

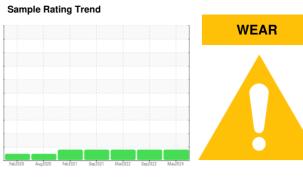
# **OIL ANALYSIS REPORT**



Machine Id **JOHN DEERE 310E 1DW310EXTKF697898** 

Front Differential

JOHN DEERE HY-GARD HYD/TRANS (--- GAL)



## **DIAGNOSIS**

#### Recommendation

The oil 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.

## Wear

Bearing and/or bushing wear is indicated.

### Contamination

There is no indication of any contamination in the

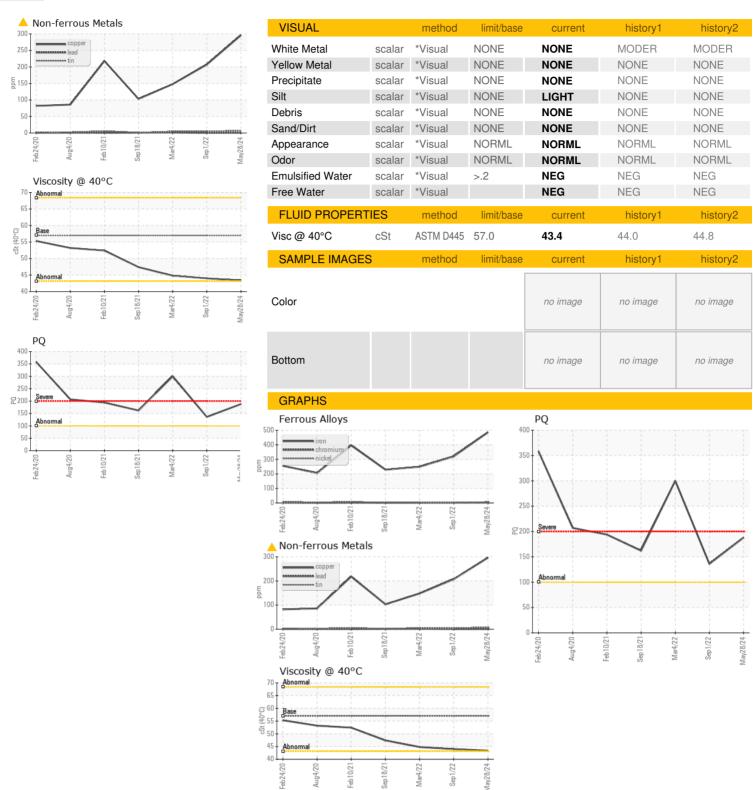
#### **Fluid Condition**

The condition of the oil is acceptable for the time in service.

