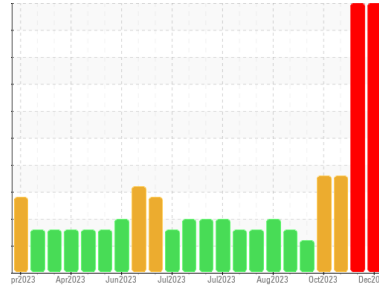




# OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Area  
**RIG 879**  
 Machine Id  
**R879-MP-01**

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 recommend that you drain the oil from the component if this has not already been done. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition. There is too much water present in this sample to perform a particle count.

### Wear

A sharp increase in the iron level is noted. Gear wear is indicated.

### Contamination

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

### Fluid Condition

The oil is no longer serviceable due to the presence of contaminants.

## SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>KL0013103</b>	KL0013032	KL0012933
Sample Date	Client Info		<b>01 Dec 2023</b>	14 Nov 2023	01 Nov 2023
Machine Age	days	Client Info	<b>45146</b>	0	45146
Oil Age	days	Client Info	<b>45146</b>	0	45146
Oil Changed	Client Info		<b>N/A</b>	N/A	N/A
Sample Status			<b>SEVERE</b>	SEVERE	SEVERE

## WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >200	<b>1090</b>	741	94
Chromium	ppm	ASTM D5185m >10	<b>17</b>	11	2
Nickel	ppm	ASTM D5185m >10	<b>2</b>	1	0
Titanium	ppm	ASTM D5185m	<b>&lt;1</b>	<1	0
Silver	ppm	ASTM D5185m	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m >25	<b>5</b>	4	4
Lead	ppm	ASTM D5185m >50	<b>0</b>	0	0
Copper	ppm	ASTM D5185m >200	<b>6</b>	5	2
Tin	ppm	ASTM D5185m >10	<b>2</b>	3	1
Vanadium	ppm	ASTM D5185m	<b>&lt;1</b>	<1	0
Cadmium	ppm	ASTM D5185m	<b>&lt;1</b>	0	0

## ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	<b>4</b>	8	7
Barium	ppm	ASTM D5185m	<b>7</b>	0	7
Molybdenum	ppm	ASTM D5185m	<b>12</b>	12	10
Manganese	ppm	ASTM D5185m	<b>7</b>	4	<1
Magnesium	ppm	ASTM D5185m	<b>22</b>	13	20
Calcium	ppm	ASTM D5185m	<b>49</b>	62	83
Phosphorus	ppm	ASTM D5185m	<b>87</b>	76	88
Zinc	ppm	ASTM D5185m	<b>55</b>	52	63
Sulfur	ppm	ASTM D5185m	<b>9709</b>	8865	9911

## CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >50	<b>23</b>	19	16
Sodium	ppm	ASTM D5185m	<b>83</b>	126	93
Potassium	ppm	ASTM D5185m >20	<b>4</b>	3	3
Water	%	ASTM D6304 >0.2	<b>4.74</b>	11.7	5.99
ppm Water	ppm	ASTM D6304 >2000	<b>47400</b>	117000	59900

