

PROBLEM SUMMARY

Sample Rating Trend

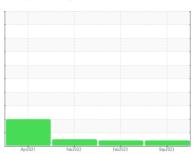
VISCOSITY



Area [W46858] **JOHN DEERE 410E 1DW410EBAMF709228** Component

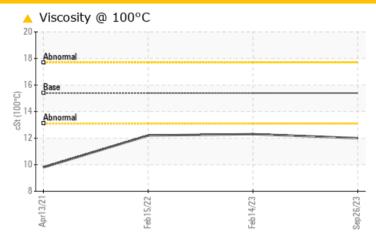
Diesel Engine

JOHN DEERE ENGINE OIL PLUS 50 II 15W40 (--- GAL)





COMPONENT CONDITION SUMMARY



RECOMMENDATION

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

| PROBLEMATIC T | EST RE | SULTS | | | | |
|---------------|--------|-----------|------|-------------|---------------|--------|
| Sample Status | | | | ATTENTION | ATTENTION | NORMAL |
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | 12.0 | <u>▲</u> 12.3 | 12.2 |

Customer Id: JAMASH **Sample No.:** JR0179214 Lab Number: 05967594 Test Package: CONST



To manage this report scan the QR code

To discuss the diagnosis or test data:

Don Baldridge +1 don.b505@comcast.net

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---------------|--------|------|---------|---|
| Change Fluid | | | ? | Oil and filter change at the time of sampling has been noted. |
| Change Filter | | | ? | Oil and filter change at the time of sampling has been noted. |

HISTORICAL DIAGNOSIS

14 Feb 2023 Diag: Jonathan Hester

VISCOSITY



Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.



15 Feb 2022 Diag: Jonathan Hester

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

view report

13 Apr 2021 Diag: Jonathan Hester

WEAR



Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. 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 metal levels are typical for a new component breaking in. Light fuel dilution occurring. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.





OIL ANALYSIS REPORT

Sample Rating Trend

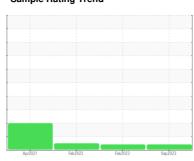
VISCOSITY



[W46858] Machine Id JOHN DEERE 410E 1DW410EBAMF709228

Diesel Engine

JOHN DEERE ENGINE OIL PLUS 50 II 15W40 (--- GAL)





DIAGNOSIS

Recommendation

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

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

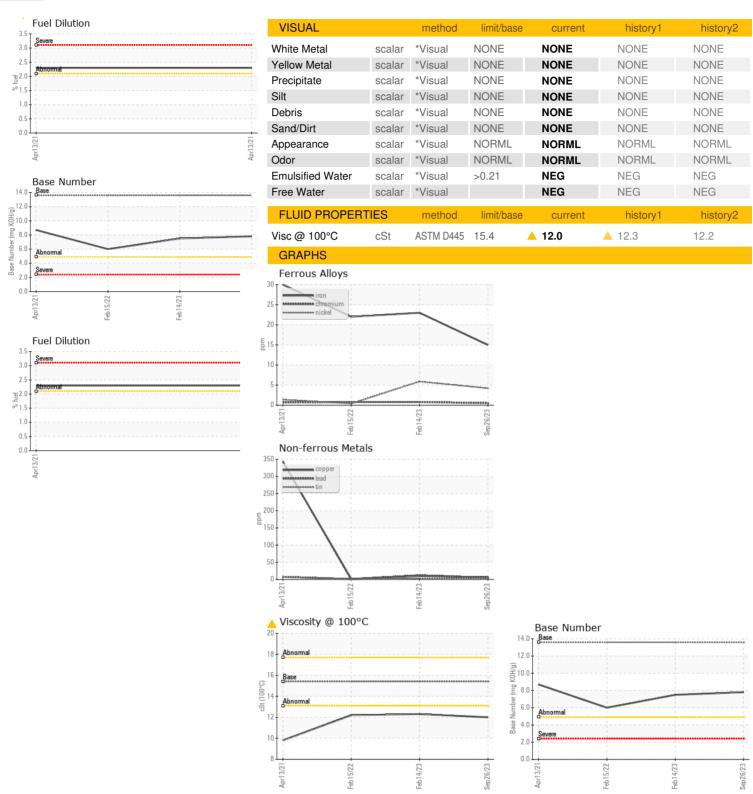
Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

