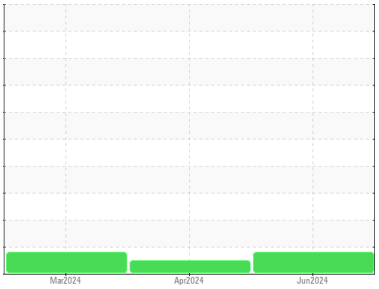
OIL ANALYSIS REPORT

Area
MINING
Machine Id
ME-117 CATERPILLAR 980M KRS00356
Component
Hydraulic System
Fluid
SHELL Spirax S4 CX 10W (--- GAL)

Sample Rating Trend



WEAR

DIAGNOSIS

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

Wear
The iron level is abnormal. All other component wear rates are normal.

Contamination
The amount and size of particulates present in the system are acceptable. 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		**WC0919981**	WC0920009	WC0920003
Sample Date		Client Info		**03 Jun 2024**	01 Apr 2024	11 Mar 2024
Machine Age	hrs	Client Info		**11913**	11592	11464
Oil Age	hrs	Client Info		**250**	100	129
Oil Changed		Client Info		**N/A**	Changed	Filtered
Sample Status				**ABNORMAL**	NORMAL	ABNORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>0.1	**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>20	▲ **29**	10	▲ 24
Chromium	ppm	ASTM D5185m	>10	**<1**	<1	<1
Nickel	ppm	ASTM D5185m	>10	**0**	0	<1
Titanium	ppm	ASTM D5185m		**<1**	<1	0
Silver	ppm	ASTM D5185m		**0**	0	0
Aluminum	ppm	ASTM D5185m	>10	**2**	3	1
Lead	ppm	ASTM D5185m	>10	**<1**	<1	0
Copper	ppm	ASTM D5185m	>75	**3**	<1	2
Tin	ppm	ASTM D5185m	>10	**<1**	<1	0
Vanadium	ppm	ASTM D5185m		**0**	<1	0
Cadmium	ppm	ASTM D5185m		**0**	<1	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**0**	0	0
Barium	ppm	ASTM D5185m		**<1**	0	0
Molybdenum	ppm	ASTM D5185m		**2**	<1	<1
Manganese	ppm	ASTM D5185m		**<1**	0	<1
Magnesium	ppm	ASTM D5185m		**54**	11	57
Calcium	ppm	ASTM D5185m		**186**	46	193
Phosphorus	ppm	ASTM D5185m		**656**	66	762
Zinc	ppm	ASTM D5185m		**881**	404	976
Sulfur	ppm	ASTM D5185m		**1785**	760	2311

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	**4**	1	2
Sodium	ppm	ASTM D5185m		**0**	1	2
Potassium	ppm	ASTM D5185m	>20	**2**	2	<1

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>5000	**535**	418	1806
Particles >6µm		ASTM D7647	>1300	**101**	124	433
Particles >14µm		ASTM D7647	>160	**10**	14	18
Particles >21µm		ASTM D7647	>40	**3**	4	3
Particles >38µm		ASTM D7647	>10	**0**	0	0
Particles >71µm		ASTM D7647	>3	**0**	0	0
Oil Cleanliness		ISO 4406 (c)	>19/17/14	**16/14/10**	16/14/11	18/16/11

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		**0.65**	0.64	0.68

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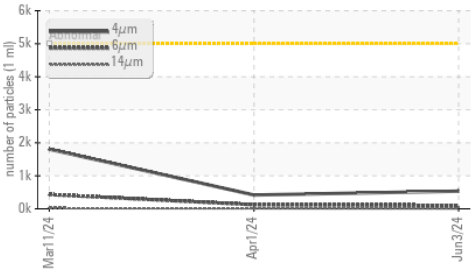
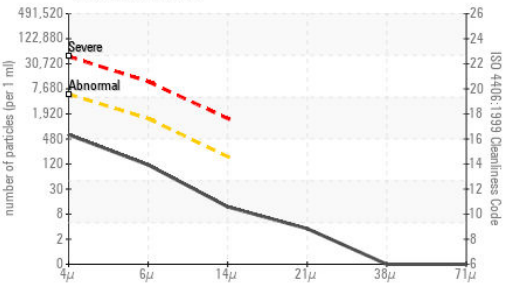
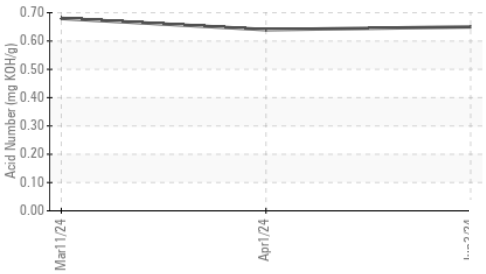
Particle Trend



