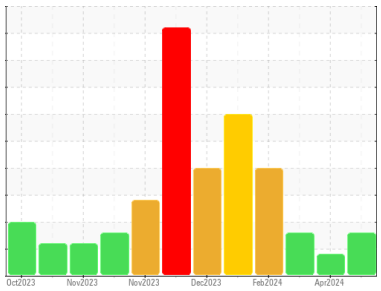
OIL ANALYSIS REPORT

Sample Rating Trend



VISCOSITY

Area
RIG 813
Machine Id
R813-MP-02
Component
Gearbox
Fluid
GEAR OIL ISO 320 (--- GAL)

DIAGNOSIS

Recommendation
No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is a high amount of silt (particulates < 14 microns in size) present in the oil.

Fluid Condition
The oil viscosity is lower than normal. Confirm oil type.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**KL0014285**	KL0014298	KL0013738
Sample Date		Client Info		**07 May 2024**	03 Apr 2024	05 Mar 2024
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**	ATTENTION	ABNORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>0.2	**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>200	**10**	13	10
Chromium	ppm	ASTM D5185m	>10	**0**	0	0
Nickel	ppm	ASTM D5185m	>10	**0**	0	0
Titanium	ppm	ASTM D5185m		**<1**	0	0
Silver	ppm	ASTM D5185m		**<1**	0	0
Aluminum	ppm	ASTM D5185m	>25	**2**	0	0
Lead	ppm	ASTM D5185m	>50	**0**	1	0
Copper	ppm	ASTM D5185m	>200	**10**	4	6
Tin	ppm	ASTM D5185m	>10	**0**	0	0
Vanadium	ppm	ASTM D5185m		**<1**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	50	**2**	0	6
Barium	ppm	ASTM D5185m	15	**11**	0	0
Molybdenum	ppm	ASTM D5185m	15	**<1**	0	0
Manganese	ppm	ASTM D5185m		**0**	<1	0
Magnesium	ppm	ASTM D5185m	50	**8**	6	0
Calcium	ppm	ASTM D5185m	50	**18**	10	4
Phosphorus	ppm	ASTM D5185m	350	**299**	381	324
Zinc	ppm	ASTM D5185m	100	**46**	0	4
Sulfur	ppm	ASTM D5185m	12500	**14779**	23364	20081

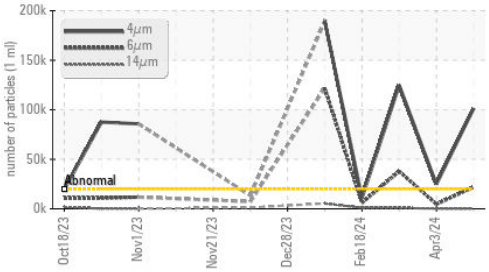
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	**9**	<1	2
Sodium	ppm	ASTM D5185m		**12**	7	7
Potassium	ppm	ASTM D5185m	>20	**2**	0	0

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>20000	▲ **101305**	● 24857	▲ 124776
Particles >6µm		ASTM D7647	>5000	▲ **22054**	4610	▲ 37841
Particles >14µm		ASTM D7647	>640	**112**	146	▲ 874
Particles >21µm		ASTM D7647	>160	**16**	35	130
Particles >38µm		ASTM D7647	>40	**1**	1	2
Particles >71µm		ASTM D7647	>10	**0**	0	0
Oil Cleanliness		ISO 4406 (c)	>21/19/16	▲ **24/22/14**	● 22/19/14	▲ 24/22/17

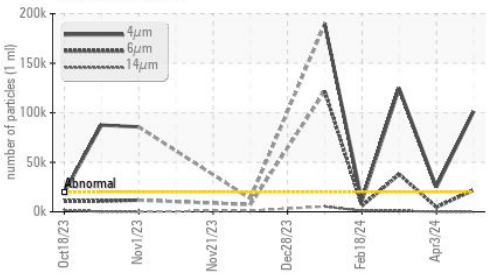
FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	0.85	**0.60**	0.88	1.06

