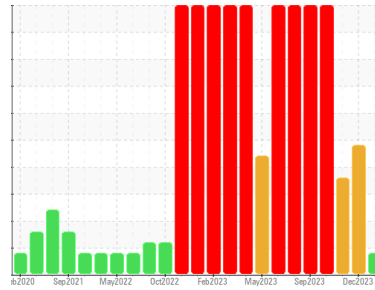




# OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area  
**RIG 4**  
Machine Id  
**WHITE STAR 2450 R4-P-01G NKL**  
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 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		<b>KL0013890</b>	KL0014059	KL0013130
Sample Date	Client Info		<b>28 Feb 2024</b>	12 Dec 2023	03 Nov 2023
Machine Age	days	Client Info	<b>45350</b>	45272	45233
Oil Age	days	Client Info	<b>0</b>	0	0
Oil Changed	Client Info		<b>N/A</b>	N/A	N/A
Sample Status			<b>ABNORMAL</b>	ABNORMAL	ABNORMAL

## CONTAMINATION

	method	limit/base	current	history1	history2
Water	WC Method	>0.2	<b>NEG</b>	NEG	NEG

## WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >200	<b>62</b>	▲ 281	209
Chromium	ppm	ASTM D5185m >10	<b>&lt;1</b>	<1	2
Nickel	ppm	ASTM D5185m >10	<b>0</b>	2	2
Titanium	ppm	ASTM D5185m	<b>0</b>	0	<1
Silver	ppm	ASTM D5185m	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m >25	<b>2</b>	● 13	● 14
Lead	ppm	ASTM D5185m >50	<b>0</b>	0	0
Copper	ppm	ASTM D5185m >200	<b>9</b>	23	18
Tin	ppm	ASTM D5185m >10	<b>&lt;1</b>	0	<1
Vanadium	ppm	ASTM D5185m	<b>0</b>	0	0
Cadmium	ppm	ASTM D5185m	<b>0</b>	0	0

## ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 50	<b>27</b>	25	27
Barium	ppm	ASTM D5185m 15	<b>4</b>	28	29
Molybdenum	ppm	ASTM D5185m 15	<b>11</b>	15	15
Manganese	ppm	ASTM D5185m	<b>1</b>	1	2
Magnesium	ppm	ASTM D5185m 50	<b>4</b>	27	22
Calcium	ppm	ASTM D5185m 50	<b>23</b>	98	81
Phosphorus	ppm	ASTM D5185m 350	<b>250</b>	254	284
Zinc	ppm	ASTM D5185m 100	<b>7</b>	23	15
Sulfur	ppm	ASTM D5185m 12500	<b>8450</b>	7147	7665

## CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >50	<b>16</b>	▲ 60	▲ 59
Sodium	ppm	ASTM D5185m	<b>25</b>	160	138
Potassium	ppm	ASTM D5185m >20	<b>0</b>	9	8

## FLUID CLEANLINESS

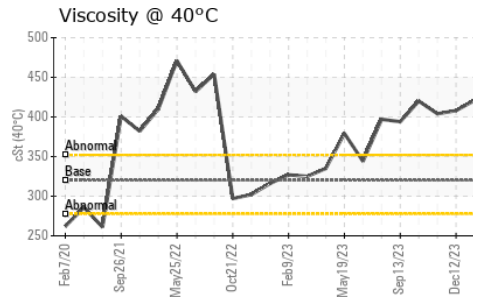
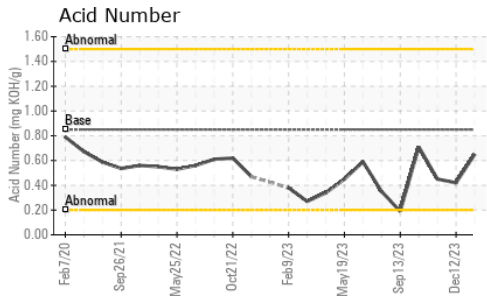
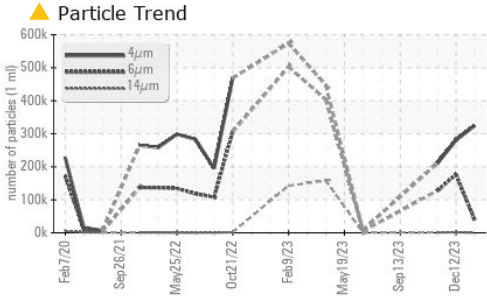
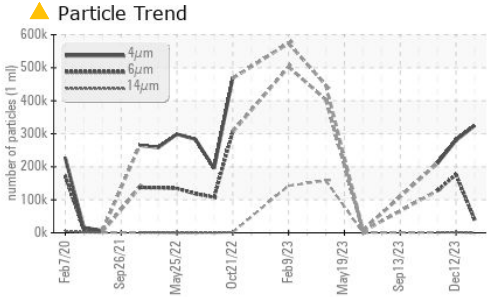
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		<b>324604</b>	280125	210206
Particles >6µm	ASTM D7647	>5000	▲ <b>39971</b>	▲ 176440	▲ 127596
Particles >14µm	ASTM D7647	>640	<b>98</b>	▲ 1761	▲ 1113
Particles >21µm	ASTM D7647	>160	<b>8</b>	▲ 161	119
Particles >38µm	ASTM D7647	>40	<b>0</b>	2	5
Particles >71µm	ASTM D7647	>10	<b>0</b>	1	1
Oil Cleanliness	ISO 4406 (c)	>19/16	▲ <b>22/14</b>	▲ 25/18	▲ 24/17

## FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045 0.85	<b>0.65</b>	0.42	0.45



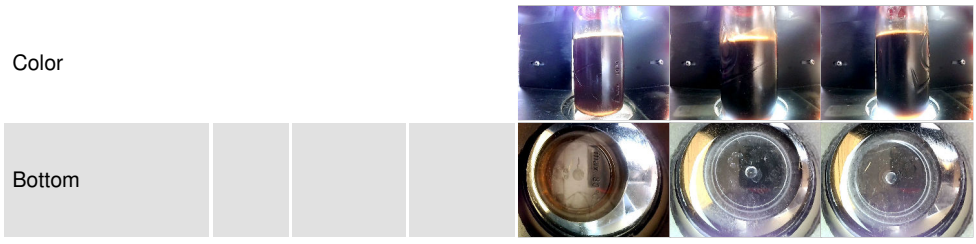
# OIL ANALYSIS REPORT



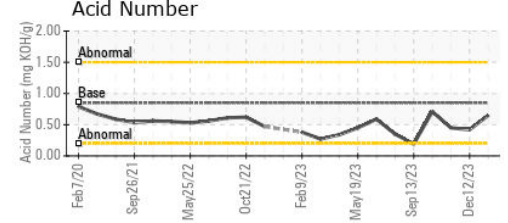
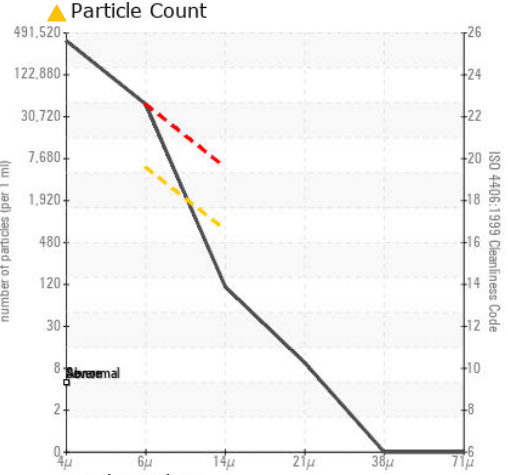
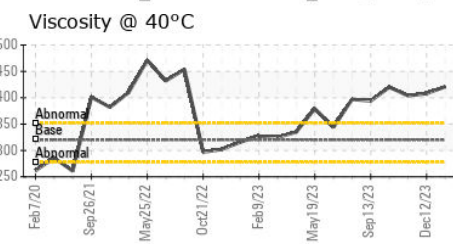
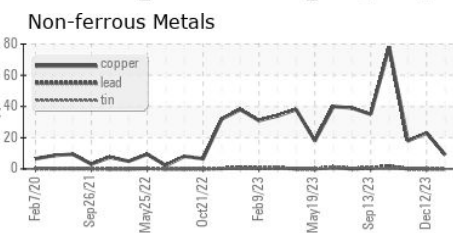
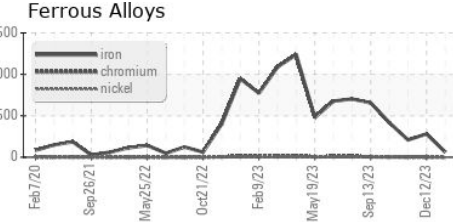
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	LIGHT
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance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

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445 320	421	408	404

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



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : KL0013890 **Received** : 21 Mar 2024  
**Lab Number** : 06125609 **Tested** : 26 Mar 2024  
**Unique Number** : 10939760 **Diagnosed** : 26 Mar 2024 - Jonathan Hester  
**Test Package** : MOB 2 ( Additional Tests: PrtCount )

**CITADEL DRILLING**  
 7550 W I20  
 ODESSA, TX  
 US 79763  
 Contact: MIKE COMBDEN  
 mcombden@citadelldrilling.com  
 T: (780)955-5509  
 F:

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)