
To discuss this sample report, contact Customer Service at 1-800-237-1369.
** - Denotes test methods that are outside of the ISO 17025 scope of accreditation.*
Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

HYSTER-YALE GROUP
2200 MENELAUS PIKE
BEREA, KY
US 40403
Contact: WARREN WILLIAMS
warren.williams@hyster-yale.com
T: (859)228-1524
F:

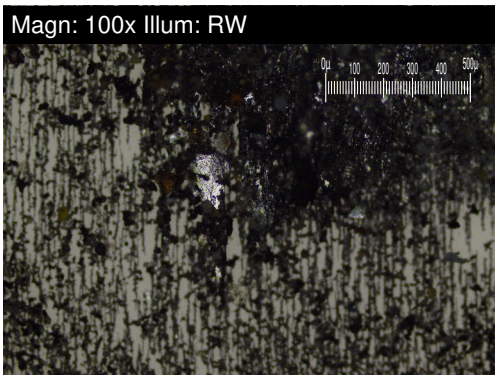
FERROGRAPHY REPORT

Area
[185832-N2STV4W]
Machine Id
TEST RIG
Component
Transmission (Manual)
Fluid
J20C (--- LTR)

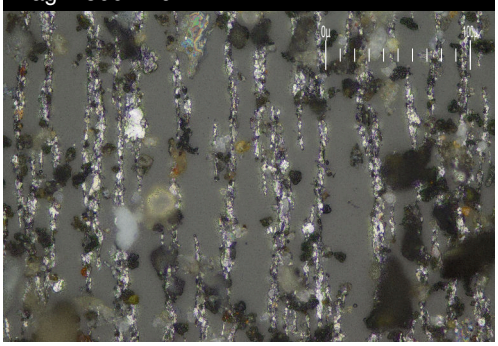
Magn: 100x Illum: RW



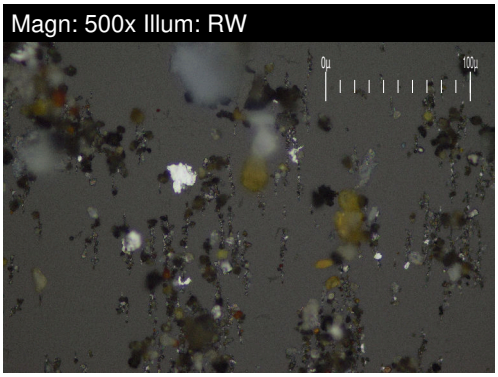
Magn: 100x Illum: RW



Magn: 500x Illum: RW



Magn: 500x Illum: RW



FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	*ASTM D7684		4		
Ferrous Sliding	Scale 0-10	*ASTM D7684				
Ferrous Cutting	Scale 0-10	*ASTM D7684				
Ferrous Rolling	Scale 0-10	*ASTM D7684		3		
Ferrous Break-in	Scale 0-10	*ASTM D7684				
Ferrous Spheres	Scale 0-10	*ASTM D7684				
Ferrous Black Oxides	Scale 0-10	*ASTM D7684		6		
Ferrous Red Oxides	Scale 0-10	*ASTM D7684				
Ferrous Corrosive	Scale 0-10	*ASTM D7684				
Ferrous Other	Scale 0-10	*ASTM D7684				
Nonferrous Rubbing	Scale 0-10	*ASTM D7684		3		
Nonferrous Sliding	Scale 0-10	*ASTM D7684				
Nonferrous Cutting	Scale 0-10	*ASTM D7684				
Nonferrous Rolling	Scale 0-10	*ASTM D7684				
Nonferrous Other	Scale 0-10	*ASTM D7684				
Carbonaceous Material	Scale 0-10	*ASTM D7684				
Lubricant Degradation	Scale 0-10	*ASTM D7684				
Sand/Dirt	Scale 0-10	ASTM D7684				
Fibres	Scale 0-10	*ASTM D7684		3		
Spheres	Scale 0-10	*ASTM D7684				
Other	Scale 0-10	*ASTM D7684		6		

WEAR

All component wear rates are normal.

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