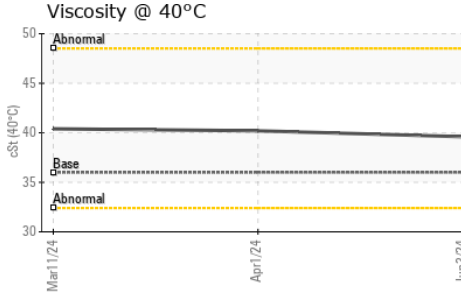
Particle Count



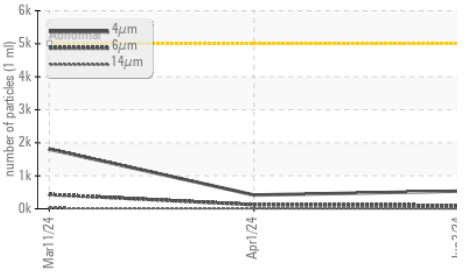
Acid Number



Viscosity @ 40°C

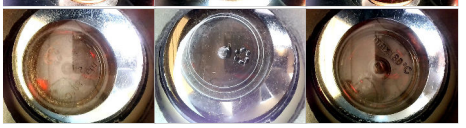


Particle Trend



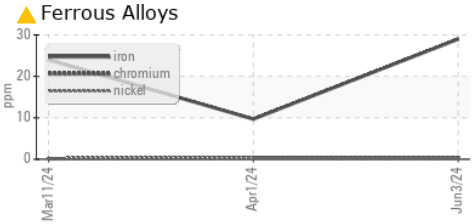
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	36	**39.6**	40.2	40.4

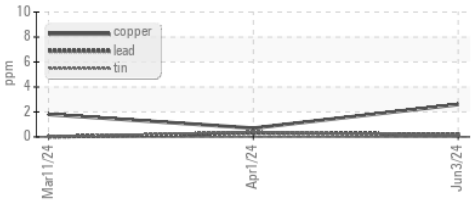
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

GRAPHS

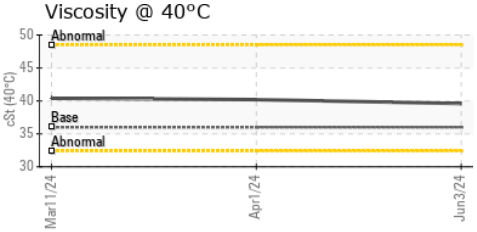
Ferrous Alloys



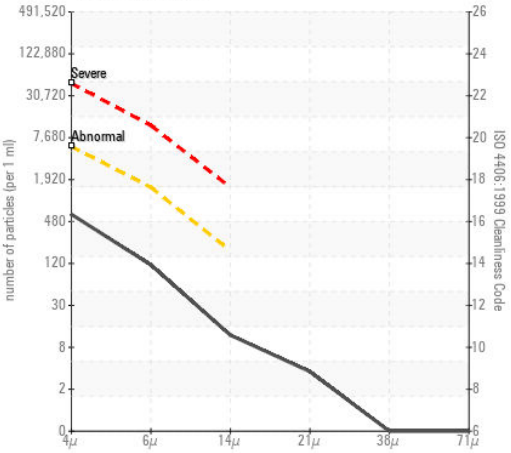
Non-ferrous Metals



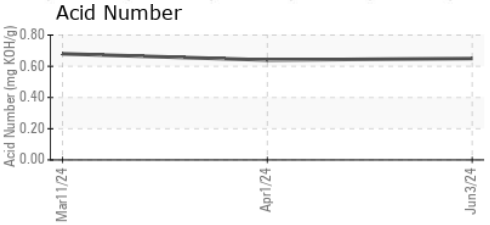
Viscosity @ 40°C



Particle Count



Acid Number



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0919981
Lab Number : 06201468
Unique Number : 11063591
Test Package : CONST

Received : 06 Jun 2024
Tested : 07 Jun 2024
Diagnosed : 09 Jun 2024 - Don Baldridge

Certificate L2367

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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Report Id: COVMEN [WUSCAR] 06201468 (Generated: 06/09/2024 11:52:19) Rev: 1

Submitted By: Megan Mousel