Machine Age hrs Client Info 4359 3515 2957   Oil Age hrs Client Info 4359 1468 910   Oil Changed Client Info Changed Not Changd Not Changd   Sample Status Banders Current history1 history2   Water WC Method >.2 NEG NEG NEG   WEAR METALS method limit/base current history1 history2   PQ ASTM D8184 188 136 300   Iron ppm ASTM D8185m >500 486 320 249   Chromium ppm ASTM D5185m >10 2 2 1   Nickel ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m >25 1 2 2   Aluminum ppm ASTM D5185m >25 1 2 2   Lead ppm ASTM D5185m	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2	
Machine Age hrs Client Info 4359 3515 2957   Oil Age hrs Client Info 4359 1468 910   Oil Changed Client Info Changed Not Changd Not Changd   Sample Status Method Imilibase Current history1 Net Changd   CONTAMINATION method limil/base current history1 history2   Water WC Method >.2 NEG NEG NEG   WEAR METALS method limil/base current history1 history2   Water WC Method >.2 NEG NEG NEG   WEAR METALS method limil/base current history1 history2   Water WC Method >.2 NEG NEG NEG   WEAR METALS method limil/base current history1 history1   PQ ASTM D5185m >.10 2 2 1 1   Iron ppm<	Sample Number		Client Info		JR0211655	JR0135950	JR0110274	
Oil Age hrs Client Info 4359 1468 910   Oil Changed Sample Status Client Info Changed ABNORMAL Not Changd ABNORMAL Not Changd ABNORMAL   CONTAMINATION method limit/base current history1 history2   WEAR METALS method limit/base current history1 history1 history1 history2   MEG ASTM D5185m colspan="6">current <th colsp<="" td=""><td>Sample Date</td><td></td><td>Client Info</td><td></td><th>28 May 2024</th><td>01 Sep 2022</td><td>04 Mar 2022</td></th>	<td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>28 May 2024</th> <td>01 Sep 2022</td> <td>04 Mar 2022</td>	Sample Date		Client Info		28 May 2024	01 Sep 2022	04 Mar 2022
Oil Changed Sample Status Client Info Changed ABNORMAL Not Changd ABNORMAL Not Changd ABNORMAL   CONTAMINATION method limit/base current history1 history2   Water WC Method >.2 NEG NEG NEG   WEAR METALS method limit/base current history1 history2   PQ ASTM D8184 188 136 300   Iron ppm ASTM D8185m >500 486 320 249   Chromium ppm ASTM D8185m >10 2 2 1   Chromium ppm ASTM D8185m >10 6 3 2   Chromium ppm ASTM D8185m >10 6 3 2   Chromium ppm ASTM D8185m <1 <1 <1 <1   Silver ppm ASTM D8185m <25 1 2 2   Lead ppm ASTM D8185m >25 -1 <1 1	Machine Age	hrs	Client Info		4359	3515	2957	
Sample Status ABNORMAL ABSTOP ASTOP </td <td>Oil Age</td> <td>hrs</td> <td>Client Info</td> <td></td> <th>4359</th> <td>1468</td> <td>910</td>	Oil Age	hrs	Client Info		4359	1468	910	
CONTAMINATION method limit/base current history1 history2   Water WC Method >.2 NEG NEG NEG   WEAR METALS method limit/base current history1 history2   PQ ASTM D8185m 188 136 300   Iron ppm ASTM D5185m >500 486 320 249   Chromium ppm ASTM D5185m >10 2 2 1   Nickel ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m >10 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <td>Oil Changed</td> <td></td> <td>Client Info</td> <td></td> <th>Changed</th> <td>Not Changd</td> <td>Not Changd</td>	Oil Changed		Client Info		Changed	Not Changd	Not Changd	
Water WC Method >.2 NEG NEG NEG   WEAR METALS method limit/base current history1 history2   PQ ASTM D8184 188 136 300   Iron ppm ASTM D5185m >500 486 320 249   Chromium ppm ASTM D5185m >10 6 3 2   Chromium ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m >10 0 <1 1   Silver ppm ASTM D5185m >25 1 2 2   Silver ppm ASTM D5185m >25 -1 <1 <1   Aluminum ppm ASTM D5185m >25 -1 <1 <1 <1   Copper ppm ASTM D5185m >10 7 5 5	Sample Status				ABNORMAL	ABNORMAL	ABNORMAL	
WEAR METALS method limit/base current history1 history2   PQ ASTM D8184 188 136 300   Iron ppm ASTM D5185m >500 486 320 249   Chromium ppm ASTM D5185m >10 2 2 1   Nickel ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m >10 6 3 2   Silver ppm ASTM D5185m >10 0 <1 1   Silver ppm ASTM D5185m >25 1 2 2   Aluminum ppm ASTM D5185m >25 <1 <1 1 1   Copper ppm ASTM D5185m >10 7 5 5 5   Antimony ppm ASTM D5185m >10 7 5 5 5   Vanadium ppm ASTM D5185m 0 0	CONTAMINATION	1	method	limit/base	current	history1	history2	
PQ ASTM D8184 188 136 300   Iron ppm ASTM D5185m >500 486 320 249   Chromium ppm ASTM D5185m >10 2 2 1   Nickel ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m >10 6 3 2   Aluminum ppm ASTM D5185m >10 0 0 <1	Water		WC Method	>.2	NEG	NEG	NEG	
Iron	WEAR METALS		method	limit/base	current	history1	history2	
Chromium ppm ASTM D5185m >10 2 2 1   Nickel ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m >10 6 3 2   Silver ppm ASTM D5185m >10 0 0 <1   Aluminum ppm ASTM D5185m >25 1 2 2   Lead ppm ASTM D5185m >25 <1 <1 1   Copper ppm ASTM D5185m >100 296 207 148   Tin ppm ASTM D5185m >10 7 5 5   Antimony ppm ASTM D5185m >5      Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m <1 0 0 0   ADDITIVES method limit/base current history1	PQ		ASTM D8184		188	136	300	
Nickel ppm ASTM D5185m >10 6 3 2   Titanium ppm ASTM D5185m <1	Iron	ppm	ASTM D5185m	>500	486	320	249	
Titanium ppm ASTM D5185m <1 <1 <1   Silver ppm ASTM D5185m 0 0 <1   Aluminum ppm ASTM D5185m >25 1 2 2   Lead ppm ASTM D5185m >25 <1 <1 1   Copper ppm ASTM D5185m >100 296 207 148   Tin ppm ASTM D5185m >10 7 5 5   Antimony ppm ASTM D5185m >10 7 5 5   Antimony ppm ASTM D5185m 0 0 0 0   Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 12 9 8   Magnesium	Chromium	ppm	ASTM D5185m	>10	2	2	1	
