WEAR
CONTAMINATION
FLUID CONDITION

NORMAL NORMAL ATTENTION



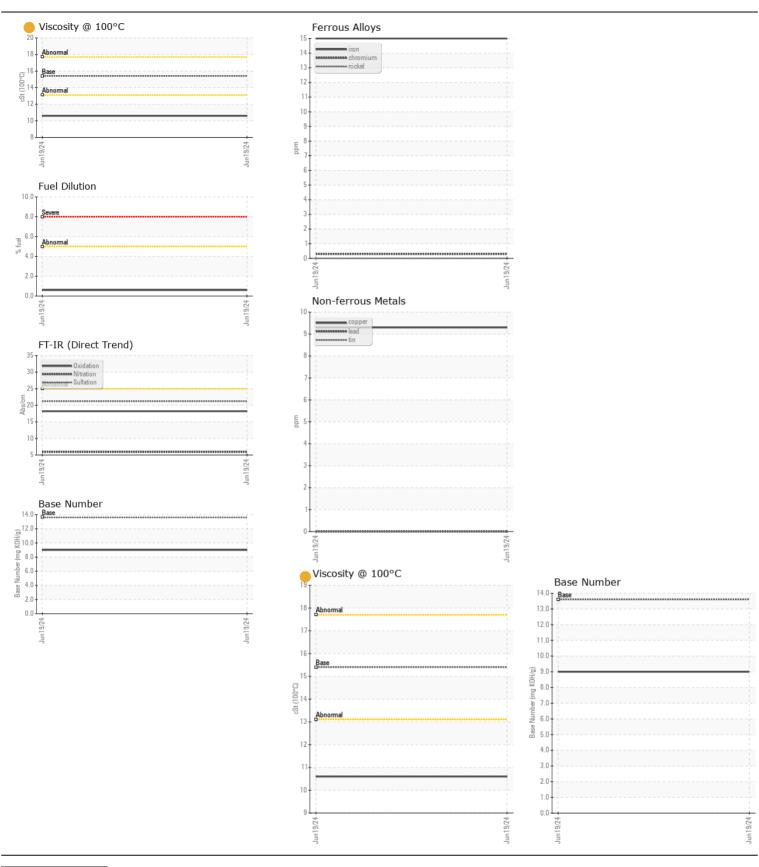
[05W47477]

CATERPILLAR 938 EZY00588

Diesel Engine

JOHN DEERE ENGINE OIL PLUS 50 II 15W40 (20 QTS)

