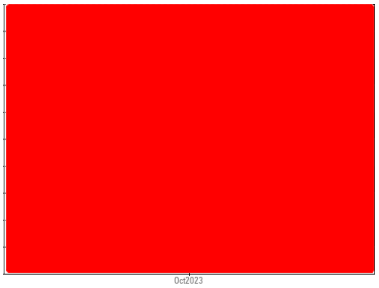
PROBLEM SUMMARY

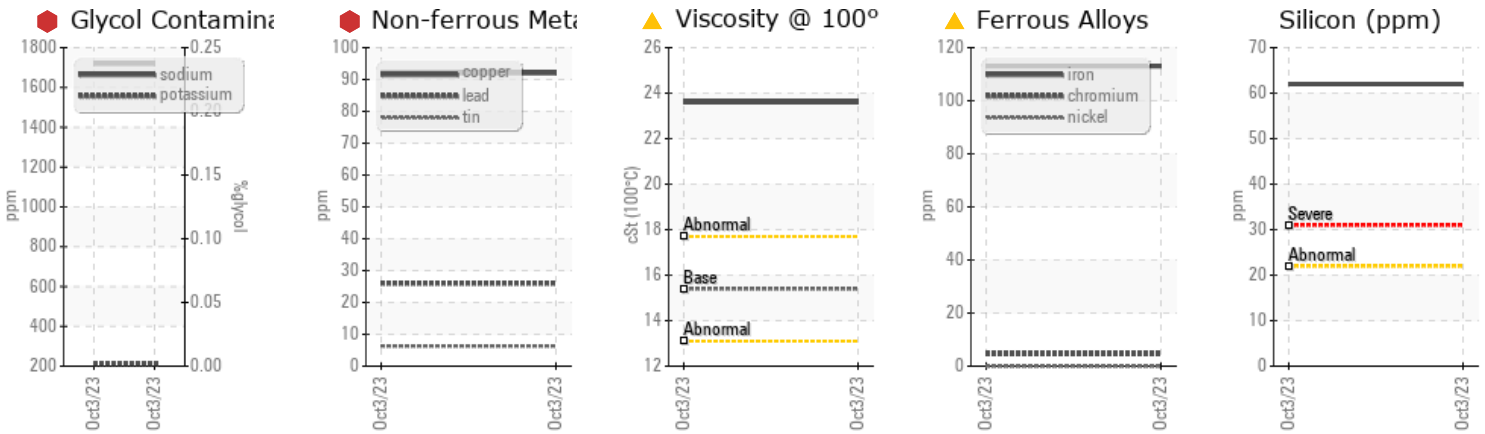
Sample Rating Trend



GLYCOL

Machine Id
JOHN DEERE JOHN DEERE 9230
Component
Right Diesel Engine
Fluid
JOHN DEERE ENGINE OIL PLUS 50 II 15W40 (28 LTR)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you check for the source of the coolant leak. We advise that you monitor for an abnormal oil pressure drop and noise. We recommend that you drain the oil from the component if this has not already been done. We advise that you flush the component thoroughly before re-filling with oil. We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS

Sample Status				**SEVERE**	---	---
Iron	ppm	ASTM D5185(m)	>51	▲ **113**	---	---
Lead	ppm	ASTM D5185(m)	>26	▲ **26**	---	---
Copper	ppm	ASTM D5185(m)	>26	▲ **92**	---	---
Tin	ppm	ASTM D5185(m)	>4	● **6**	---	---
Ferrous Rubbing	Scale 0-10	ASTM D7684*		▲ **7**		
Sodium	ppm	ASTM D5185(m)	>31	▲ **1719**	---	---
Potassium	ppm	ASTM D5185(m)	>20	▲ **213**	---	---
Glycol	%	ASTM D7922*		● **>.70**	---	---
Visc @ 100°C	cSt	ASTM D7279(m)	15.4	▲ **23.6**	---	---

Customer Id: GRE116CAR
Sample No.: PP
Lab Number: 02588244
Test Package: MOB 3

To manage this report scan the QR code

To discuss the diagnosis or test data:
Kevin Marson +1 (289)291-4644 x4644
Kevin.Marson@wearcheck.com

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

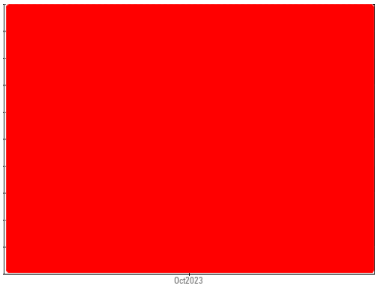
RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Monitor	---	---	?	We advise that you monitor for an abnormal oil pressure drop and noise.
Change Fluid	---	---	?	We recommend that you drain the oil from the component if this has not already been done.
Flush System	---	---	?	We advise that you flush the component thoroughly before re-filling with oil.
Change Filter	---	---	?	We recommend you service the filters on this component.
Resample	---	---	?	We recommend an early resample to monitor this condition.
Check Glycol Access	---	---	?	We advise that you check for the source of the coolant leak.