| SAMPLE INFORMATION method limit/base current history1 history2 | -LOS 50 II 154440 (· | , | Apr202 | Feb2022 | Feb 2023 Se | ep2023 | |
|--|--|--|--|---|--|---|--|
| Client Info | SAMPLE INFORM | MATION | method | limit/base | current | history1 | history2 |
| Machine Age hrs Client Info 4970 4465 2380 Oil Age hrs Client Info 0 0 861 Oil Oil Changed Changea Changed Changea Changea < | Sample Number | | Client Info | | JR0179214 | JR0147940 | JR0084913 |
| Oil Changed | Sample Date | | Client Info | | 26 Sep 2023 | 14 Feb 2023 | 15 Feb 2022 |
| Contamination | Machine Age | hrs | Client Info | | 4970 | 4465 | 2380 |
| CONTAMINATION method limit/base current history1 history2 | Oil Age | hrs | Client Info | | 0 | 0 | 861 |
| CONTAMINATION method imil/base current history1 history2 | Oil Changed | | Client Info | | Changed | Changed | Changed |
| WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >51 15 23 22 Chromium ppm ASTM D5185m >51 15 23 22 Chromium ppm ASTM D5185m >5 4 6 <1 | - | | | | _ | ATTENTION | NORMAL |
| WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >51 15 23 22 Chromium ppm ASTM D5185m >11 <1 | CONTAMINATION | N | method | limit/base | current | history1 | history2 |
| Concording Con | Glycol | | WC Method | | NEG | NEG | NEG |
| Chromium | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Nickel | ron | ppm | ASTM D5185m | >51 | 15 | 23 | 22 |
| Nickel | Chromium | ppm | ASTM D5185m | >11 | <1 | <1 | <1 |
| Silver | Nickel | | ASTM D5185m | >5 | 4 | 6 | <1 |
| Silver | Titanium | | ASTM D5185m | | <1 | 0 | <1 |
| Aluminum | Silver | | | >3 | 0 | 0 | 0 |
| Lead | Aluminum | | ASTM D5185m | | | 5 | 7 |
| Copper ppm ASTM D5185m >26 6 10 1 Tin ppm ASTM D5185m >4 2 3 <1 | Lead | | ASTM D5185m | >26 | 5 | | <1 |
| Antimony | Copper | | ASTM D5185m | >26 | | 10 | 1 |
| Antimony | | | | | 2 | 3 | <1 |
| Vanadium ppm ASTM D5185m <1 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 146 101 23 Barium ppm ASTM D5185m 0 <1 0 Molybdenum ppm ASTM D5185m 240 230 31 Manganese ppm ASTM D5185m 1 1 <1 <1 Magnesium ppm ASTM D5185m 804 777 176 Calcium ppm ASTM D5185m 1408 1376 2528 Phosphorus ppm ASTM D5185m 799 757 1069 Zinc ppm ASTM D5185m 2992 3353 3185 CONTAMINANTS method limit/base current history1 history2 Silicon ppm | Antimony | | ASTM D5185m | | | | <1 |
| Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 146 101 23 Barium ppm ASTM D5185m 0 <1 | • | | ASTM D5185m | | <1 | <1 | |
| Boron | Cadmium | | ASTM D5185m | | 0 | 0 | 0 |
| Barium | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 240 230 31 Manganese ppm ASTM D5185m 1 1 <1 | Boron | ppm | ASTM D5185m | | 146 | 101 | 23 |
| Manganese ppm ASTM D5185m 1 1 <1 <1 Magnesium ppm ASTM D5185m 804 777 176 Calcium ppm ASTM D5185m 1408 1376 2528 Phosphorus ppm ASTM D5185m 799 757 1069 Zinc ppm ASTM D5185m 1002 994 1257 Sulfur ppm ASTM D5185m 2992 3353 3185 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 8 6 5 Sodium ppm ASTM D5185m >31 4 4 2 Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D5185m >20 0 1 7 Fuel % ASTM D5185m >20 0 1 7 Fuel | Barium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Magnesium ppm ASTM D5185m 804 777 176 Calcium ppm ASTM D5185m 1408 1376 2528 Phosphorus ppm ASTM D5185m 799 757 1069 Zinc ppm ASTM D5185m 1002 994 1257 Sulfur ppm ASTM D5185m 2992 3353 3185 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 8 6 5 Sodium ppm ASTM D5185m >31 4 4 2 Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D3524 >2.1 <1.0 | Malyhdanim | | | | | | |