Test	JOHN DEERE ENGINE OIL PLU	19 20 II 19 W	40 (20	J WIS)				
Sample Number Sample Sam	RECOMMENDATION	Test	UOM	Method	Limit/Abn	Current	Historv1	Historv2
Sample Date Client Info 19 Jun 2024	TIEGO MINIENDATION						,	
Machine Age No. Collaboration Machine Age No. Collent Info 305								
Oil Age hrs Client Info 305			hrs	Client Info				
Filter Age		Oil Age	hrs	Client Info				
Coll Changed Filter Changed Sample Status Chemt Info Changed Cha		_		Client Info				
Filter Changed Client Info Changed Cha		_		Client Info				
Name				Client Info				
Iron		_				_		
Chromium ppm ASTM DSISS 22 0								
Nickel ppm ASTM D5185m >2 0	WEAR	Iron	ppm	ASTM D5185m	>100	15		
Titanium ppm SSIM DiSists >2 0	Metal levels are typical for a new component breaking in.	Chromium	ppm	ASTM D5185m	>20	<1		
Silver ppm ASTM D6186m >25 2		Nickel	ppm	ASTM D5185m	>2	0		
Aluminum ppm ASTM D5185m >25 2		Titanium	ppm	ASTM D5185m	>2	0		
Lead ppm ASTM D5185m >40 0		Silver	ppm	ASTM D5185m	>2	0		
Copper		Aluminum	ppm	ASTM D5185m	>25	2		
Tin		Lead	ppm	ASTM D5185m	>40	0		
Vanadium Vanadium		Copper	ppm	ASTM D5185m	>330	9		
White Metal Yellow Metal Scalar Visual NONE NONE		Tin	ppm	ASTM D5185m	>15	0		
Vellow Metal Scalar Visual NONE NO		Vanadium	ppm			<1		
Silicon ppm ASTM D5185m >25 5		White Metal	scalar		NONE			
Potassium ppm ASTM 05185m >20 <1		Yellow Metal	scalar	*Visual	NONE	NONE		
Potassium ppm ASTM 05185m >20 <1	CONTABINATION	0:1:		40TM DE40E	05	_		
Fuel	CONTAMINATION							
Water								
Glycol WC Method NEG Soot % % *ASTM D7844 >3 0.1 Nitration Abs/.mm *ASTM D7624 >20 5.9 Silt scalar *Visual NONE NONE Silt scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NONE Mapearance scalar *Visual NORML NORML NORML NORML NORML NORML NORML NORML The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type. Sodium ppm ASTM D5185m 2 Molybdenum ppm ASTM D5185m 2 Magnaesium ppm ASTM D5185m 2 Magnesium ppm ASTM D5185m 2 Magnesium ppm ASTM D5185m 452 Magnesium ppm ASTM D5185m 1680 Calcium ppm ASTM D5185m 940 Sulfur ppm ASTM D5185m 1127 ASTM D5185m 3339 Oxidation Abs/.mm *ASTM D7144 >25 18.2 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339 ASTM D5185m 3339			%					
Soot %					>0.2			
Nitration Abs/cm *ASTM D7624 >20 5.9 Sulfation Abs/cm		-	0/		0			
Sulfation Abs/.tmm *ASTM D7415 >30 21.2 Silt scalar *Visual NONE NONE Debris scalar *Visual NONE NONE Sand/Dirt scalar *Visual NORM								
Silt Scalar *Visual NONE NONE NONE NONE Sand/Dirt Scalar *Visual NONE								
Debris Scalar *Visual NONE NONE Sand/Dirt Scalar *Visual NONE NONE NONE Sand/Dirt Scalar *Visual NONE NONE Sand/Dirt Scalar *Visual NORML NORML Scalar *Visual NORML NORML Scalar *Visual NORML NORML Scalar *Visual NORML NORML Scalar *Visual NORML NORML								
Sand/Dirt Scalar *Visual NONE NORE NORE Appearance Scalar *Visual NORML NORM								
Appearance								
Codor Scalar *Visual NORML NORML NORML Fmulsified Water Scalar *Visual *Visual >0.2 NEG								
Emulsified Water scalar *Visual >0.2 NEG								
Sodium ppm ASTM D5185m 2						_		
Boron ppm ASTM D5185m 45 Barium ppm ASTM D5185m 2 Molybdenum ppm ASTM D5185m 2 Magnesium ppm ASTM D5185m 452 Calcium ppm ASTM D5185m 1680 Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 940 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0				Visuai	70.2			
Boron ppm ASTM D5185m 45 Molybdenum ppm ASTM D5185m 2 Magnesium ppm ASTM D5185m 452 Calcium ppm ASTM D5185m 1680 Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 940 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0	FLUID CONDITION	Sodium	ppm	ASTM D5185m		2		
there is suitable alkalinity remaining in the oil. Confirm oil type. Molybdenum ppm ASTM D5185m 37 Manganese ppm ASTM D5185m 2 Magnesium ppm ASTM D5185m 452 Calcium ppm ASTM D5185m 1680 Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 1127 Sulfur ppm ASTM D5185m 33339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0			ppm			45		
Molybdenum ppm ASTM D5185m 37 Manganese ppm ASTM D5185m 2 Magnesium ppm ASTM D5185m 452 Calcium ppm ASTM D5185m 1680 Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 1127 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0		Barium	ppm			2		
Magnesium ppm ASTM D5185m 452 Calcium ppm ASTM D5185m 1680 Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 1127 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0		Molybdenum	ppm	ASTM D5185m		37		
Calcium ppm ASTM D5185m 1680 Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 1127 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0		Manganese	ppm	ASTM D5185m		2		
Calcium ppm ASTM D5185m 1680 Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 1127 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0		-		ASTM D5185m		452		
Phosphorus ppm ASTM D5185m 940 Zinc ppm ASTM D5185m 1127 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0		Calcium						
Zinc ppm ASTM D5185m 1127 Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0				ASTM D5185m		940		
Sulfur ppm ASTM D5185m 3339 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0			ppm			1127		
Oxidation Abs/.1mm *ASTM D7414 >25 18.2 Base Number (BN) mg KOH/g ASTM D2896 13.6 9.0		Sulfur				3339		
		Oxidation	Abs/.1mm	*ASTM D7414	>25			
		Base Number (BN)	mg KOH/g	ASTM D2896	13.6	9.0		
		Visc @ 100°C	cSt	ASTM D445	15.4	10.6		







Laboratory Sample No.

: JR0225317 Lab Number : 06217993 Unique Number : 11096190

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested**

: 24 Jun 2024 : 27 Jun 2024 Diagnosed

: 27 Jun 2024 - Jonathan Hester Test Package : CONST (Additional Tests: FuelDilution, PercentFuel, TBN)

5700 LAKEWRIGHT DR, SUITE 300 NORFOLK, VA

US 23502 Contact: ROBERT TAUBER rtauber@titanamerica.com T: (571)436-2579

TITAN VIRGINIA READY MIX LLC

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

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

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)