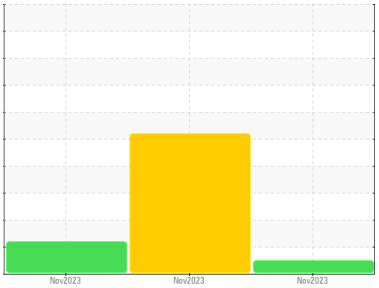
OIL ANALYSIS REPORT

Sample Rating Trend



UNKNOWN

Area
RIG 816
Machine Id
R816-MP-02
Component
Gearbox
Fluid
NOT GIVEN (--- GAL)

DIAGNOSIS

Recommendation
We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

▲ Contamination
There is a high amount of particulates present in the oil.

Fluid Condition
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**KL0013023**	KL0012971	KL0013155
Sample Date		Client Info		**10 Nov 2023**	05 Nov 2023	01 Nov 2023
Machine Age	hrs	Client Info		**0**	0	0
Oil Age	hrs	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**---**	ABNORMAL	ABNORMAL

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>200	**30**	▲ 256	23
Chromium	ppm	ASTM D5185m	>10	**0**	<1	0
Nickel	ppm	ASTM D5185m		**0**	0	0
Titanium	ppm	ASTM D5185m		**0**	3	0
Silver	ppm	ASTM D5185m		**0**	0	0
Aluminum	ppm	ASTM D5185m	>25	**2**	▲ 10	<1
Lead	ppm	ASTM D5185m	>50	**0**	0	0
Copper	ppm	ASTM D5185m	>200	**21**	36	20
Tin	ppm	ASTM D5185m	>10	**0**	0	0
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**<1**	8	2
Barium	ppm	ASTM D5185m		**<1**	30	0
Molybdenum	ppm	ASTM D5185m		**0**	0	0
Manganese	ppm	ASTM D5185m		**<1**	2	0
Magnesium	ppm	ASTM D5185m		**0**	8	0
Calcium	ppm	ASTM D5185m		**16**	61	17
Phosphorus	ppm	ASTM D5185m		**123**	151	127
Zinc	ppm	ASTM D5185m		**40**	61	40
Sulfur	ppm	ASTM D5185m		**7527**	6986	6784

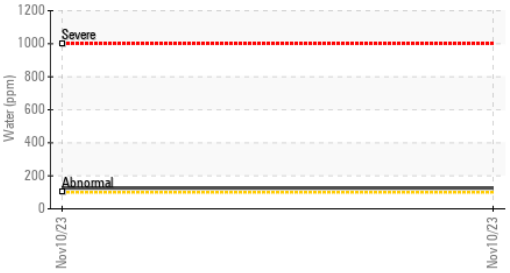
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	**14**	▲ 46	9
Sodium	ppm	ASTM D5185m		**12**	83	12
Potassium	ppm	ASTM D5185m	>20	**<1**	6	0
Water	%	ASTM D6304		**0.012**	NEG	NEG
ppm Water	ppm	ASTM D6304		**125.6**	---	---

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>20000	▲ **156542**	▲ 268480	▲ 55659
Particles >6µm		ASTM D7647	>5000	▲ **61493**	▲ 195185	▲ 5550
Particles >14µm		ASTM D7647	>640	▲ **2321**	▲ 11053	104
Particles >21µm		ASTM D7647	>160	▲ **266**	▲ 559	18
Particles >38µm		ASTM D7647	>40	**3**	1	0
Particles >71µm		ASTM D7647	>10	**0**	0	0
Oil Cleanliness		ISO 4406 (c)	>21/19/16	▲ **24/23/18**	▲ 25/25/21	▲ 23/20/14

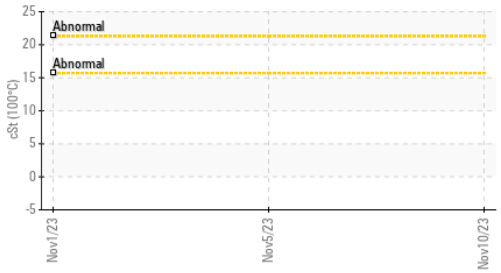
FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		**0.30**	0.37	0.34

