

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

HITACHI HCMDD560P00010248

Component Diesel Engine

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

DIAGNOSIS

Recommendation

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

SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		JR0211384		
Sample Date		Client Info		16 May 2024		
Machine Age	hrs	Client Info		2473		
Oil Age	hrs	Client Info		0		
Oil Changed		Client Info		Changed		
Sample Status				NORMAL		
CONTAMINATIO	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0		
Water		WC Method	>0.2	NEG		
Glycol		WC Method		NEG		
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	15		
Chromium	ppm	ASTM D5185m	>20	<1		
Nickel	ppm	ASTM D5185m	>4	0		
Titanium	ppm	ASTM D5185m		0		
Silver	ppm	ASTM D5185m	>3	<1		
Aluminum	ppm	ASTM D5185m	>20	4		
Lead	ppm	ASTM D5185m	>40	6		
Copper	ppm	ASTM D5185m	>330	277		
Tin	ppm	ASTM D5185m	>15	<1		
Vanadium	ppm	ASTM D5185m		<1		
Cadmium	ppm	ASTM D5185m		0		
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 27	history1	history2
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	27		
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	27 0		
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	27 0 37		
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	27 0 37 <1		
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	27 0 37 <1 151		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	27 0 37 <1 151 2311	 	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	27 0 37 <1 151 2311 940	 	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	27 0 37 <1 151 2311 940 1119	 	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		27 0 37 <1 151 2311 940 1119 4238		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	27 0 37 <1 151 2311 940 1119 4238 current	 history1	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	limit/base	27 0 37 <1 151 2311 940 1119 4238 current 6	 history1	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	limit/base	27 0 37 <1 151 2311 940 1119 4238 current 6 2	 history1	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3	27 0 37 <1 151 2311 940 1119 4238 current 6 2 1 5 2 1 0.3	 history1 	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base	27 0 37 <1 151 2311 940 1119 4238 <u>current</u> 6 2 1 6 2 1 1 <u>current</u> 0.3 7.4	 history1 history1	 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3	27 0 37 <1 151 2311 940 1119 4238 current 6 2 1 5 2 1 0.3	 history1 history1 	 history2 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3 >20	27 0 37 <1 151 2311 940 1119 4238 <u>current</u> 6 2 1 6 2 1 1 <u>current</u> 0.3 7.4	 history1 history1 history1	 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3 >20 >30	27 0 37 <1 151 2311 940 1119 4238 <u>current</u> 6 2 1 0.3 7.4 19.0	 history1 history1	 history2 history2 history2



14.0 - Base

2.0 0.0 May16/24

19 т 18-Abnormal

17 cSt (100°C) 10°C) 15 Base

14

Abnormal 13 12 May16/24

OIL ANALYSIS REPORT

FT-IR (Direct Trend)	VISUAL		method	limit/base	current	history1	history2
Oxidation	White Metal	scalar	*Visual	NONE	NONE		
25 - Suffaction Suffaction	Yellow Metal	scalar	*Visual	NONE	NONE		
	Precipitate	scalar	*Visual	NONE	NONE		
20	Silt	scalar	*Visual	NONE	NONE		
15-	Debris	scalar	*Visual	NONE	NONE		
10	Sand/Dirt	scalar	*Visual	NONE	NONE		
	4		*Visual	NORML	NORML		
May16/24 May16/24	Odor	scalar		NORML	NORML		
2 2		scalar	*Visual				
Base Number	Emulsified Water	scalar	*Visual	>0.2	NEG		
.0 Base	Free Water	scalar	*Visual	12 - 24 /1	NEG		
.0			method	limit/base		history1	history2
	Visc @ 100°C GRAPHS	cSt	ASTM D445	15.4	13.1		
.0							
.0	Ferrous Alloys						
	14- iron						
May16/24	12 - newseenees chromium						
2	10-						
Viscosity @ 100°C	ظ s						
19 18 Abnormal	6						
Abnormal	4						
16	2						
Base 15 -							
14-	May16/24			May16/24			
- Abnormal	Mar			Mar			
12	Non-ferrous Metal	ls					
Мауі 6/24	300 copper						
Ma.	250						
	200-						
	톱 150 -						
	d 130						
	100-						
	50-						
	6/24			6/24			
	May16/24			May1			
	Viscosity @ 100°C			Base Number	-		
	¹⁹ T		14.0				
	18 Abnormal			12.0			
	17-						
	8 16			0.010.0 8.0 9.0 Base 9.0 See 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9			
	00 16 - Base 83 15 -			per (
				E 6.0			
	14 Abnormal			82 4.0	+		
	13			2.0			
	12						+
	May16/24			May16/24	May16/24		May16/24
	Ma			Ma	Ma		May
Laboratory Sample No. Lab Number Unique Number Unique Number	: 11033896	Receiv Testeo Diagn	ved : 17 d : 20 osed : 20	r, NC 27513 7 May 2024) May 2024 May 2024 - W	'es Davis	11047 LEA	E - ASHLAND DBETTER RD ASHLAND, VA US 23005
Certificate 12367 Test Package To discuss this sample repor * - Denotes test methods that Statements of conformity to s	t are outside of the ISO 1	ice at 1-80 7025 scop	00-237-1369 be of accred	litation.		ieg@jamesrivere T:	t: DAVID ZIEG equipment.com (804)798-6001 (804)798-0292

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