HISTORICAL DIAGNOSIS

OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL

Machine Id
JOHN DEERE JOHN DEERE 9230
Component
Right Diesel Engine
Fluid
JOHN DEERE ENGINE OIL PLUS 50 II 15W40 (28 LTR)

DIAGNOSIS

Recommendation

We advise that you check for the source of the coolant leak. We advise that you monitor for an abnormal oil pressure drop and noise. We recommend that you drain the oil from the component if this has not already been done. We advise that you flush the component thoroughly before re-filling with oil. We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

Wear

We have assumed that the oil was taken hot, according to the sampling instructions. Large Particles and severity index levels are severe. Tin ppm levels are severe. Total Particles levels are abnormal. Iron and copper and lead ppm levels are abnormal. Wear particle analysis indicates that the ferrous rubbing particles are abnormal. Cylinder, crank, or cam shaft wear is indicated. Bearing wear is indicated. Slide bearing wear is indicated.

Contaminants

Test for glycol is positive. There is a high concentration of glycol present in the oil.

Oil Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Viscosity of sample indicates oil is within SAE 60 range, advise investigate. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**PP**	---	---
Sample Date		Client Info		**03 Oct 2023**	---	---
Machine Age	hrs	Client Info		**5000**	---	---
Oil Age	hrs	Client Info		**100**	---	---
Oil Changed		Client Info		**N/A**	---	---
Sample Status				**SEVERE**	---	---

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>2.1	**<1.0**	---	---

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*	>50	**33**	---	---
Iron	ppm	ASTM D5185(m)	>51	▲ **113**	---	---
Chromium	ppm	ASTM D5185(m)	>11	**5**	---	---
Nickel	ppm	ASTM D5185(m)	>5	**0**	---	---
Titanium	ppm	ASTM D5185(m)		**<1**	---	---
Silver	ppm	ASTM D5185(m)	>3	**<1**	---	---
Aluminum	ppm	ASTM D5185(m)	>31	**25**	---	---
Lead	ppm	ASTM D5185(m)	>26	▲ **26**	---	---
Copper	ppm	ASTM D5185(m)	>26	▲ **92**	---	---
Tin	ppm	ASTM D5185(m)	>4	⬢ **6**	---	---
Antimony	ppm	ASTM D5185(m)		**0**	---	---
Vanadium	ppm	ASTM D5185(m)		**0**	---	---
Beryllium	ppm	ASTM D5185(m)		**0**	---	---
Cadmium	ppm	ASTM D5185(m)		**0**	---	---

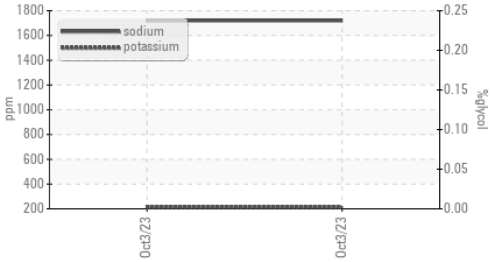
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)		**271**	---	---
Barium	ppm	ASTM D5185(m)		**<1**	---	---
Molybdenum	ppm	ASTM D5185(m)		**291**	---	---
Manganese	ppm	ASTM D5185(m)		**<1**	---	---
Magnesium	ppm	ASTM D5185(m)		**722**	---	---
Calcium	ppm	ASTM D5185(m)		**1148**	---	---
Phosphorus	ppm	ASTM D5185(m)		**777**	---	---
Zinc	ppm	ASTM D5185(m)		**885**	---	---
Sulfur	ppm	ASTM D5185(m)		**2098**	---	---
Lithium	ppm	ASTM D5185(m)		**<1**	---	---

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>22	**62**	---	---
Sodium	ppm	ASTM D5185(m)	>31	▲ **1719**	---	---
Potassium	ppm	ASTM D5185(m)	>20	▲ **213**	---	---
Glycol	%	ASTM D7922*		⬢ **>.70**	---	---

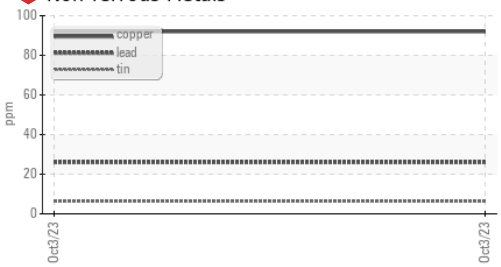
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	ASTM D7844*	>3	**0.4**	---	---
Nitration	Abs/cm	ASTM D7624*	>20	**11.4**	---	---
Sulfation	Abs/.1mm	ASTM D7415*	>30	**17.4**	---	---

