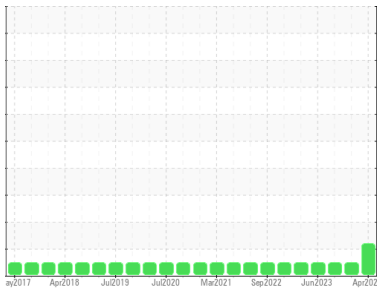
OIL ANALYSIS REPORT

Sample Rating Trend



FUEL

Area
[150780]
Machine Id
CITY OF RALEIGH - SALTBARRO
Component
Diesel Engine
Fluid
DIESEL ENGINE OIL SAE 15W40 (2 GAL)

DIAGNOSIS

Recommendation
The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear
Metal levels are typical for a new component breaking in.

Contamination
There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

Fluid Condition
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0911413**	WC0797332	WC0812701
Sample Date		Client Info		**04 Apr 2024**	14 Dec 2023	12 Sep 2023
Machine Age	hrs	Client Info		**228**	225	224
Oil Age	hrs	Client Info		**0**	0	0
Oil Changed		Client Info		**Changed**	N/A	N/A
Sample Status				**ABNORMAL**	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
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	>250	**0**	0	1
Chromium	ppm	ASTM D5185m	>10	**<1**	0	0
Nickel	ppm	ASTM D5185m	>5	**<1**	0	0
Titanium	ppm	ASTM D5185m		**27**	25	26
Silver	ppm	ASTM D5185m	>3	**0**	0	0
Aluminum	ppm	ASTM D5185m	>35	**2**	2	3
Lead	ppm	ASTM D5185m	>100	**<1**	0	<1
Copper	ppm	ASTM D5185m	>60	**<1**	<1	<1
Tin	ppm	ASTM D5185m	>5	**<1**	0	<1
Vanadium	ppm	ASTM D5185m		**<1**	<1	<1
Cadmium	ppm	ASTM D5185m		**<1**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	250	**112**	101	112
Barium	ppm	ASTM D5185m	10	**0**	0	0
Molybdenum	ppm	ASTM D5185m	100	**49**	46	49
Manganese	ppm	ASTM D5185m		**<1**	0	0
Magnesium	ppm	ASTM D5185m	450	**250**	254	272
Calcium	ppm	ASTM D5185m	3000	**1907**	1794	1951
Phosphorus	ppm	ASTM D5185m	1150	**1080**	1056	1055
Zinc	ppm	ASTM D5185m	1350	**1148**	1210	1280
Sulfur	ppm	ASTM D5185m	4250	**4187**	3911	4216

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>35	**8**	5	5
Sodium	ppm	ASTM D5185m	>158	**<1**	2	1
Potassium	ppm	ASTM D5185m	>20	**3**	<1	2
Fuel	%	ASTM D3524	>5	▲ **5.5**	<1.0	<1.0

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**0.1**	0	0
Nitration	Abs/cm	*ASTM D7624	>20	**7.6**	7.1	7.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	**17.4**	18.0	17.8

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**13.4**	13.6	13.4
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	**8.2**	8.2	8.5

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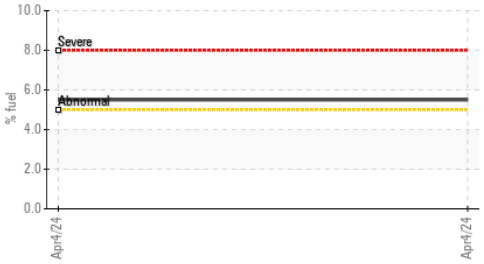
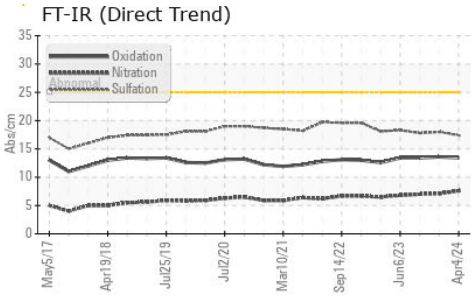
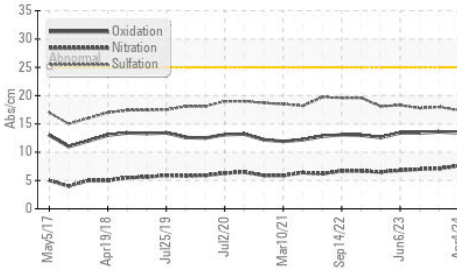
Fuel Dilution



