

John Deere Coolant Cavitation Test Report Forms

Title / Validity Declaration Page

Version

Conducted For

	V = Valid
	I = Invalid
	N = Results cannot be interpreted as representative of coolant performance (Non-Reference Coolant) and shall not be used in determining an average test result using multiple test acceptance criteria.

	NR = Non-reference Coolant Test
	RO = Reference Coolant Test

Test Number			
Stand:	Stand Run No:	Engine No.:	Engine Run No.:
Date Completed:		End of Test Time:	
Coolant Code:			
Formulation/Stand Code:			
Alternate Codes:			

<p>In my opinion this test _____ been conducted in a valid manner in accordance with the ASTM Test Method D 7583 and the appropriate amendments through the Information Letter system. The remarks included in the report describe the anomalies associated with this test.</p>

SUBMITTED BY _____ Testing Laboratory

Signature

Typed Name

Title

Form 2

John Deere Coolant Cavitation Test

Table of Contents

1.	Title / Validity Declaration Page	Form 1
2.	Table of Contents	Form 2
3.	Summary of Test Method	Form 3
4.	Test Result Summary	Form 4
5.	Test Result Breakdown	Form 5
6.	Operational Summary	Form 6
7.	Operational Summary (continued)	Form 7
8.	Coolant and Oil Analyses	Form 8
9.	Downtime Occurrences	Form 9
10.	Other Comments	Form 10

Form 3
John Deere Coolant Cavitation Test

Summary of Test Method

The John Deere Engine Coolant Cavitation Test Report Forms is a fired engine-dynamometer test which evaluates the ability of a heavy-duty engine coolant to provide protection against damage resulting from a phenomenon known as cylinder liner cavitation corrosion. Coolant performance is characterized by determining the total number of pits on the cylinder liners. The test operation consists of a 19 minute engine break-in, a 20 hour steady state coolant break-in, and the 230 hours while following an 8 minute stepped load and speed test cycle consisting of the 5 steps shown below.

Condition	Low Idle	Peak Torque	Full Load	Over Speed	Fast Idle
Duration, minutes	1.5	1	4	1	0.5
Engine Speed, r/min	900	1500	2100	2300	2500
Fuel Flow*, kg/h	Report	Report	68	68	Report
Engine Torque, N-m	0	1680	1220	1080	0
Manifold Abs Press, kPa	≥ 1	≥ 70	≥ 70	≥ 70	≥ 55
Engine Oil In, °C	88	88	88	88	88
Engine Coolant Out, °C	63	70	73	72	70
Engine Coolant In*, °C	56	66	63	61	61
Engine Coolant Pressure, kPa (gauge)	0	0	0	0	0
Fuel In Temperature, °C	41	40	40	41	41
Oil Gallery Temperature, °C	82	83	89	91	90
Intake Air Temperature, °C	20	20	20	20	20

* Fuel flow and coolant inlet temperature are not targets, just typical values.

Upon test completion, the engine is disassembled and rated for cylinder liner pitting.

Form 4
John Deere Coolant Cavitation Test
Test Result Summary: Non-Reference & Reference Coolant Tests

Laboratory:	Test Number:
Coolant Code:	
Formulation/Stand Code:	
Date Started:	Time Started:
Date Completed:	Time Completed:
Test Length:	Number of Valid Tests Since Stand Calibration ^A :
Industry TMC Coolant Code:	Laboratory Coolant Code:

^ANon-Reference tests only, includes current test if valid.

Test Results	
	Liner Cavitation Pit Count
Original Result	
Transformed Result	
Industry Correction Factor ^B	
Corrected Transformed Result	
Severity Adjustment	
Final Transformed Result	
Final Original Unit Result	

^B Currently no industry correction factors

Last Stand Reference Test Results	
Test Number	
TMC Coolant Code	
Date Completed	
Calibration Expiration Date	
	Liner Cavitation Pit Count
Final Original Unit Result	

Form 5
John Deere Coolant Cavitation Test
Test Result Breakdown

Laboratory:	Test Number:
Coolant Code:	
Formulation/Stand Code:	

Liner Part Number :

Pit Area Count						
Liner Number	Front	Thrust	Rear	Anti-Thrust	Total	
1						
2						
3						
4						
5						
6						
					Total	

Form 6
John Deere Coolant Cavitation Test
Operational Summary

Laboratory:	Test Number:
Coolant Code:	
Formulation/Stand Code:	

	Parameter	Units	Stage	Target	Average	Standard Deviation	Min	Max
Controlled Parameters	Engine Speed	r/min	20 Hr SS	2112				
			Low Idle	900				
			Peak Torque	1500				
			Full Load	2100				
			Over Speed	2300				
			Fast Idle	2500				
	Torque	Nm	20 Hr SS	766				
			Low Idle	0				
			Peak Torque	1680				
			Full Load	1220				
			Over Speed	1080				
			Fast Idle	0				
	Fuel In Temperature	°C	20 Hr SS	40				
			Low Idle	41				
			Peak Torque	40				
			Full Load	40				
			Over Speed	41				
			Fast Idle	41				
	Coolant Out	°C	20 Hr SS	70				
			Low Idle	63				
			Peak Torque	70				
			Full Load	73				
			Over Speed	72				
			Fast Idle	70				
	Intake Manifold Air Temperature	°C	20 Hr SS	100				
Low Idle			93					
Peak Torque			100					
Full Load			100					
Over Speed			100					
Fast Idle			100					

Form 7
John Deere Coolant Cavitation Test
Operational Summary – Operational Summary (continued)

Laboratory:	Test Number:
Coolant Code:	
Formulation/Stand Code:	

	Parameter	Units	Stage	Target	Average	Standard Deviation	Min	Max
Controlled Parameters	Exhaust Pressure	kPa	20 Hr SS	3.5				
			Low Idle	Report				
			Peak Torque	Report				
			Full Load	Report				
			Over Speed	Report				
			Fast Idle	Report				
	Coolant Pressure	kPa	20 Hr SS	10				
			Low Idle	10				
			Peak Torque	10				
			Full Load	10				
			Over Speed	10				
			Fast Idle	10				
Non-Controlled Parameters	Inlet Air Pressure	kPa	20 Hr SS	Report				
			Low Idle	Report				
			Peak Torque	Report				
			Full Load	Report				
			Over Speed	Report				
			Fast Idle	Report				
	Fuel Flow	kg/h	20 Hr SS	42				
			Low Idle	Report				
			Peak Torque	40				
			Full Load	68				
			Over Speed	68				
			Fast Idle	45				

Form 8
John Deere Coolant Cavitation Test
Analysis Results

Laboratory:	Test Number:
Coolant Code:	
Formulation/Stand Code:	

Coolant Analysis					
Analysis Parameter	Method	Units	Test Hours		
					EOT
Reserve Alkalinity	D1121	ml			
Freeze Point	D1177	°C			
Dilution	E202	%			
pH	D1287				
Calcium	D5185	mg/kg			
Copper					
Iron					
Magnesium					
Molybdenum					
Lead					
Silicon					
Chlorine					
NO ₂	D5897	mg/kg			
NO ₃					
PHO ₄					
SO ₄					

Oil Analysis					
Analysis Parameter	Method	Units	Test Hours		
					EOT
Viscosity@100 °C	D445	m ² /s			
Aluminum	D5185	mg/kg			
Chrome					
Copper					
Iron					
Lead					
TGA % Soot		%			
Fuel Dilution	D3524	%			
Coolant Dilution	D4291	%			

Average Oil Consumption, g/h	
------------------------------	--

