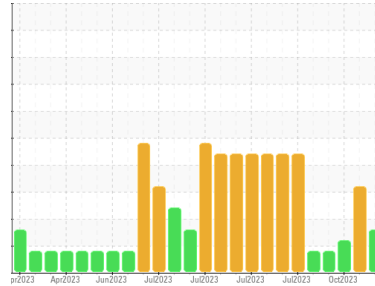




# OIL ANALYSIS REPORT

Sample Rating Trend



**WATER**



Area  
**RIG 879**  
 Machine Id  
**R879-MP-03**

Component  
**Gearbox**  
 Fluid  
**BRENNTAG COASTAL CHEMICAL HBC GEAR OIL 320 (--- GAL)**

## DIAGNOSIS

### Recommendation

We advise that you check for the source of water entry. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. Resample at the next service interval to monitor. There is too much water present in this sample to perform a particle count.

### Wear

All component wear rates are normal.

### Contamination

There is a high concentration of water present in the oil.

### Fluid Condition

The AN level is acceptable for this fluid.

## SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	<b>KL0013030</b>	KL0012931	KL0012924
Sample Date	Client Info	<b>14 Nov 2023</b>	01 Nov 2023	24 Oct 2023
Machine Age	days	<b>0</b>	45132	0
Oil Age	days	<b>0</b>	45132	0
Oil Changed	Client Info	<b>N/A</b>	N/A	N/A
Sample Status		<b>ABNORMAL</b>	SEVERE	ABNORMAL

## WEAR METALS

method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m >200	<b>30</b>	12	18
Chromium	ppm	ASTM D5185m >10	<b>&lt;1</b>	0	<1
Nickel	ppm	ASTM D5185m >10	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m	<b>0</b>	0	0
Silver	ppm	ASTM D5185m	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m >25	<b>1</b>	<1	<1
Lead	ppm	ASTM D5185m >50	<b>0</b>	0	0
Copper	ppm	ASTM D5185m >200	<b>5</b>	1	3
Tin	ppm	ASTM D5185m >10	<b>&lt;1</b>	0	0
Vanadium	ppm	ASTM D5185m	<b>&lt;1</b>	0	0
Cadmium	ppm	ASTM D5185m	<b>0</b>	0	0

## ADDITIVES

method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m	<b>7</b>	2	2
Barium	ppm	ASTM D5185m	<b>0</b>	<1	1
Molybdenum	ppm	ASTM D5185m	<b>&lt;1</b>	0	1
Manganese	ppm	ASTM D5185m	<b>&lt;1</b>	0	0
Magnesium	ppm	ASTM D5185m	<b>10</b>	6	8
Calcium	ppm	ASTM D5185m	<b>27</b>	23	19
Phosphorus	ppm	ASTM D5185m	<b>101</b>	100	93
Zinc	ppm	ASTM D5185m	<b>40</b>	48	43
Sulfur	ppm	ASTM D5185m	<b>8707</b>	9450	9759

## CONTAMINANTS

method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m >50	<b>10</b>	8	11
Sodium	ppm	ASTM D5185m	<b>253</b>	78	44
Potassium	ppm	ASTM D5185m >20	<b>4</b>	1	2
Water	%	ASTM D6304 >0.2	<b>▲ 0.810</b>	2.75	NEG
ppm Water	ppm	ASTM D6304 >2000	<b>▲ 8100</b>	27500	---

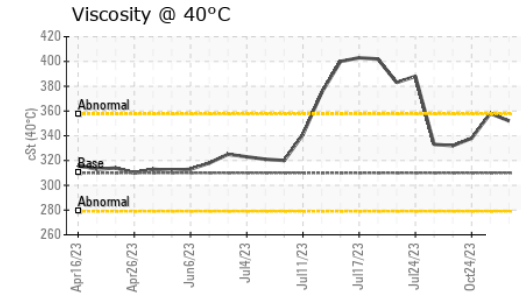
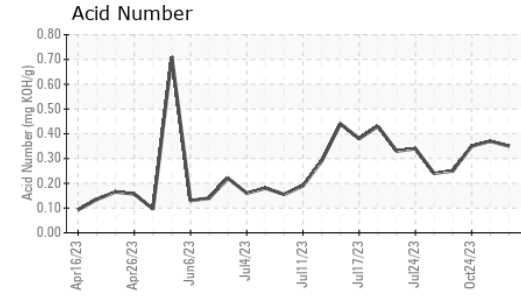
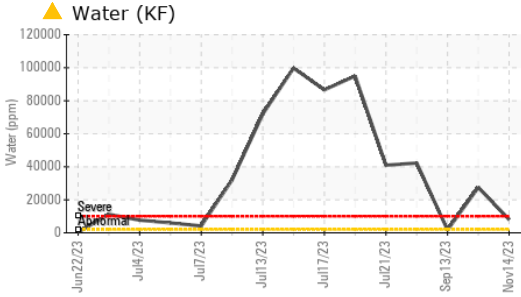
## FLUID CLEANLINESS