OIL ANALYSIS REPORT

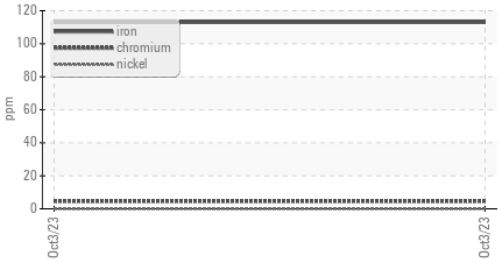
Glycol Contamination



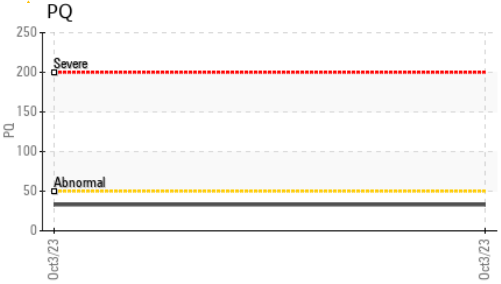
Non-ferrous Metals



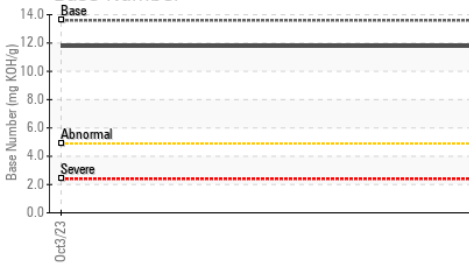
Ferrous Alloys



PQ



Base Number



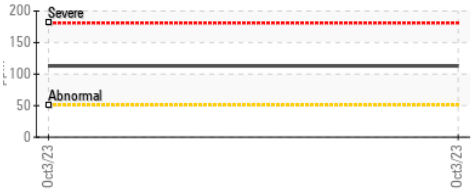
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	ASTM D7414*	>25	**13.3**	---	---
Base Number (BN)	mg KOH/g	ASTM D2896*	13.6	**11.78**	---	---

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	**VLITE**	---	---
Yellow Metal	scalar	Visual*	NONE	**NONE**	---	---
Precipitate	scalar	Visual*	NONE	**NONE**	---	---
Silt	scalar	Visual*	NONE	**VLITE**	---	---
Debris	scalar	Visual*	NONE	**NONE**	---	---
Sand/Dirt	scalar	Visual*	NONE	**NONE**	---	---
Appearance	scalar	Visual*	NORML	**NORML**	---	---
Odor	scalar	Visual*	NORML	**NORML**	---	---
Emulsified Water	scalar	Visual*	>0.21	**NEG**	---	---
Free Water	scalar	Visual*		**NEG**	---	---

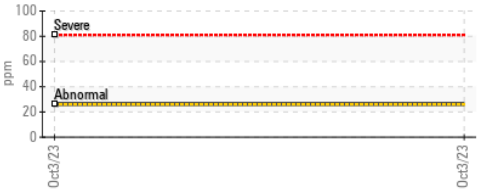
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D7279(m)	15.4	▲ **23.6**	---	---

GRAPHS

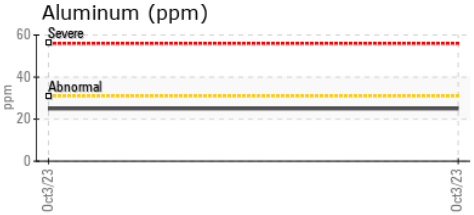
Iron (ppm)



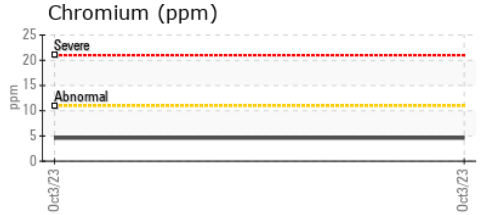
Lead (ppm)



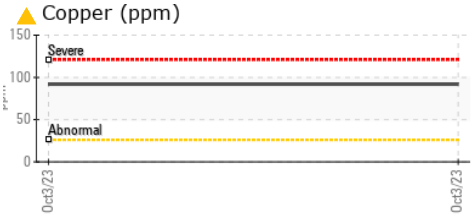
Aluminum (ppm)



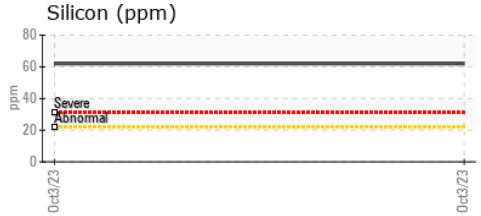
Chromium (ppm)