| Calcium ppm ASTM D5185m 1408 1376 2528 Phosphorus ppm ASTM D5185m 799 757 1069 Zinc ppm ASTM D5185m 1002 994 1257 Sulfur ppm ASTM D5185m 2992 3353 3185 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 8 6 5 Sodium ppm ASTM D5185m >31 4 4 2 Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D3524 >2.1 <1.0 | violybaerium | ppm | ASTM D5185m | | 240 | 230 | 31 |
| Phosphorus ppm ASTM D5185m 799 757 1069 Zinc ppm ASTM D5185m 1002 994 1257 Sulfur ppm ASTM D5185m 2992 3353 3185 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 8 6 5 Sodium ppm ASTM D5185m >31 4 4 2 Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D5185m >20 0 0 1 0 1 <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> | | | | | - | | |
| Time | Manganese | ppm | ASTM D5185m | | 1 | 1 | <1 |
| Sulfur ppm ASTM D5185m 2992 3353 3185 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 8 6 5 Sodium ppm ASTM D5185m >31 4 4 2 Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D3524 >2.1 <1.0 | Manganese Magnesium | ppm | ASTM D5185m ASTM D5185m | | 1 804 | 1 777 | <1 176 |
| CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 8 6 5 Sodium ppm ASTM D5185m >31 4 4 2 Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D3524 >2.1 <1.0 | Manganese Magnesium Calcium | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | | 1 804 1408 | 1 777 1376 | <1 176 2528 |
| Silicon ppm ASTM D5185m >22 8 6 5 Sodium ppm ASTM D5185m >31 4 4 2 Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D3524 >2.1 <1.0 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 9.6 10.7 12.2 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 24.8 27.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 20.2 20.7 | Manganese Magnesium Calcium Phosphorus | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | | 1 804 1408 799 | 1 777 1376 757 | <1 176 2528 1069 |
| Sodium | Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | | 1 804 1408 799 1002 | 1 777 1376 757 994 | <1 176 2528 1069 1257 |
| Potassium ppm ASTM D5185m >20 0 1 7 Fuel % ASTM D3524 >2.1 <1.0 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 9.6 10.7 12.2 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 24.8 27.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 20.2 20.7 | Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 1 804 1408 799 1002 2992 | 1 777 1376 757 994 3353 | <1 176 2528 1069 1257 3185 |
| Fuel % ASTM D3524 >2.1 <1.0 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 9.6 10.7 12.2 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 24.8 27.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 20.2 20.7 | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | | 1 804 1408 799 1002 2992 current | 1 777 1376 757 994 3353 history1 | <1 176 2528 1069 1257 3185 history2 |
| INFRA-RED | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | >22 | 1 804 1408 799 1002 2992 current 8 | 1 777 1376 757 994 3353 history1 | <1 176 2528 1069 1257 3185 history2 |
