

Warm Up

Model:	L90
Serial #:	L90-141

IMPORTANT: The machine must be warmed up prior to performing any of the tests described in this document.

IMPORTANT: Make sure that all assembly procedures are complete and signed off prior to performing these tests.

Note: Temperatures indicated are relevant for factory fill fluids only. Any substitution may require adjusting these temperatures.

Engine Warm up

1. Idle engine for 3 minutes.
2. Bring engine to 1000 rpm and hold for 3 minutes.
3. Bring engine to 1800 rpm and hold for 3 minutes.
4. Minimum engine coolant temperature: 180° F

Transmission Warm up

1. Release the parking brake.
2. Fully apply service brakes (brake pedal).
3. Shift transmission into 4th gear forward.
4. Bring engine to 1500 rpm, and hold for 30 seconds.
5. Shift transmission into neutral.
6. Bring engine to 1500 rpm, and hold for 15 seconds.
7. Repeat steps 3-6 until the transmission fluid reaches 200° F.
8. Shift transmission into 4th gear forward.
9. Bring engine to maximum throttle, and hold for 30 seconds.
10. Shift transmission into neutral.
11. Bring engine to maximum throttle, and hold for 15 seconds.
12. Repeat steps 8 through 11 until the transmission fluid reaches 230° F.
13. Fluid temperature should stabilize between values indicated on the transmission pressure test page.

Hydraulic System Warm Up

1. Minimum hydraulic oil operating temperature prior to starting the machine is 35° F.
2. Slowly operate hydraulic circuits by fully extending and retracting all of the cylinders for five minutes.
3. Move the machine to full work capacity slowly until the hydraulic oil has achieved an operating temperature of 110° F.
4. Maximum hydraulic oil operating temperature is 160° F.

Hydraulic Systems Pressure Settings

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NOTE: Set all hydraulic pressures with engine at idle and hydraulic temperatures above 110°. See hydraulic schematic for pressure setting procedure.

	Min PSI	Max PSI	Set or Observed PSI
Steering LS Relief :	2000	2600	1
Steering Pump, Standby :	375	425	2
Steering Pump, Compensator :	3300	3500	3
LH Pump, Standby :	325	375	4
LH Pump, Compensator :	4350	4450	5
RH Pump, Standby :	325	375	6
RH Pump Compensator :	4350	4450	7

Initials :	
Date :	

Pump Inlet Pressure Test

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Check pump inlet conditions on pumps equipped with diagnostic quick couplers. Record non applicable (N/A) if the pump is not included, and **No Port** if a diagnostic coupler is not called for on the pump installation documentation. Close hydraulic tank vent, prior to warming up hydraulic system.

	Min	Max	Observed
Engine Idle Value (RPM):	740	760	8
Hydraulic Tank Temperature (°F):	110	140	9

	Required Engine RPM	Min PSI	Max PSI	Observed PSI
LH Hoist Pump (Full throttle while hoisting full speed) :	1900-2100	-2.5	15	10
RH Hoist Pump (Full throttle while hoisting full speed) :	1900-2100	-2.5	15	11
Steering Pump (Full throttle while hoisting full speed) :	1900-2100	-2.5	15	12
LH Fan Drive Pump :	2090-2100	-2.4	15	13
RH Fan Drive Pump :	2090-2100	-2.4	15	14
Brake Pump :	2090-2100	-2.5	15	15

Cooling Test

Record fan speeds as displayed on the Wagner Smart Screen for both left and right hand cooling packages.

	RH Cooling Package		
	Min	Max	Observed
Fan Speed @ Idle, Trans < 220° F (RPM) :	600	900	16
Temperature at which Fan Speed begins to increase (°F) :	218	222	17
Observed Max Fan Speed @ HFI (Transducer Disconnected) (RPM)	2200	2400	18

	LH Cooling Package		
	Min	Max	Observed
Fan Speed @ Idle, Engine Coolant < 193° F (RPM) :	600	900	19
Temperature at which Fan Speed begins to increase (°F) :	191	195	20
Observed Max Fan Speed @ HFI (Transducer Disconnected) (RPM)	2200	2400	21

Initials :
 Date :

Transmission Pressure Test

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	Min	Max	Observed
Transmission Oil Temperature (°F) :	180	200	22
	Min PSI	Max PSI	Observed PSI
Transmission Pressure, at Idle (PSI):	180	220	23
Converter In Pressure (PSI):	<i>Measured at Startup (no calculated value)</i>		24
Converter Out Pressure, At 2000 RPM (PSI):	55	70	25
Cooler In Pressure, At H.F.I. (PSI):	<i>Measured at Startup (no calculated value)</i>		26
Cooler Out Pressure, At H.F.I. (PSI):	<i>Measured at Startup (no calculated value)</i>		27
Lube Pressure (Port on Transmission Valve Plate), At H.F.I. (PSI):	NA	25	28

Note: Calculate the Delta Pressure by subtracting the cooler out Pressure from the cooler in Pressure.

