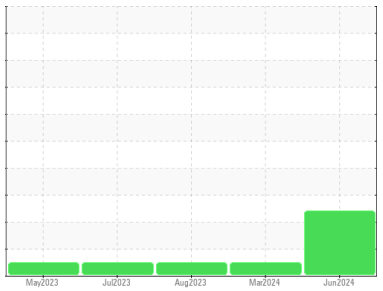
OIL ANALYSIS REPORT

Sample Rating Trend



DIRT

Machine Id
1508 (S/N 3WXDDU9XX7F164995)
Component
Diesel Engine
Fluid
SHELL ROTELLA T 15W40 (--- GAL)

DIAGNOSIS

Recommendation
We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear
The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other component wear rates are normal.

Contamination
Elemental level of silicon (Si) above normal indicating ingress of seal material.

Fluid Condition
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0917134**	WC0878854	WC0822277
Sample Date		Client Info		**17 Jun 2024**	27 Mar 2024	31 Aug 2023
Machine Age	mls	Client Info		**889210**	978116	879606
Oil Age	mls	Client Info		**0**	0	0
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**ABNORMAL**	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>5	**<1.0**	<1.0	<1.0
Water		WC Method	>0.2	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	**54**	59	23
Chromium	ppm	ASTM D5185m	>20	**<1**	2	<1
Nickel	ppm	ASTM D5185m	>4	**<1**	<1	0
Titanium	ppm	ASTM D5185m		**<1**	0	<1
Silver	ppm	ASTM D5185m	>3	**<1**	0	0
Aluminum	ppm	ASTM D5185m	>20	**3**	3	2
Lead	ppm	ASTM D5185m	>40	**15**	2	1
Copper	ppm	ASTM D5185m	>330	▲ **448**	6	2
Tin	ppm	ASTM D5185m	>15	**5**	1	<1
Vanadium	ppm	ASTM D5185m		**0**	<1	<1
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	316	**24**	7	19
Barium	ppm	ASTM D5185m	0.0	**0**	0	0
Molybdenum	ppm	ASTM D5185m	1.2	**37**	50	54
Manganese	ppm	ASTM D5185m		**1**	<1	<1
Magnesium	ppm	ASTM D5185m	24	**394**	673	607
Calcium	ppm	ASTM D5185m	2292	**1882**	1727	1657
Phosphorus	ppm	ASTM D5185m	1064	**1027**	1111	977
Zinc	ppm	ASTM D5185m	1160	**1206**	1366	1236
Sulfur	ppm	ASTM D5185m	4996	**3952**	4195	3662

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	▲ **75**	8	5
Sodium	ppm	ASTM D5185m		**5**	4	5
Potassium	ppm	ASTM D5185m	>20	**5**	6	3

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**0.5**	0.6	0.8
Nitration	Abs/cm	*ASTM D7624	>20	**7.9**	9.1	7.5
Sulfation	Abs/.1mm	*ASTM D7415	>30	**18.2**	20.4	20.1

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**12.9**	15.6	14.7
Base Number (BN)	mg KOH/g	ASTM D2896	10.1	**7.6**	6.7	8.1

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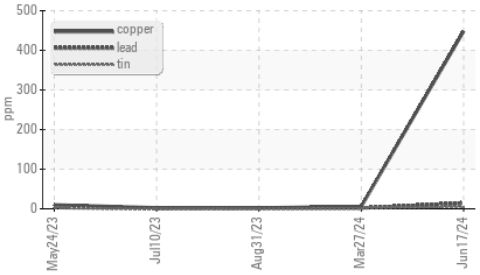
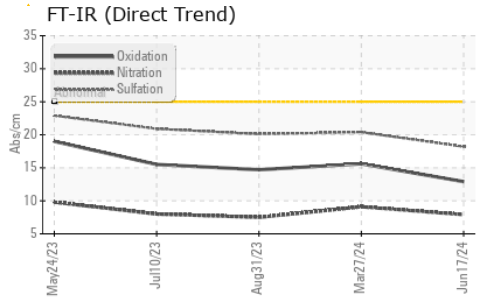
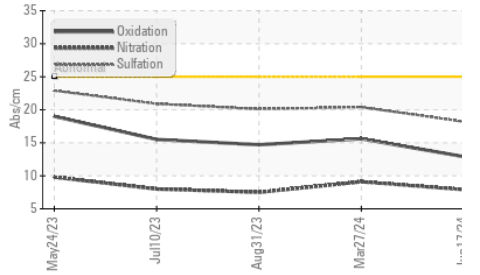
Non-ferrous Metals



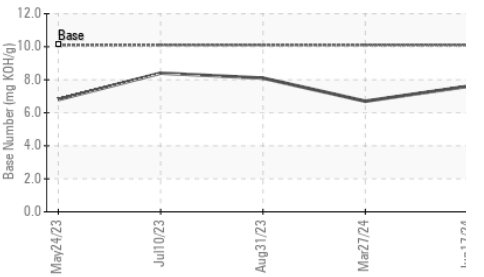
FT-IR (Direct Trend)



