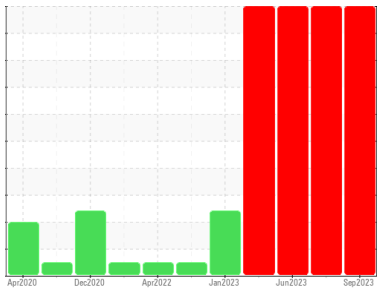
OIL ANALYSIS REPORT

Machine Id
CATERPILLAR 420 FST BACKHOE 6010 (S/N SKR04232)
Component
Front Left Planetary
Fluid
TULCO LUBSOIL TO-4 50 (0 GAL)

Sample Rating Trend



WEAR

DIAGNOSIS

Recommendation
We advise that you check all areas where dirt can enter the system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear
Gear wear is indicated.

Contamination
Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. There is a light concentration of water present in the oil.

Fluid Condition
The AN level is acceptable for this fluid.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**TO10002081**	TO10002404	TO10002382
Sample Date		Client Info		**18 Sep 2023**	25 Jul 2023	01 Jun 2023
Machine Age	hrs	Client Info		**12601**	12310	12039
Oil Age	hrs	Client Info		**291**	271	139
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**SEVERE**	SEVERE	SEVERE

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184		**231**	317	204
Iron	ppm	ASTM D5185m	>150	● **570**	● 652	● 463
Chromium	ppm	ASTM D5185m	>10	**5**	5	3
Nickel	ppm	ASTM D5185m	>10	**2**	<1	<1
Titanium	ppm	ASTM D5185m		**8**	10	11
Silver	ppm	ASTM D5185m		**0**	3	<1
Aluminum	ppm	ASTM D5185m	>25	▲ **125**	▲ 164	▲ 189
Lead	ppm	ASTM D5185m	>100	**10**	9	5
Copper	ppm	ASTM D5185m	>50	**8**	6	9
Tin	ppm	ASTM D5185m	>10	**<1**	1	3
Vanadium	ppm	ASTM D5185m		**<1**	<1	<1
Cadmium	ppm	ASTM D5185m		**<1**	<1	<1

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**2**	0	1
Barium	ppm	ASTM D5185m		**3**	0	3
Molybdenum	ppm	ASTM D5185m		**0**	<1	<1
Manganese	ppm	ASTM D5185m		**7**	7	5
Magnesium	ppm	ASTM D5185m		**160**	158	118
Calcium	ppm	ASTM D5185m		**7502**	6630	5825
Phosphorus	ppm	ASTM D5185m		**956**	971	978
Zinc	ppm	ASTM D5185m		**1176**	1210	1218
Sulfur	ppm	ASTM D5185m		**5402**	6020	6021

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	● **635**	● 707	● 665
Sodium	ppm	ASTM D5185m		**14**	19	15
Potassium	ppm	ASTM D5185m	>20	**44**	58	71
Water	%	ASTM D6304	>0.1	▲ **0.246**	▲ 0.608	---
ppm Water	ppm	ASTM D6304	>1000	▲ **2460**	▲ 6080	---

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		**1.50**	1.41	1.56

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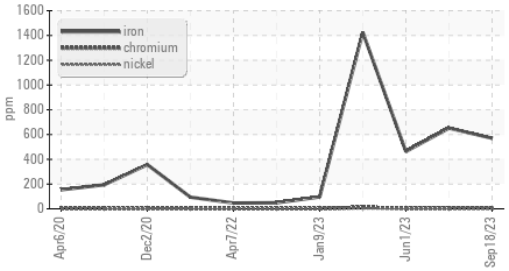
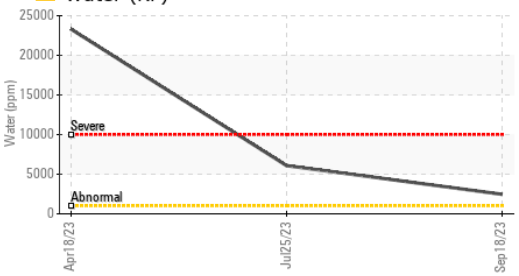
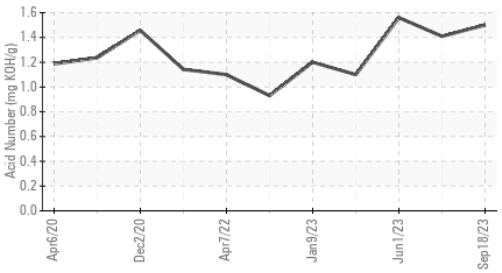
Ferrous Alloys



