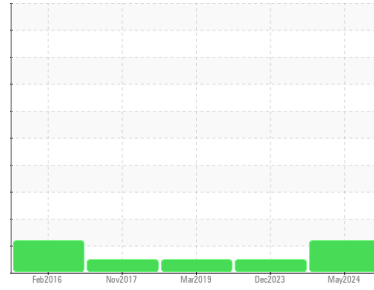




# OIL ANALYSIS REPORT

Sample Rating Trend



## VISUAL METAL



Machine Id

### BLUEBIRD 231

Component

Front Diesel Engine

Fluid

DIESEL ENGINE OIL SAE 15W40 (19 QTS)

### DIAGNOSIS

#### Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

#### Wear

Moderate concentration of visible metal present. All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

#### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

### SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>RW0005663</b>	RW0004491	RWM2275585
Sample Date	Client Info		<b>22 May 2024</b>	06 Dec 2023	01 Mar 2019
Machine Age	mls	Client Info	<b>192000</b>	180097	96000
Oil Age	mls	Client Info	<b>12000</b>	12000	12000
Oil Changed	Client Info		<b>Changed</b>	Changed	Changed
Sample Status			<b>ABNORMAL</b>	NORMAL	NORMAL

### CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>3.0	<b>&lt;1.0</b>	<1.0	<1.0
Water	WC Method	>0.2	<b>NEG</b>	NEG	NEG
Glycol	WC Method		<b>NEG</b>	NEG	NEG

### WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >130	<b>32</b>	36	32
Chromium	ppm	ASTM D5185m >10	<b>1</b>	1	1
Nickel	ppm	ASTM D5185m >4	<b>&lt;1</b>	<1	<1
Titanium	ppm	ASTM D5185m >2	<b>&lt;1</b>	0	<1
Silver	ppm	ASTM D5185m >2	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m >20	<b>7</b>	12	12
Lead	ppm	ASTM D5185m >20	<b>&lt;1</b>	0	0
Copper	ppm	ASTM D5185m >125	<b>2</b>	1	6
Tin	ppm	ASTM D5185m >4	<b>&lt;1</b>	<1	0
Antimony	ppm	ASTM D5185m	<b>---</b>	---	0
Vanadium	ppm	ASTM D5185m	<b>0</b>	0	0
Cadmium	ppm	ASTM D5185m	<b>&lt;1</b>	0	<1

### ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 250	<b>8</b>	8	7
Barium	ppm	ASTM D5185m 10	<b>1</b>	0	0
Molybdenum	ppm	ASTM D5185m 100	<b>63</b>	59	56
Manganese	ppm	ASTM D5185m	<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m 450	<b>926</b>	897	785
Calcium	ppm	ASTM D5185m 3000	<b>1159</b>	1178	1351
Phosphorus	ppm	ASTM D5185m 1150	<b>1144</b>	1077	995
Zinc	ppm	ASTM D5185m 1350	<b>1295</b>	1320	1152
Sulfur	ppm	ASTM D5185m 4250	<b>3206</b>	3084	2608

### CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	<b>5</b>	5	5
Sodium	ppm	ASTM D5185m >158	<b>2</b>	2	3
Potassium	ppm	ASTM D5185m >20	<b>4</b>	10	24

### INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844 >6	<b>0.8</b>	1	0.8
Nitration	Abs/cm	*ASTM D7624 >20	<b>10.5</b>	10.8	8.9
Sulfation	Abs/.1mm	*ASTM D7415 >30	<b>20.1</b>	20.9	19.7

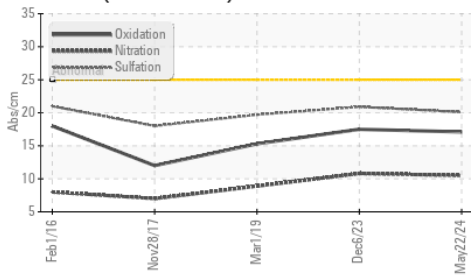
### FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	<b>17.1</b>	17.5	15.3
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	<b>9.73</b>	12.33	8.74

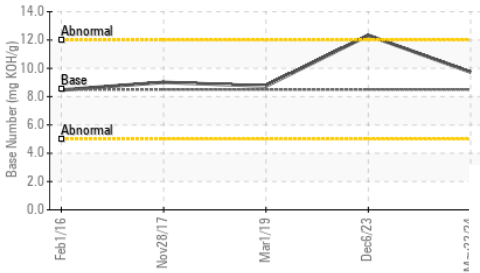


# OIL ANALYSIS REPORT

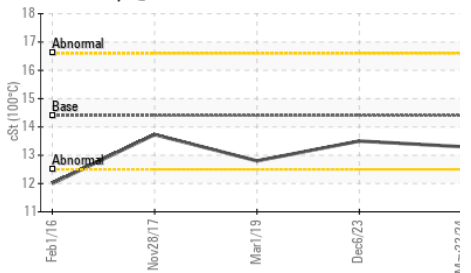
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

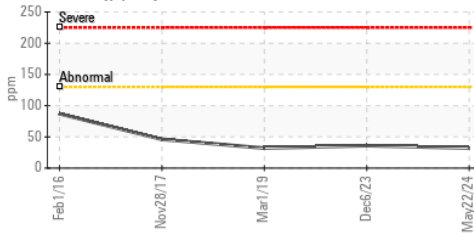


PARAMETER	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	▲ MODER	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance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

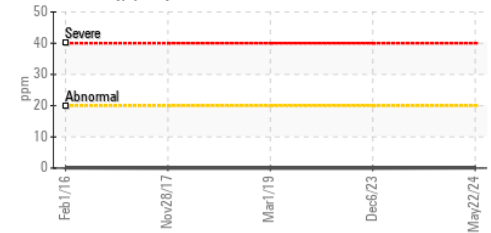
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.3	13.5

GRAPHS

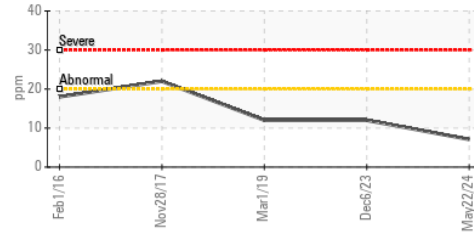
Iron (ppm)



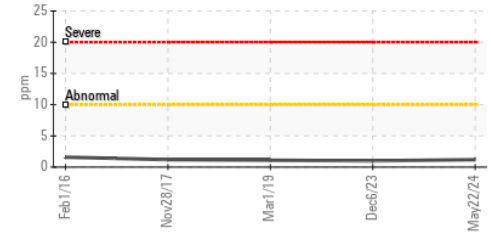
Lead (ppm)



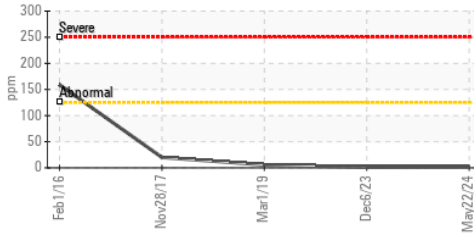
Aluminum (ppm)



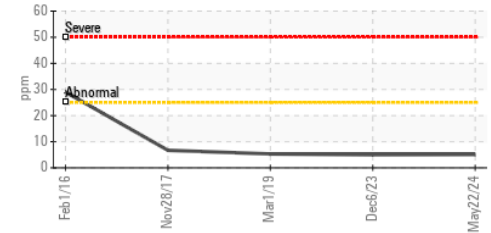
Chromium (ppm)



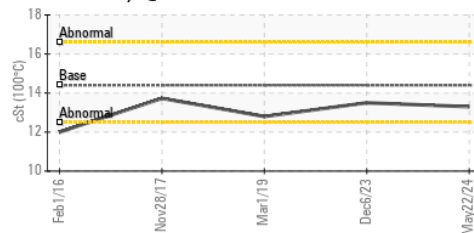
Copper (ppm)



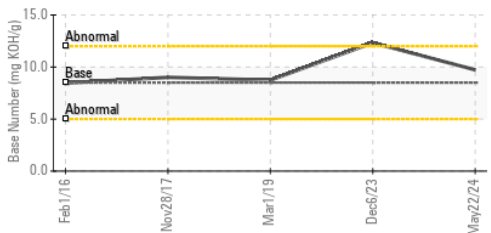
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

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

Sample No. : RW0005663

Lab Number : 06194691

Unique Number : 11056814

Test Package : MOB 2

Received : 29 May 2024

Tested : 31 May 2024

Diagnosed : 31 May 2024 - Don Baldrige

WEST BRANCH/ROSE CITY SCHOOLS

224 THOMAS

WEST BRANCH, MI

US 48661

Contact: BUTCH HART

hartb@wbrc.k12.mi.us

T: (989)343-2240

F: (989)343-2249

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)