| Soot % % *ASTM D7844 >3 0.3 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 9.6 10.7 12.2 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 24.8 27.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 20.2 20.7 | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m | >22 >31 | 1 804 1408 799 1002 2992 current 8 4 | 1 777 1376 757 994 3353 history1 6 4 | <1 176 2528 1069 1257 3185 history2 5 |
| Nitration Abs/cm *ASTM D7624 >20 9.6 10.7 12.2 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 24.8 27.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 20.2 20.7 | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | >22 >31 >20 | 1 804 1408 799 1002 2992 current 8 4 | 1 777 1376 757 994 3353 history1 6 4 1 | <1 176 2528 1069 1257 3185 history2 5 2 |
| Nitration Abs/cm *ASTM D7624 >20 9.6 10.7 12.2 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 24.8 27.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 20.2 20.7 | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m | >22 >31 >20 >2.1 | 1 804 1408 799 1002 2992 current 8 4 0 <1.0 | 1 777 1376 757 994 3353 history1 6 4 1 <<1.0 | <1 176 2528 1069 1257 3185 history2 5 2 7 <1.0 |
| Sulfation Abs/.1mm *ASTM D7415 >30 22.5 24.8 27.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.6 20.2 20.7 | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D3524 | >22 >31 >20 >2.1 limit/base | 1 804 1408 799 1002 2992 current 8 4 0 <1.0 | 1 777 1376 757 994 3353 history1 6 4 1 <1.0 history1 | <1 176 2528 1069 1257 3185 history2 5 2 7 <1.0 history2 |
| Oxidation | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D3524 method *ASTM D7844 | >22 >31 >20 >2.1 limit/base >3 | 1 804 1408 799 1002 2992 current 8 4 0 <1.0 current | 1 777 1376 757 994 3353 history1 6 4 1 <1.0 history1 0.4 | <1 176 2528 1069 1257 3185 history2 5 2 7 <1.0 history2 0.6 |
| | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D7824 method *ASTM D7844 *ASTM D7624 | >22 >31 >20 >2.1 limit/base >3 >20 | 1 804 1408 799 1002 2992 current 8 4 0 <1.0 current 0.3 9.6 | 1 777 1376 757 994 3353 history1 6 4 1 <1.0 history1 0.4 10.7 | <1 176 2528 1069 1257 3185 history2 5 2 7 <1.0 history2 0.6 12.2 |
| | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7614 | >22 >31 >20 >2.1 limit/base >3 >20 >30 | 1 804 1408 799 1002 2992 current 8 4 0 <1.0 current 0.3 9.6 22.5 | 1 777 1376 757 994 3353 history1 6 4 1 <1.0 history1 0.4 10.7 24.8 | <1 176 2528 1069 1257 3185 history2 5 2 7 <1.0 history2 0.6 12.2 27.3 |
| | Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA | ppm | ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D7415 method | >22 >31 >20 >2.1 limit/base >3 >20 >30 limit/base | 1 804 1408 799 1002 2992 current 8 4 0 <1.0 current 0.3 9.6 22.5 | 1 777 1376 757 994 3353 history1 6 4 1 <1.0 history1 0.4 10.7 24.8 history1 | <1 176 2528 1069 1257 3185 history2 5 2 7 <1.0 history2 0.6 12.2 27.3 history2 |



OIL ANALYSIS REPORT







Laboratory Sample No. Lab Number **Unique Number**

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : JR0179214 : 05967594

: 10674145

Received : 03 Oct 2023 Diagnosed

: 05 Oct 2023 Diagnostician : Don Baldridge

Test Package : CONST (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)

Contact: DAVID ZIEG dzieg@jamesriverequipment.com

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

11047 LEADBETTER RD

Report Id: JAMASH [WUSCAR] 05967594 (Generated: 10/05/2023 15:03:57) Rev: 1

JRE - ASHLAND

ASHLAND, VA US 23005