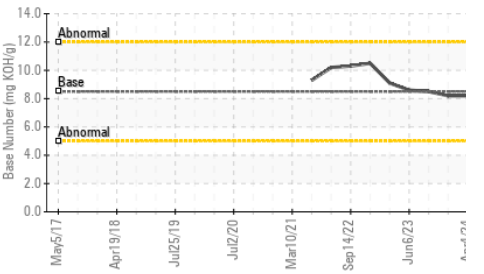
FT-IR (Direct Trend)



FT-IR (Direct Trend)



Base Number

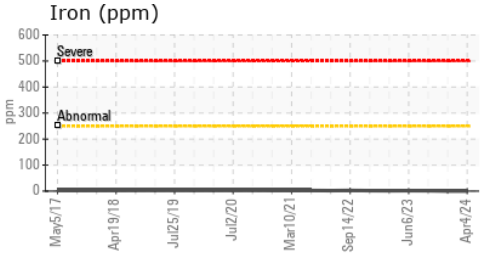


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	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

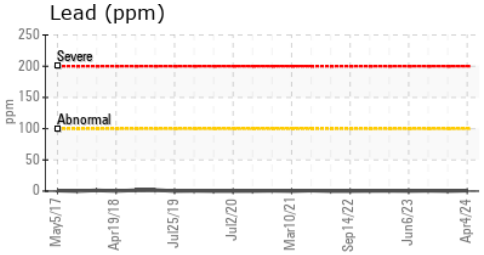
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	▲ **11.9**	14.1	14.2

GRAPHS

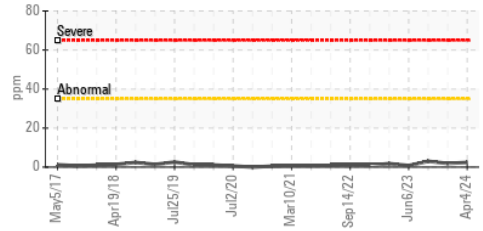
Iron (ppm)



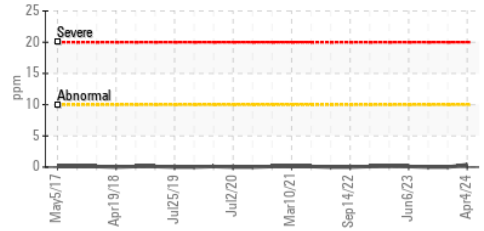
Lead (ppm)



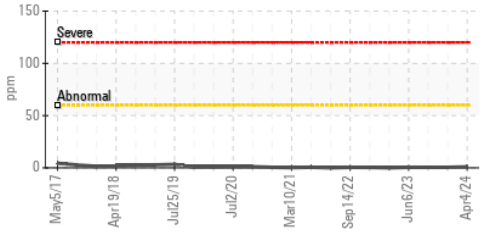
Aluminum (ppm)



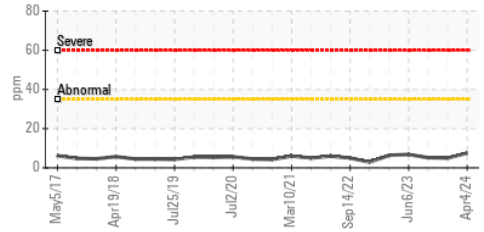
Chromium (ppm)



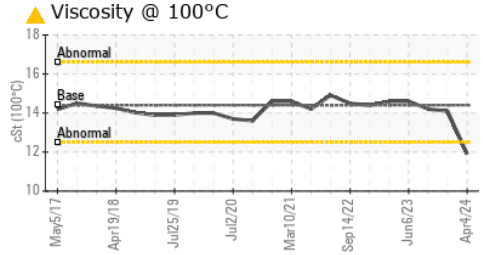
Copper (ppm)



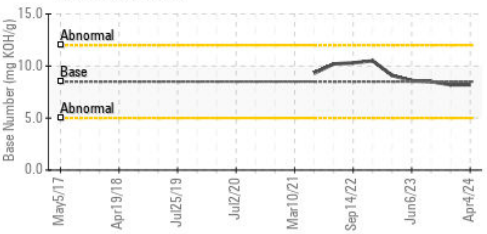
Silicon (ppm)



▲ Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0911413 **Received** : 15 Apr 2024
Lab Number : 06148447 **Tested** : 18 Apr 2024
Unique Number : 10978525 **Diagnosed** : 18 Apr 2024 - Wes Davis
Test Package : MOB 1 (Additional Tests: FuelDilution, PercentFuel, TBN)

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: NATRAL [WUSCAR] 06148447 (Generated: 04/18/2024 19:36:41) Rev: 1
Contact/Location: BRANDON RICE - NATRAL