Calculated
Delta-P

Maximum Calculated Delta Pressure (PSI) :	40	29
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	Forward Clutch Engine at Idle			Reverse Clutch Engine at Idle			
	Min PSI	Max PSI	Observed PSI	Min PSI	Max PSI	Observed PSI	
Fwd/Rev:	180	220		180	220		30
1st Gear:	180	220		180	220		31
2nd Gear:	180	220		180	220		32
3rd Gear:	180	220		180	220		33
4th Gear:	180	220		180	220		34

Note: Calculate the maximum observed difference in clutch pressures by subtracting the lowest value of the eight observed clutch pressures from the highest value of the eight.

Maximum Observed Difference in Clutch Pressures (PSI):	5	35
Max Difference		

Initials :	
Date :	

Brake System Test

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	Min PSI	Max PSI	Observed PSI
Brake application pressure * (PSI):	1500	1800	36
Secondary brake pressure ** (PSI):	1350	1800	37

* Idle engine for minimum 1 minute, release parking brake, depress brake pedal fully and record pressure at idle.

** Engine off, key on, release parking brake, depress pedal (hold 5 sec.), release pedal (off 5 sec.); repeat 5 times, record pressure on 6th depression.

	Min PSI	Max PSI	Observed PSI
At Idle with the brake not applied, residual brake circuit pressure (PSI):	0	7	38
At HFI with the brake not applied, residual brake circuit pressure (PSI):	0	7	39
Brake cooling pressure (inlet to brake) (PSI):	0	72.5	40
Brake cooling pressure @ HFI (outlet from brake) (PSI):	0	14.5	41
Parking brake release pressure (PSI):	1450	2600	42

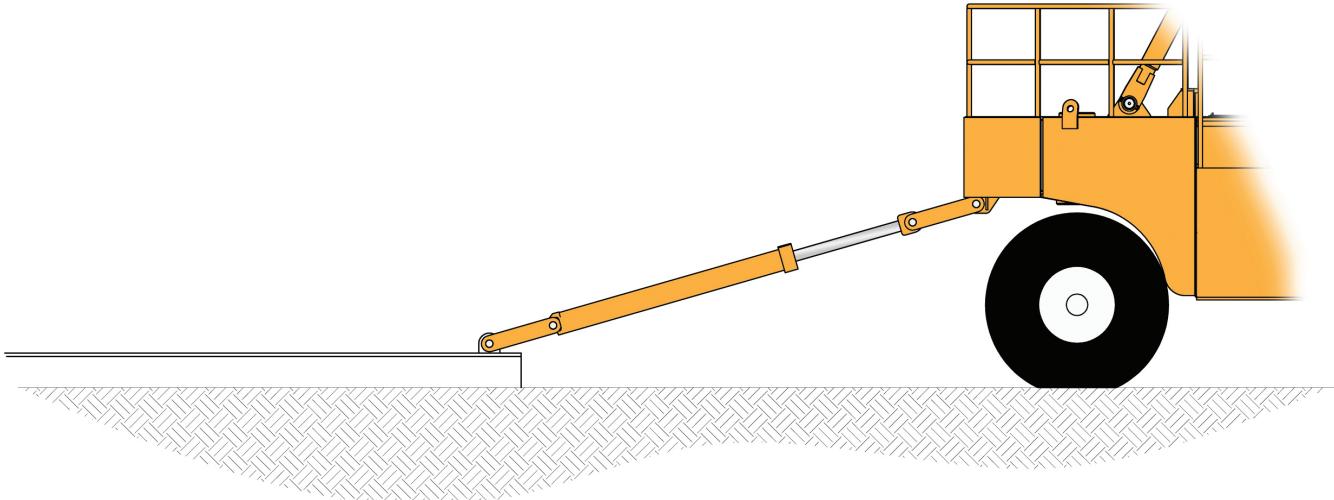
	Min PSI	Max PSI	Observed PSI
*Low brake pressure activation (PSI):	1450	1550	43

