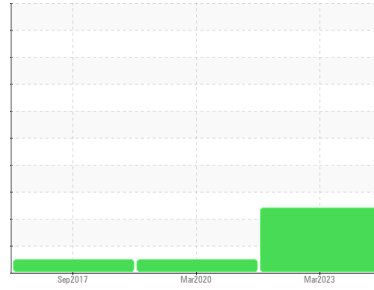


# OIL ANALYSIS REPORT



Machine Id  
**CATERPILLAR 12H GRADER 6438 (S/N 8MN00572)**  
Component  
**Right Final Drive**  
Fluid  
**TULBO LUBSOIL TO-4 50 (--- GAL)**

Sample Rating Trend



## DIAGNOSIS

### Recommendation

We recommend an early resample to monitor this condition. ( Customer Sample Comment: 263 is machines hrs )

### Wear

Gear wear is indicated.

### Contamination

There is no indication of any contamination 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>TO10001721</b>	TO1006883	TO1005547
Sample Date	Client Info		<b>20 Mar 2023</b>	23 Mar 2020	09 Sep 2017
Machine Age	hrs	Client Info	<b>263</b>	13896	13102
Oil Age	hrs	Client Info	<b>263</b>	1019	0
Oil Changed	Client Info		<b>Not Chngd</b>	Not Chngd	N/A
Sample Status			<b>ABNORMAL</b>	NORMAL	NORMAL

## 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
PQ	ASTM D8184	>500	<b>102</b>	452	237
Iron	ppm	ASTM D5185m	>500 <b>▲ 533</b>	240	139
Chromium	ppm	ASTM D5185m	>10 <b>▲ 15</b>	<1	<1
Nickel	ppm	ASTM D5185m	<b>1</b>	<1	<1
Titanium	ppm	ASTM D5185m	<b>2</b>	0	0
Silver	ppm	ASTM D5185m	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>25 <b>▲ 22</b>	2	1
Lead	ppm	ASTM D5185m	>25 <b>2</b>	<1	<1
Copper	ppm	ASTM D5185m	>50 <b>2</b>	<1	<1
Tin	ppm	ASTM D5185m	>10 <b>0</b>	0	0
Antimony	ppm	ASTM D5185m	<b>---</b>	0	0
Vanadium	ppm	ASTM D5185m	<b>1</b>	0	0
Cadmium	ppm	ASTM D5185m	<b>0</b>	0	0

## ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	<b>&lt;1</b>	5	4
Barium	ppm	ASTM D5185m	<b>65</b>	0	0
Molybdenum	ppm	ASTM D5185m	<b>11</b>	2	3
Manganese	ppm	ASTM D5185m	<b>7</b>	2	2
Magnesium	ppm	ASTM D5185m	<b>16</b>	14	16
Calcium	ppm	ASTM D5185m	<b>3230</b>	4098	3856
Phosphorus	ppm	ASTM D5185m	<b>1167</b>	932	927
Zinc	ppm	ASTM D5185m	<b>1352</b>	1081	1079
Sulfur	ppm	ASTM D5185m	<b>10388</b>	7261	3502

## CONTAMINANTS

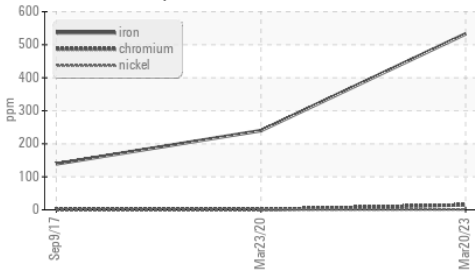
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>75 <b>23</b>	14	11
Sodium	ppm	ASTM D5185m	<b>11</b>	<1	1
Potassium	ppm	ASTM D5185m	>20 <b>6</b>	<1	0

## FLUID DEGRADATION

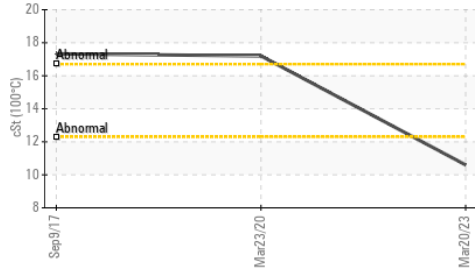
	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	<b>1.27</b>	1.302	1.143