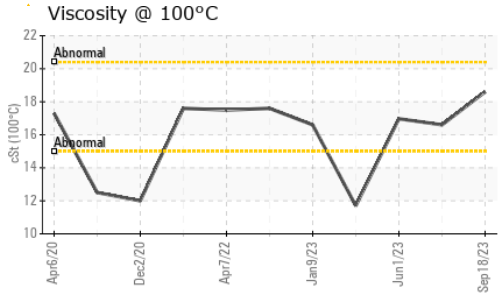
Water (KF)



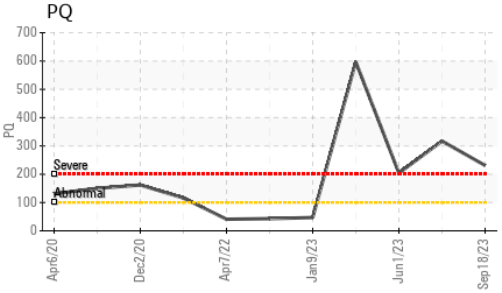
Acid Number



Viscosity @ 100°C



PQ



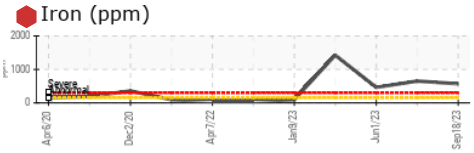
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	MODER	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	▲ HAZY	▲ HAZY
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	**0.2%**	▲ 0.2%	▲ 0.2%
Free Water	scalar	*Visual		**NEG**	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445		**227**	217	195
Visc @ 100°C	cSt	ASTM D445		**18.6**	16.6	16.97
Viscosity Index (VI)	Scale	ASTM D2270		**90**	76	91

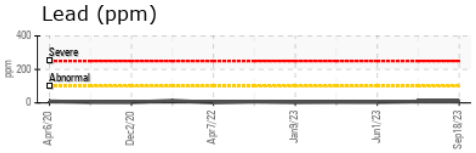
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color			*no image*	*no image*	*no image*
Bottom			*no image*	*no image*	*no image*

GRAPHS

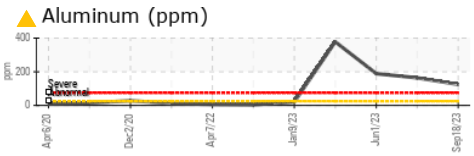
Iron (ppm)



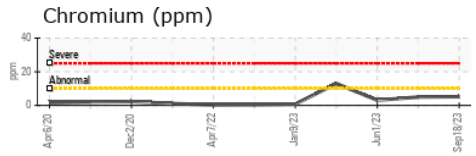
Lead (ppm)



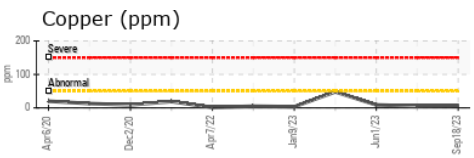
Aluminum (ppm)



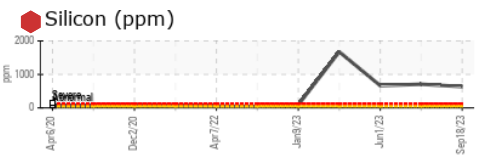
Chromium (ppm)



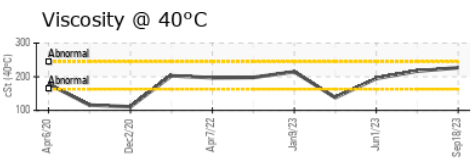
Copper (ppm)



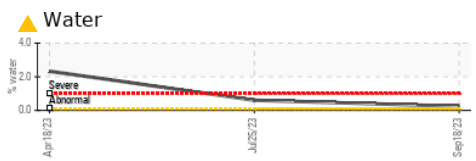
Silicon (ppm)



Viscosity @ 40°C



Water



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : TO10002081 **Received** : 25 Sep 2023
Lab Number : 05960728 **Diagnosed** : 27 Sep 2023
Unique Number : 10661941 **Diagnostician** : Don Baldridge
Test Package : MOB 2 (Additional Tests: KF, 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)

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Submitted By: SKIP SAENGERHAUSEN