OIL ANALYSIS REPORT

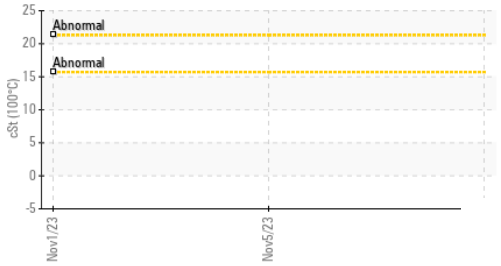
Water (KF)



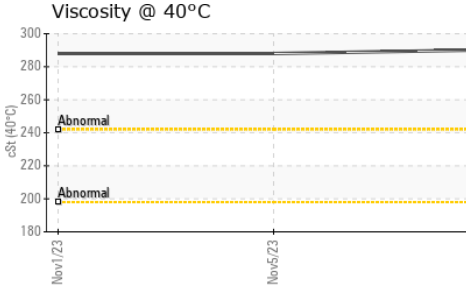
Viscosity @ 100°C



Viscosity @ 100°C



Viscosity @ 40°C



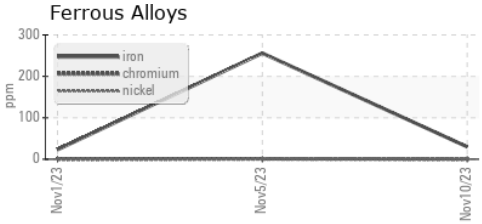
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445		**290.2**	288	288

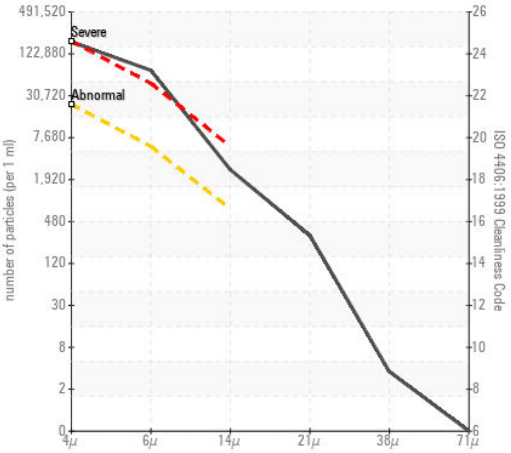
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

GRAPHS

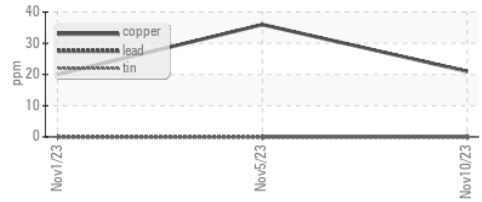
Ferrous Alloys



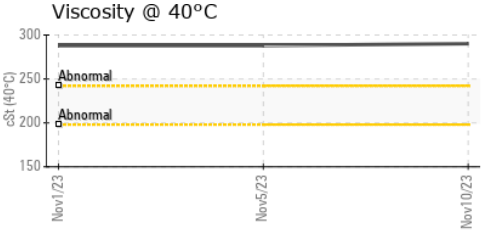
Particle Count



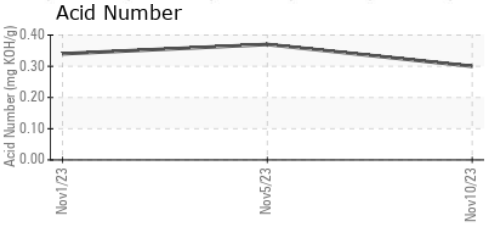
Non-ferrous Metals



Viscosity @ 40°C



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013023 **Received** : 16 Nov 2023
Lab Number : 06009962 **Diagnosed** : 20 Nov 2023
Unique Number : 10749106 **Diagnostician** : Doug Bogart
Test Package : MOB 2 (Additional Tests: FT-IR, KF, KV100, PrtCount, VI)

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)

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