OIL ANALYSIS REPORT

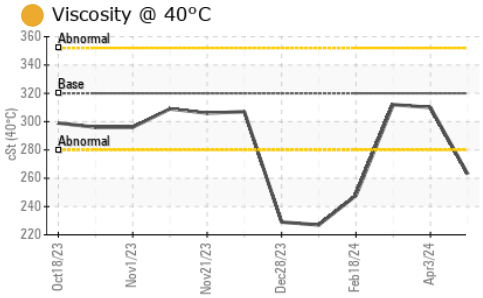
Particle Trend



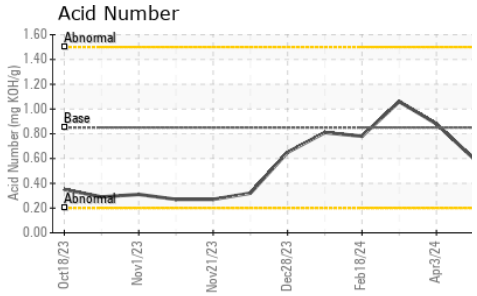
Particle Trend



Viscosity @ 40°C



Acid Number



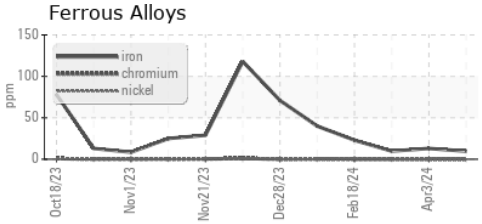
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**LIGHT**	NONE	NONE
Sand/Dirt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

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	320	**263**	310	312

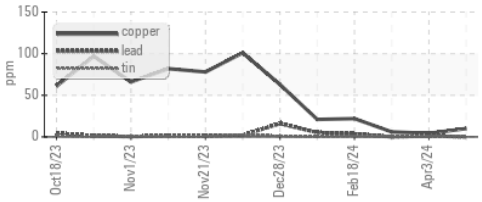
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

GRAPHS

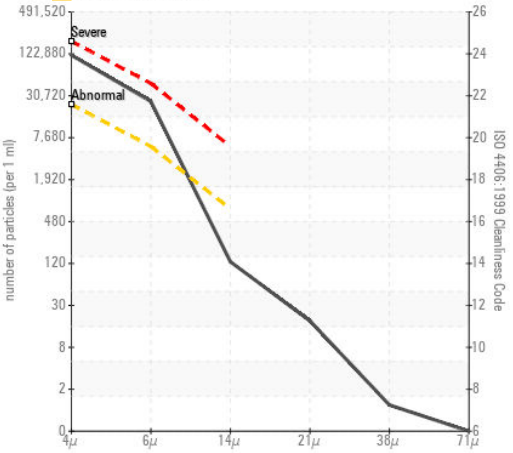
Ferrous Alloys



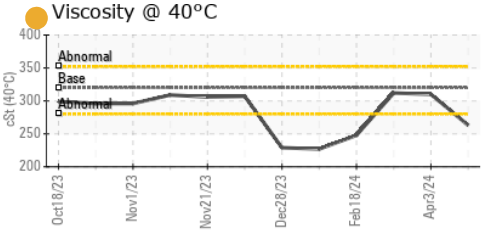
Non-ferrous Metals



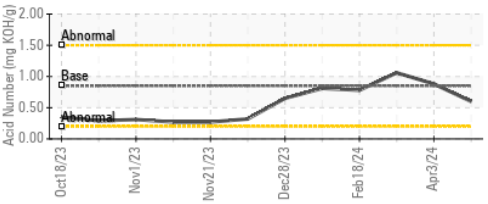
Particle Count



Viscosity @ 40°C



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0014285 **Received** : 16 May 2024
Lab Number : 06181303 **Tested** : 17 May 2024
Unique Number : 11032629 **Diagnosed** : 20 May 2024 - Jonathan Hester
Test Package : MOB 2 (Additional Tests: PrtCount)

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