



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Area
RIG 3
 Machine Id
WHITE STAR 2450 R3-P-01G-NKL
 Component
Gearbox
 Fluid
GEAR OIL ISO 460 (--- GAL)

RECOMMENDATION

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor. We were unable to perform a particle count due to a high concentration of particles present in this sample.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		KL0013884	KL0014010	KL0014064
Sample Date		Client Info		23 Feb 2024	17 Jan 2024	28 Dec 2023
Machine Age	days	Client Info		45345	43803	45288
Oil Age	days	Client Info		0	0	0
Filter Age	days	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				ABNORMAL	ABNORMAL	SEVERE

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>200	123	▲ 358	▲ 637
Chromium	ppm	ASTM D5185m	>10	<1	3	4
Nickel	ppm	ASTM D5185m	>10	0	3	4
Titanium	ppm	ASTM D5185m		<1	<1	0
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>25	8	● 12	● 22
Lead	ppm	ASTM D5185m	>50	0	1	2
Copper	ppm	ASTM D5185m	>200	28	66	111
Tin	ppm	ASTM D5185m	>10	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

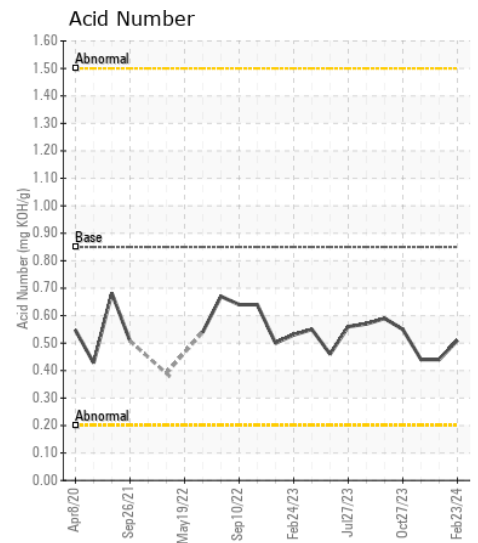
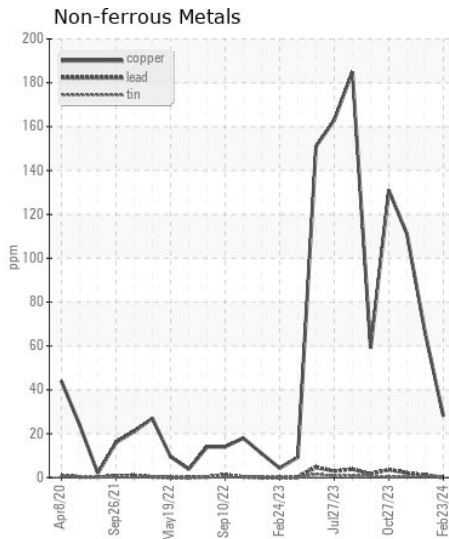
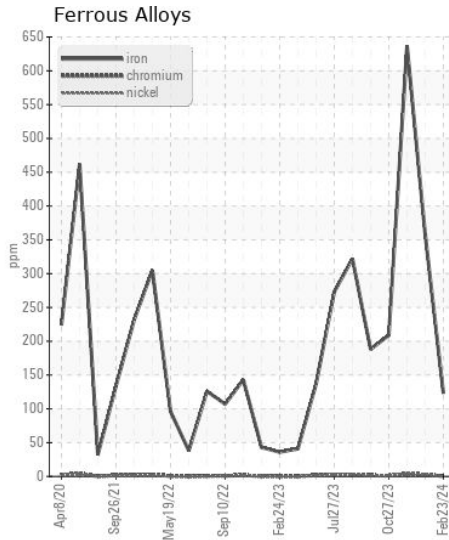
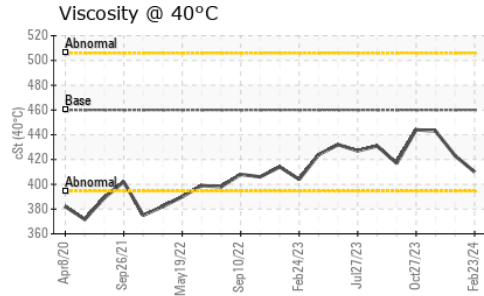
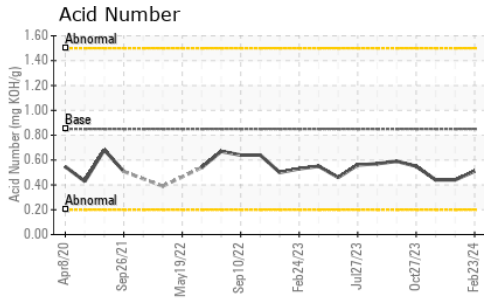
There is a high amount of visible silt present in the sample.

Silicon	ppm	ASTM D5185m	>50	31	▲ 67	▲ 114
Potassium	ppm	ASTM D5185m	>20	6	24	27
Water		WC Method	>0.2	NEG	NEG	NEG
Particles >4µm		ASTM D7647		---	291813	11858
Particles >6µm		ASTM D7647	>5000	---	▲ 232014	● 6459
Particles >14µm		ASTM D7647	>640	---	▲ 22985	● 1099
Particles >21µm		ASTM D7647	>160	---	▲ 844	● 370
Particles >38µm		ASTM D7647	>40	---	3	● 57
Particles >71µm		ASTM D7647	>10	---	0	6
Oil Cleanliness		ISO 4406 (c)	>19/16	---	▲ 25/22	● 20/17
Silt	scalar	*Visual	NONE	▲ HEAVY	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	>0.2	NEG	NEG	NEG

FLUID CONDITION

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

Sodium	ppm	ASTM D5185m		69	212	481
Boron	ppm	ASTM D5185m	50	46	29	21
Barium	ppm	ASTM D5185m	15	31	88	86
Molybdenum	ppm	ASTM D5185m	15	434	12	19
Manganese	ppm	ASTM D5185m		1	3	4
Magnesium	ppm	ASTM D5185m	50	8	30	31
Calcium	ppm	ASTM D5185m	50	34	89	93
Phosphorus	ppm	ASTM D5185m	350	244	239	240
Zinc	ppm	ASTM D5185m	100	18	50	68
Sulfur	ppm	ASTM D5185m	12500	8861	8303	8509
Acid Number (AN)	mg KOH/g	ASTM D8045	0.85	0.51	0.44	0.44
Visc @ 40°C	cSt	ASTM D445	460	410	423	443



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013884
Lab Number : 06125608
Unique Number : 10939759
Test Package : MOB 2 (Additional Tests: PrtCount)

Received : 21 Mar 2024
Tested : 26 Mar 2024
Diagnosed : 26 Mar 2024 - Jonathan Hester

CITADEL DRILLING
 7550 W I20
 ODESSA, TX
 US 79763

Contact: MIKE COMBDEN
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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)

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F: