



WEAR	<b>ABNORMAL</b>
CONTAMINATION	<b>NORMAL</b>
FLUID CONDITION	<b>NORMAL</b>



Machine Id  
**JOHN DEERE 310E 1DW310EXCMF712160**  
Component  
**Diesel Engine**  
Fluid  
**JOHN DEERE ENGINE OIL PLUS 50 II 15W40 (--- GAL)**

### RECOMMENDATION

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>JR0213031</b>	JR0197731	JR0186089
Sample Date		Client Info		<b>10 May 2024</b>	13 Dec 2023	03 Oct 2023
Machine Age	hrs	Client Info		<b>2469</b>	2017	1610
Oil Age	hrs	Client Info		<b>452</b>	407	570
Filter Age	hrs	Client Info		<b>0</b>	407	570
Oil Changed		Client Info		<b>Changed</b>	Changed	Changed
Filter Changed		Client Info		<b>Changed</b>	Changed	Changed
Sample Status				<b>ABNORMAL</b>	ABNORMAL	ABNORMAL

### WEAR

The nickel level has decreased, but is still abnormal. All other component wear rates are normal.

Iron	ppm	ASTM D5185m	>51	<b>15</b>	25	20
Chromium	ppm	ASTM D5185m	>11	<b>&lt;1</b>	1	<1
Nickel	ppm	ASTM D5185m	>5	<b>▲ 9</b>	▲ 16	▲ 14
Titanium	ppm	ASTM D5185m		<b>0</b>	<1	<1
Silver	ppm	ASTM D5185m	>3	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>31	<b>4</b>	8	7
Lead	ppm	ASTM D5185m	>26	<b>&lt;1</b>	<1	0
Copper	ppm	ASTM D5185m	>26	<b>0</b>	2	2
Tin	ppm	ASTM D5185m	>4	<b>0</b>	<1	0
Vanadium	ppm	ASTM D5185m		<b>0</b>	<1	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

### CONTAMINATION

There is no indication of any contamination in the oil.

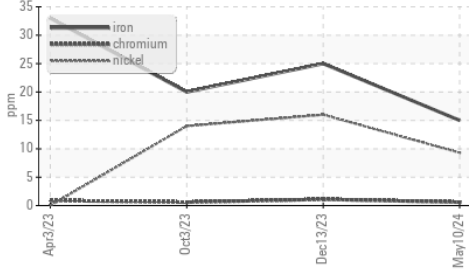
Silicon	ppm	ASTM D5185m	>22	<b>6</b>	11	10
Potassium	ppm	ASTM D5185m	>20	<b>&lt;1</b>	4	1
Fuel		WC Method	>2.1	<b>&lt;1.0</b>	<1.0	<1.0
Water		WC Method	>0.21	<b>NEG</b>	NEG	NEG
Glycol		WC Method		<b>NEG</b>	NEG	NEG
Soot %	%	*ASTM D7844	>3	<b>0.2</b>	0.2	0.2
Nitration	Abs/cm	*ASTM D7624	>20	<b>7.5</b>	7.6	7.7
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>20.6</b>	21.1	21.1
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.21	<b>NEG</b>	NEG	NEG

### FLUID CONDITION

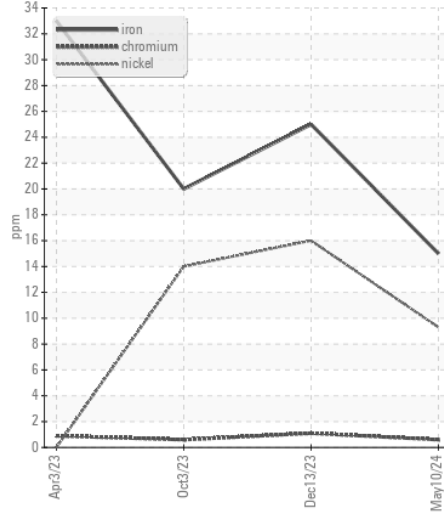
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m	>31	<b>1</b>	1	4
Boron	ppm	ASTM D5185m		<b>261</b>	313	231
Barium	ppm	ASTM D5185m		<b>&lt;1</b>	13	0
Molybdenum	ppm	ASTM D5185m		<b>257</b>	330	251
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	1	<1
Magnesium	ppm	ASTM D5185m		<b>861</b>	1063	885
Calcium	ppm	ASTM D5185m		<b>1511</b>	1720	1459
Phosphorus	ppm	ASTM D5185m		<b>966</b>	1117	934
Zinc	ppm	ASTM D5185m		<b>1145</b>	1362	1143
Sulfur	ppm	ASTM D5185m		<b>3695</b>	4275	3134
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>14.8</b>	15.2	15.1
Base Number (BN)	mg KOH/g	ASTM D2896	13.6	<b>9.0</b>	9.1	9.1
Visc @ 100°C	cSt	ASTM D445	15.4	<b>13.3</b>	13.7	13.3

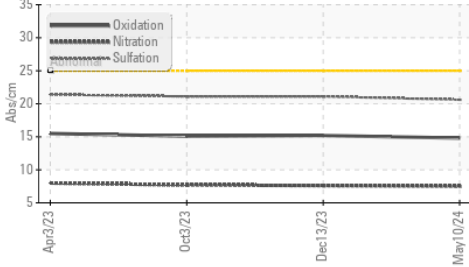
▲ Ferrous Alloys



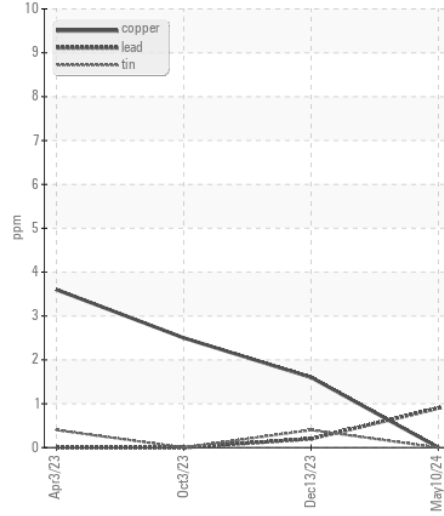
▲ Ferrous Alloys



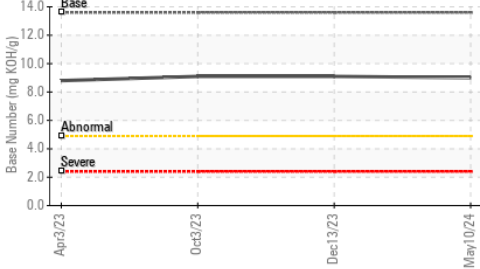
FT-IR (Direct Trend)



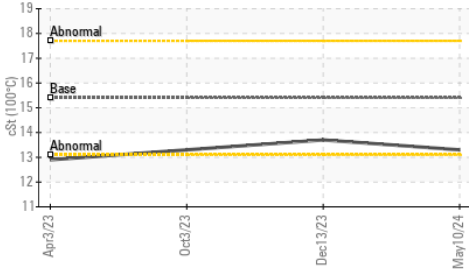
Non-ferrous Metals



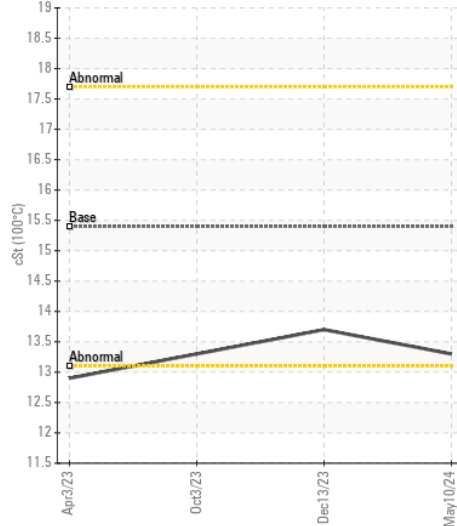
Base Number



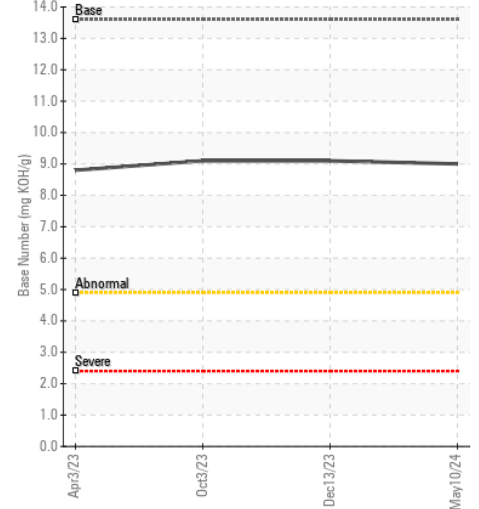
Viscosity @ 100°C



Viscosity @ 100°C



Base Number



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : JR0213031 **Received** : 13 May 2024  
**Lab Number** : 06177012 **Tested** : 14 May 2024  
**Unique Number** : 11023065 **Diagnosed** : 14 May 2024 - Don Baldrige  
**Test Package** : CONST ( Additional Tests: TBN )

**JRE - GARNER**  
 4161 AUBURN CHURCH RD  
 GARNER, NC  
 US 27529

Contact: RALEIGH SHOP  
 sean.betts@jamesriverequipment.com; catherine.anastasio@wearcheck.com

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)

T: (919)614-2260

F: (919)779-5432