method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647 >20000	---	---	▲ 119397
Particles >6µm	ASTM D7647 >5000	---	---	▲ 28925
Particles >14µm	ASTM D7647 >640	---	---	142
Particles >21µm	ASTM D7647 >160	---	---	19
Particles >38µm	ASTM D7647 >40	---	---	0
Particles >71µm	ASTM D7647 >10	---	---	0
Oil Cleanliness	ISO 4406 (c) >21/19/16	---	---	▲ 24/22/14

## FLUID DEGRADATION

method	limit/base	current	history1	history2	
Acid Number (AN)	mg KOH/g	ASTM D8045	<b>0.35</b>	0.37	0.35

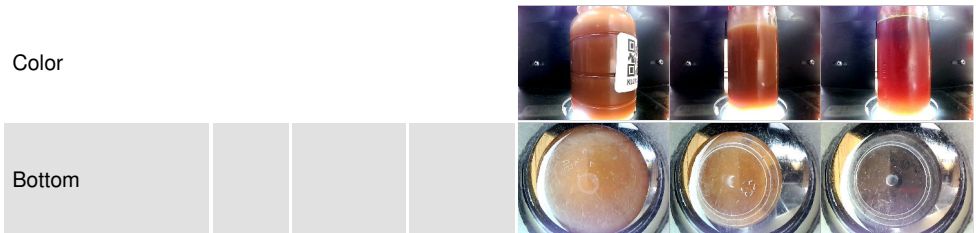
# OIL ANALYSIS REPORT



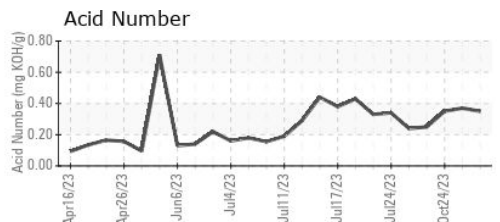
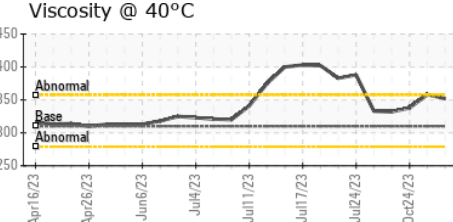
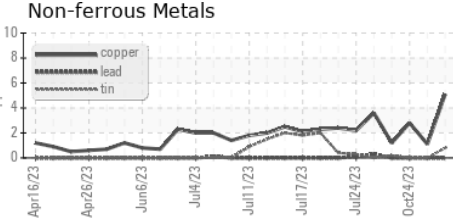
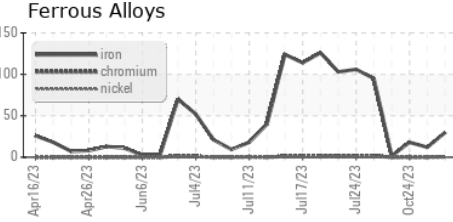
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance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

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445 310	352	358	338

SAMPLE IMAGES	method	limit/base	current	history1	history2
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## GRAPHS



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : KL0013030 **Received** : 20 Nov 2023  
**Lab Number** : 06012381 **Diagnosed** : 22 Nov 2023  
**Unique Number** : 10751525 **Diagnostician** : Don Baldrige  
**Test Package** : MOB 2 ( Additional Tests: KF, PrtCount )

**PATTERSON - UTI DRILLING**  
 9915 WEST INDUSTRIAL  
 MIDLAND, TX  
 US 79706  
 Contact: RICKY MATA  
 ricky.mata@patenergy.com  
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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)