# OIL ANALYSIS REPORT

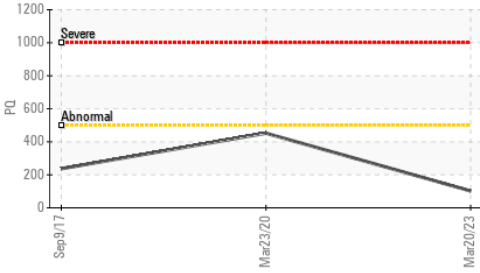
### ▲ Ferrous Alloys



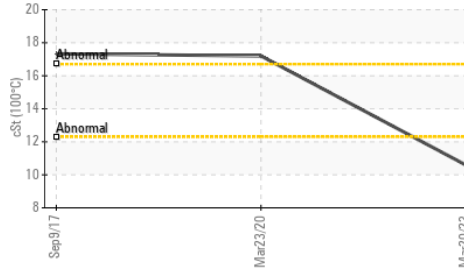
### Viscosity @ 100°C



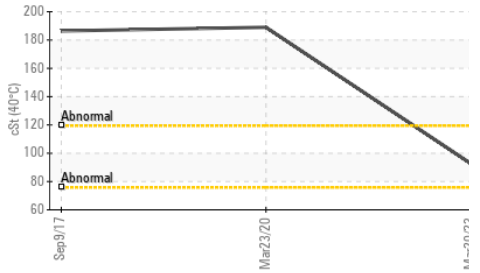
### PQ



### Viscosity @ 100°C



### Viscosity @ 40°C



VISUAL	method	limit/base	current	history1	history2	
White Metal	scalar	*Visual	NONE	NONE	MODER	LIGHT
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	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

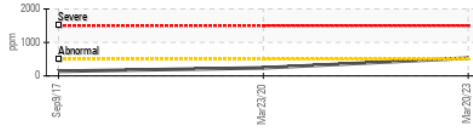
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	92.8	189	186.4
Visc @ 100°C	cSt	ASTM D445	10.6	17.2	17.33
Viscosity Index (VI)	Scale	ASTM D2270	96	97	99

### SAMPLE IMAGES

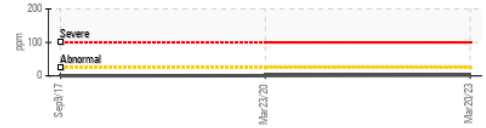
method	limit/base	current	history1	history2
Color		no image	no image	no image
Bottom		no image	no image	no image

### GRAPHS

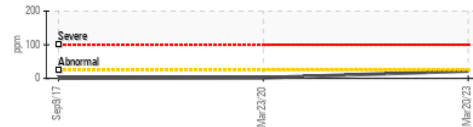
#### ▲ Iron (ppm)



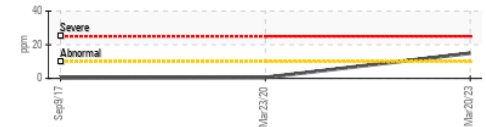
#### Lead (ppm)



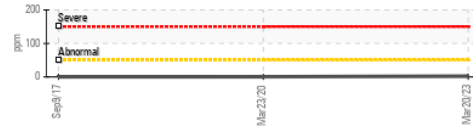
#### ▲ Aluminum (ppm)



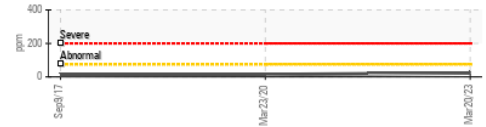
#### ▲ Chromium (ppm)



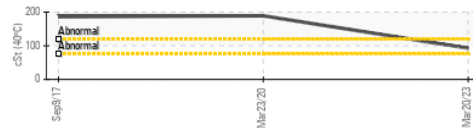
#### Copper (ppm)



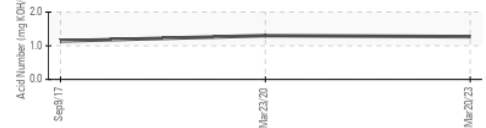
#### Silicon (ppm)



#### Viscosity @ 40°C



#### Acid Number



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513

**Sample No.** : TO10001721

**Lab Number** : 05804115

**Unique Number** : 10401644

**Test Package** : MOB 2 ( Additional Tests: KV100, PQ, 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)

**Received** : 28 Mar 2023

**Tested** : 31 Mar 2023

**Diagnosed** : 31 Mar 2023 - Jonathan Hester

**ANCHOR STONE TULSA ROCK**

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US 74137

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T: (417)850-9635

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