Silver ppm ASTM D5185m 0 0 <1   Aluminum ppm ASTM D5185m >25 1 2 2   Lead ppm ASTM D5185m >25 <1	Nickel	ppm	ASTM D5185m	>10	6	3	2	
Aluminum ppm ASTM D5185m >25 1 2 2   Lead ppm ASTM D5185m >25 <1 <1 1   Copper ppm ASTM D5185m >100 ▲ 296 ▲ 207 ▲ 148   Tin ppm ASTM D5185m >10 7 5 5   Antimony ppm ASTM D5185m >5      Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m  <1 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 <th< td=""><td>Titanium</td><td>ppm</td><td>ASTM D5185m</td><td></td><th>&lt;1</th><td>&lt;1</td><td>&lt;1</td></th<>	Titanium	ppm	ASTM D5185m		<1	<1	<1	
Lead ppm ASTM D5185m >25 <1 <1 1   Copper ppm ASTM D5185m >100 296 ≥207 ▲ 148   Tin ppm ASTM D5185m >10 7 5 5   Antimony ppm ASTM D5185m >5      Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m <1	Silver	ppm	ASTM D5185m		0	0	<1	
Copper ppm ASTM D5185m >100 ▲ 296 ▲ 207 ▲ 148   Tin ppm ASTM D5185m >10 7 5 5   Antimony ppm ASTM D5185m >5      Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Manganese ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356	Aluminum	ppm	ASTM D5185m	>25	1	2	2	
Tin ppm ASTM D5185m >10 7 5 5   Antimony ppm ASTM D5185m >5      Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 c1 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 1290 1103 1089 1049   Phosphorus ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 <td>Lead</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;25</td> <th>&lt;1</th> <td>&lt;1</td> <td>1</td>	Lead	ppm	ASTM D5185m	>25	<1	<1	1	
Antimony ppm ASTM D5185m >5      Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m <1 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Magnesium ppm ASTM D5185m 125 68 55 60   Calcium ppm ASTM D5185m 1290 1103 1089 1049   Phosphorus ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;100</td><th><b>296</b></th><td><b>2</b>07</td><td><u></u> 148</td></t<>	Copper	ppm	ASTM D5185m	>100	<b>296</b>	<b>2</b> 07	<u></u> 148	
Vanadium ppm ASTM D5185m 0 0 0   Cadmium ppm ASTM D5185m <1 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Manganese ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 1290 1103 1089 1049   Phosphorus ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2	Tin	ppm	ASTM D5185m	>10	7	5	5	
Cadmium ppm ASTM D5185m <1 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Manganese ppm ASTM D5185m 122 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2	Antimony	ppm	ASTM D5185m	>5				
ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Manganese ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 <td>Vanadium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td>0</td> <td>0</td>	Vanadium	ppm	ASTM D5185m		0	0	0	
Boron ppm ASTM D5185m 6 61 59 56   Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Manganese ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Cadmium	ppm	ASTM D5185m		<1	0	0	
Barium ppm ASTM D5185m 0 2 0 0   Molybdenum ppm ASTM D5185m 0 4 2 2   Manganese ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	ADDITIVES		method	limit/base	current	history1	history2	
Molybdenum ppm ASTM D5185m 0 4 2 2   Manganese ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Boron	ppm	ASTM D5185m	6	61	59	56	
Manganese ppm ASTM D5185m 12 9 8   Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Barium	ppm	ASTM D5185m	0	2	0	0	
Magnesium ppm ASTM D5185m 145 68 55 60   Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Molybdenum	ppm	ASTM D5185m	0	4	2	2	
Calcium ppm ASTM D5185m 3570 3305 3417 3401   Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Manganese	ppm	ASTM D5185m		12	9	8	
Phosphorus ppm ASTM D5185m 1290 1103 1089 1049   Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Magnesium	ppm	ASTM D5185m	145	68	55	60	
Zinc ppm ASTM D5185m 1640 1302 1334 1246   Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Calcium	ppm	ASTM D5185m	3570	3305	3417	3401	
Sulfur ppm ASTM D5185m 3384 3356 2726   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Phosphorus	ppm	ASTM D5185m	1290	1103	1089	1049	
CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Zinc	ppm	ASTM D5185m	1640	1302	1334	1246	
Silicon ppm ASTM D5185m >75 15 12 12   Sodium ppm ASTM D5185m 3 3 0	Sulfur	ppm	ASTM D5185m		3384	3356	2726	
Sodium ppm ASTM D5185m 3 3 0	CONTAMINANTS		method	limit/base	current	history1	history2	
Sodium ppm ASTM D5185m 3 0	Silicon	ppm	ASTM D5185m	>75	15	12	12	
Potassium ppm ASTM D5185m >20 <b>2</b> 2 0	Sodium	• •	ASTM D5185m		3	3	0	
	Potassium	ppm	ASTM D5185m	>20	2	2	0	



## OIL ANALYSIS REPORT







Certificate 12367

Sample No.

Lab Number : 06194709 Unique Number : 11056832

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : JR0211655

Received **Tested** Diagnosed Test Package : CONST ( Additional Tests: PQ )

: 29 May 2024 : 31 May 2024

: 31 May 2024 - Don Baldridge

11047 LEADBETTER RD ASHLAND, VA US 23005

JRE - ASHLAND

Contact: DAVID ZIEG dzieg@jamesriverequipment.com

T: (804)798-6001 F: (804)798-0292

To discuss this sample report, contact Customer Service at 1-800-237-1369.  $^st$  - 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)