## FLUID CLEANLINESS

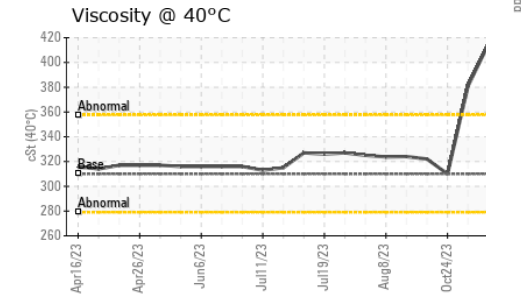
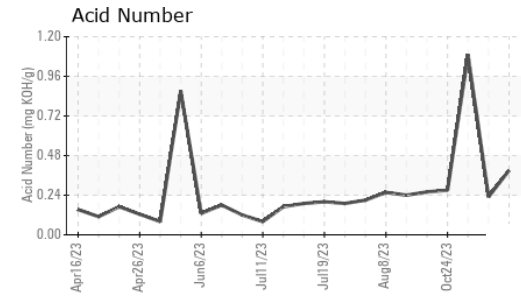
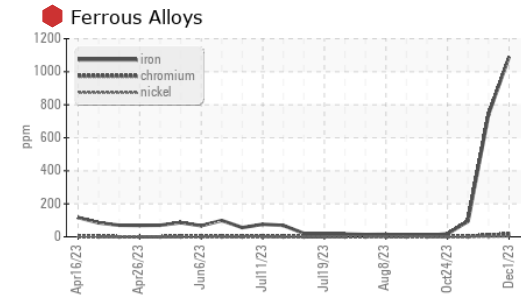
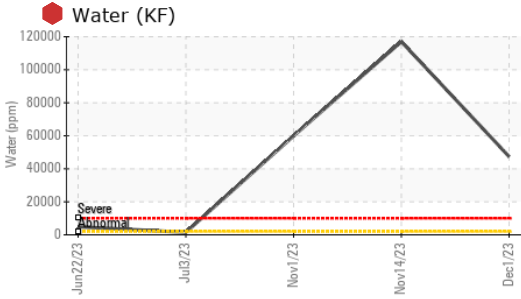
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>20000	---	---	---
Particles >6µm	ASTM D7647	>5000	---	---	---
Particles >14µm	ASTM D7647	>640	---	---	---
Particles >21µm	ASTM D7647	>160	---	---	---
Particles >38µm	ASTM D7647	>40	---	---	---
Particles >71µm	ASTM D7647	>10	---	---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

## FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	<b>0.39</b>	0.23	1.09



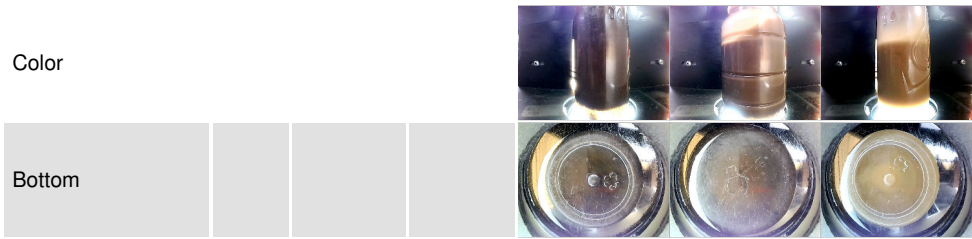
# OIL ANALYSIS REPORT



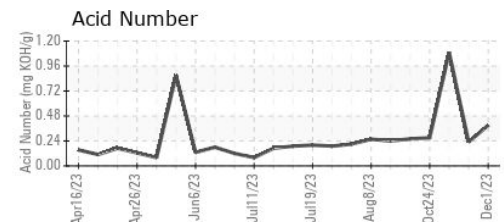
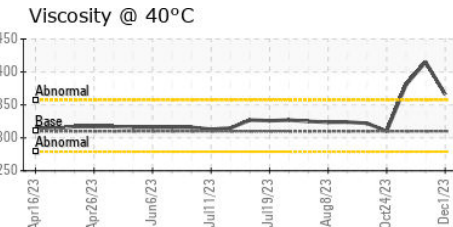
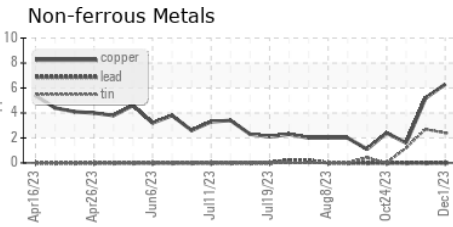
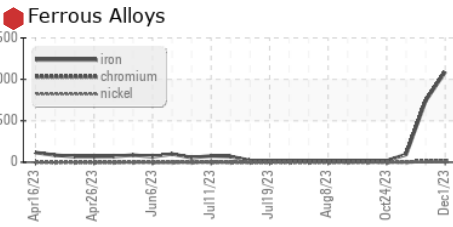
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	MODER	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445 310	366	415	381

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



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : KL0013103 **Received** : 07 Dec 2023  
**Lab Number** : 06028657 **Diagnosed** : 11 Dec 2023  
**Unique Number** : 10778448 **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  
 T: (832)219-4559  
 F: (432)561-9388

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)