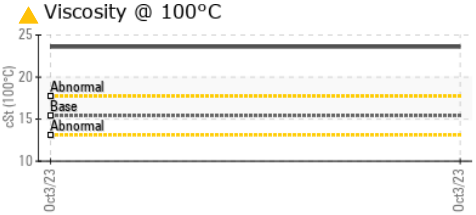
Copper (ppm)



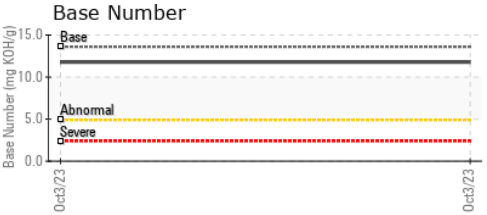
Silicon (ppm)



Viscosity @ 100°C



Base Number



ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PP
Lab Number : 02588244
Unique Number : 5657310
Test Package : MOB 3 (Additional Tests: Glycol)
Received : 11 Oct 2023
Diagnosed : 07 Nov 2023
Diagnostician : Kevin Marson

To discuss this sample report, contact Customer Service at 1-800-268-2131.
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
Validity of results and interpretation are based on the sample and information as supplied.

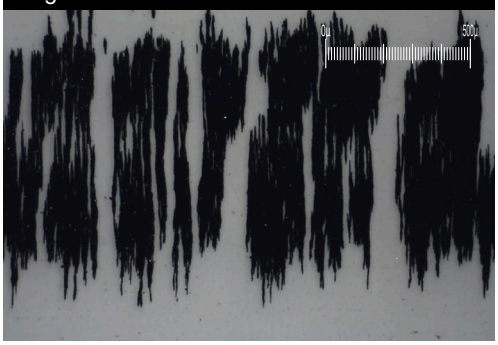
GREENTECH AG & TURF
116 WILLOWLEA RD
CARP, ON
CA K0A 1L0
Contact: Lyall Jollota
lyall.jollota@greentech.ca
T: (613)816-7191
F:

FERROGRAPHY REPORT

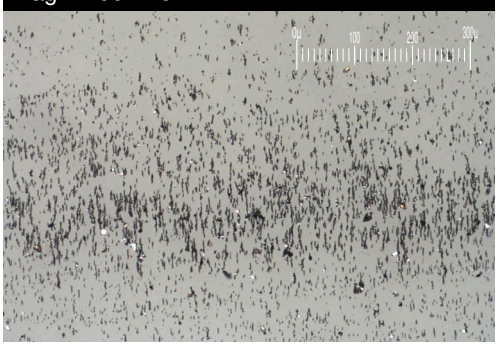
Machine Id
JOHN DEERE JOHN DEERE 9230
Component
Right Diesel Engine
Fluid
JOHN DEERE ENGINE OIL PLUS 50 II 15W40 (28 LTR)

Magn: 200x Illum: BC

Magn: 50x Illum: RW



Magn: 100x Illum: RW

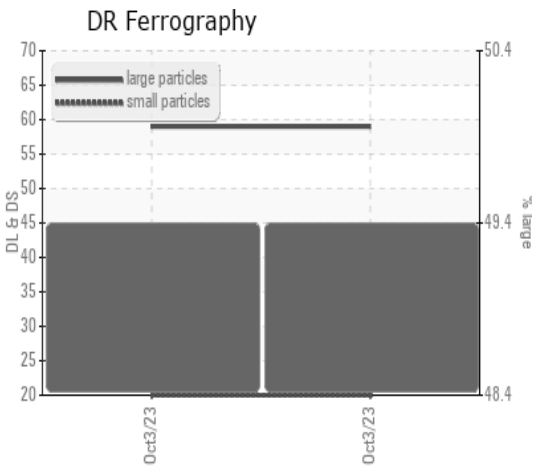


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		**59.0**	---	---
Small Particles		DR-Ferr*		**20.0**	---	---
Total Particles		DR-Ferr*	>---	**79**	---	---
Large Particles Percentage	%	DR-Ferr*		**49.4**	---	---
Severity Index		DR-Ferr*		**2301**	---	---

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		**7**		
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		**3**		
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*		**2**		
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*		**2**		
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*		**2**		
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Lubricant Degradation	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		**1**		
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		**2**		

WEAR

We have assumed that the oil was taken hot, according to the sampling instructions. Large Particles and severity index levels are severe. Tin ppm levels are severe. Total Particles levels are abnormal. Iron and copper and lead ppm levels are abnormal. Wear particle analysis indicates that the ferrous rubbing particles are abnormal. Cylinder, crank, or cam shaft wear is indicated. Bearing wear is indicated. Slide bearing wear is indicated.



This page left intentionally blank