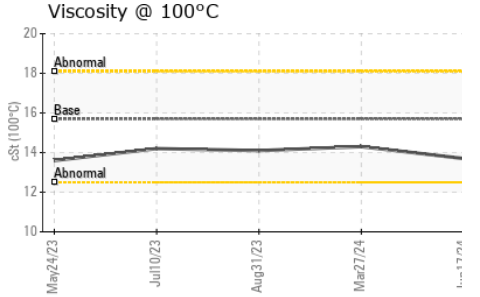
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

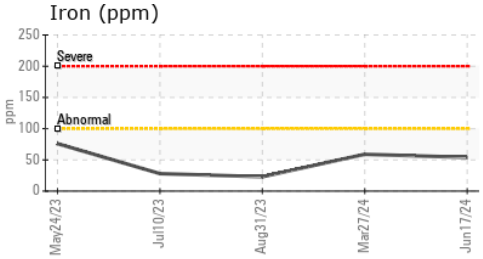


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt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

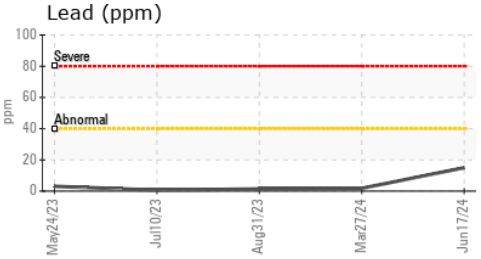
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.7	**13.7**	14.3	14.1

GRAPHS

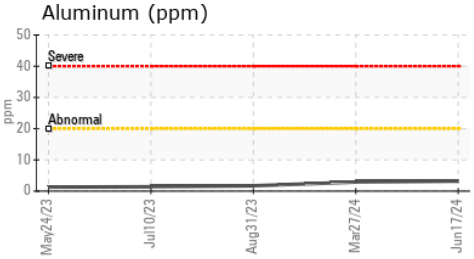
Iron (ppm)



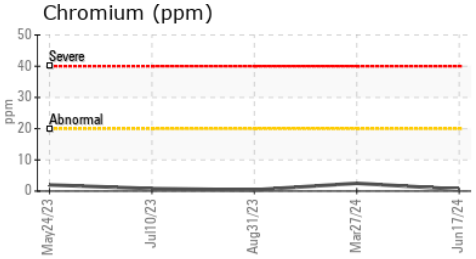
Lead (ppm)



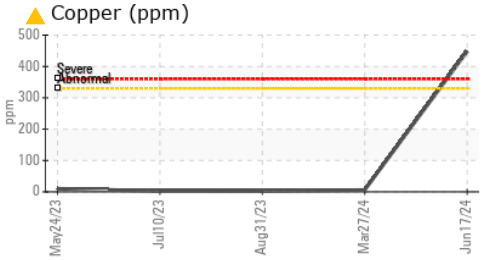
Aluminum (ppm)



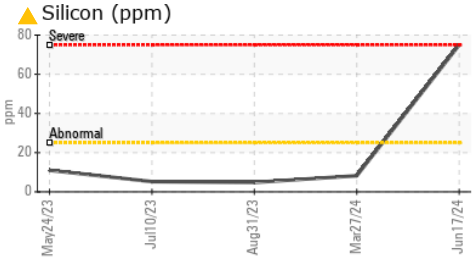
Chromium (ppm)



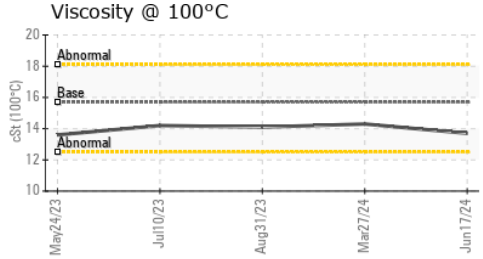
Copper (ppm)



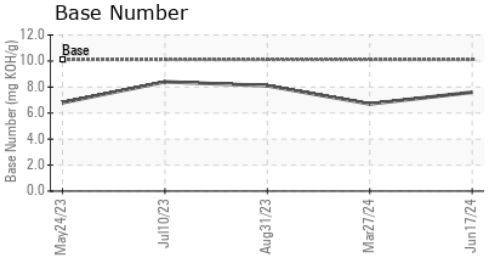
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0917134
Lab Number : 06217546
Unique Number : 11090410
Test Package : MOB 1 (Additional Tests: TBN)

Received : 21 Jun 2024
Tested : 25 Jun 2024
Diagnosed : 25 Jun 2024 - Sean Felton

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: JOHROSNC [WUSCAR] 06217546 (Generated: 06/25/2024 17:57:50) Rev: 1

Contact/Location: GREG JONES - JOHROSNC