Record "Yes" or "No" in the box if Audio/Visual low brake pressure indicators work properly		44
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Initials :	
Date :	

Drawbar Test (Tractive Effort)

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	Left Side		Observed		Right Side		Observed	
Tire Pressure, Front (PSI):	108	108			108	108		45
Tire Pressure, Rear (PSI):	65				65			46

Verify and record the following values prior to performing this test:

	Min	Max	Observed
Hydraulic tank temperature (°F) :	110	160	47
Engine Idle Value (RPM) :	725	775	48
Engine High Free Idle Value (RPM) :	2150	2300	49
Converter stall (RPM) :	1950	1975	50

Install pressure gauge on stem port.

Record cylinder pressure and stall rpm at converter stall in 1st, 2nd, 3rd and 4th gears.

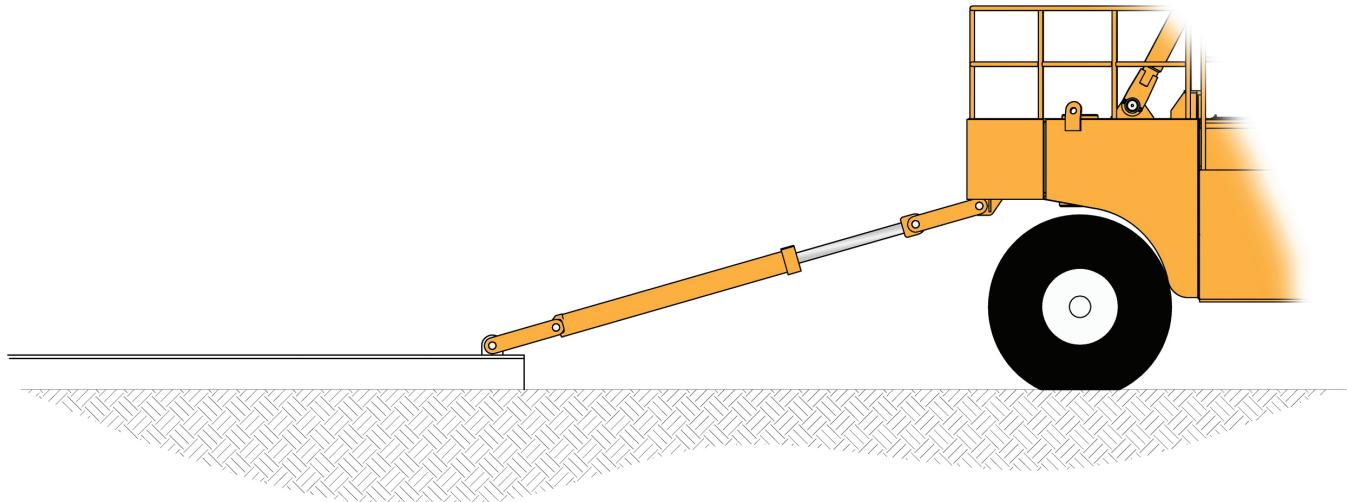
Note: Annular area of cylinder used for factory testing is 25.92 in²

	Did Tire Slip?	Min	Max	Observed
First Gear (if tire slips, record pressure at that moment) (PSI) Y <input type="checkbox"/> N <input type="checkbox"/> :	Slip or 3200	3800		51
Second Gear (PSI) :	1700	2100		52
Third Gear (PSI) :	800	1100		53
Fourth Gear (record NA if locked out) (PSI) :	350	550		54

Initials :
Date :

Brake Pull Test

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Install pressure gauge on stem port.

Pressurize stem port separately against service brake and then the parking brake.

Record pressure to move vehicle / slip brake.

When testing parking brake, release brake accumulator pressure to ensure service brakes are not actuated.

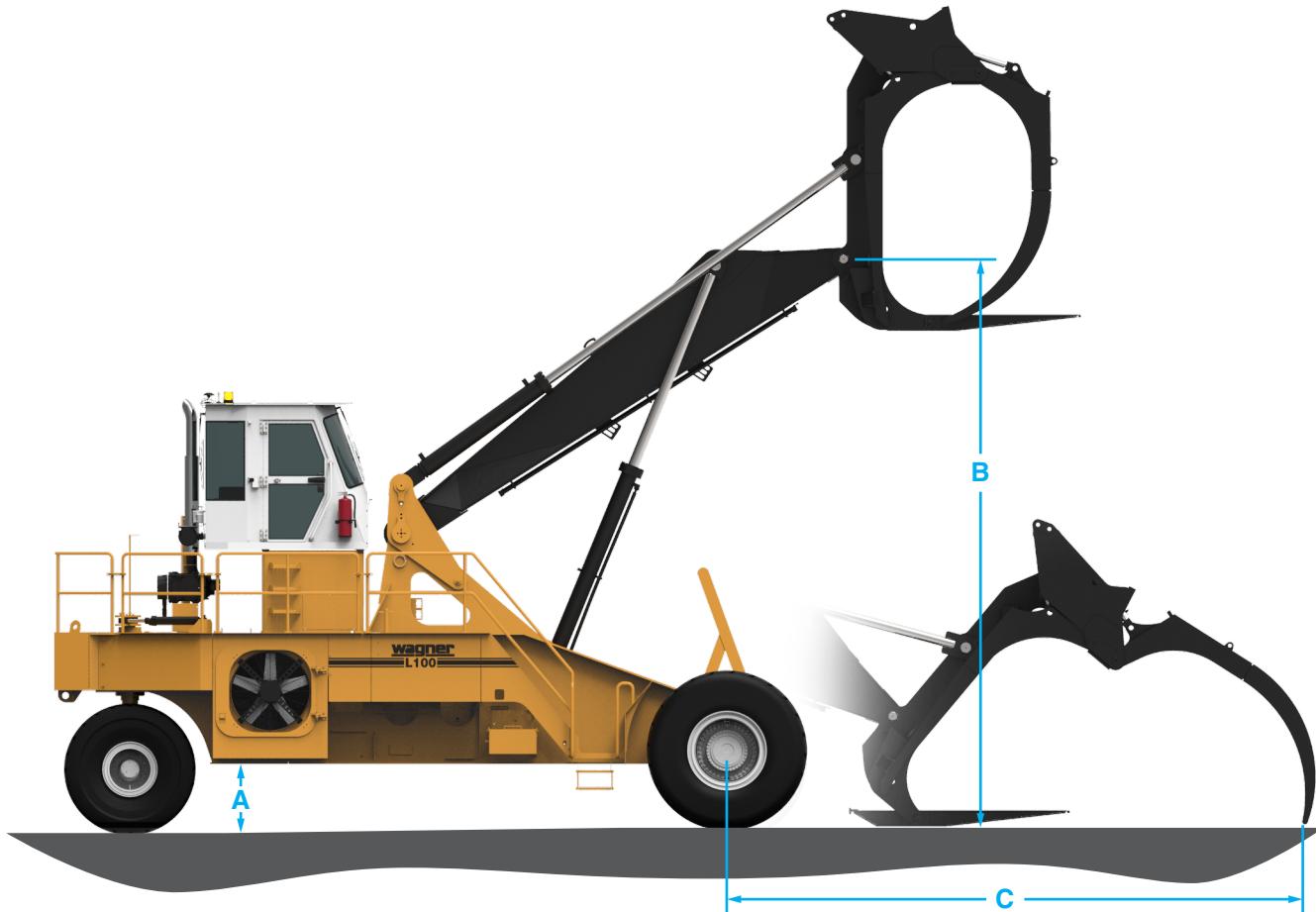
Note: Annular area of cylinder used for factory testing is 25.92 in².

	Min	Max	Observed
Service Brake Test (psi) :	2600	4000	55
Parking Brake Test (psi) :	1300	2500	56

Initials :	
Date :	

Dimensions

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Ground Clearance, Chassis (measure from rear of chassis lower flange) (A) :

	Min	Max	Observed
Ground Clearance, Chassis (measure from rear of chassis lower flange) (A) :	32"	36"	57
Ground to Carriage Pivot Pin at Maximum Hoist (B) :	301"	309 "	58
Axle to Holddown Tip at Maximum Reach (C) :	287"	311 "	59

Ground to Carriage Pivot Pin at Maximum Hoist (B) :

Axle to Holddown Tip at Maximum Reach (C) :

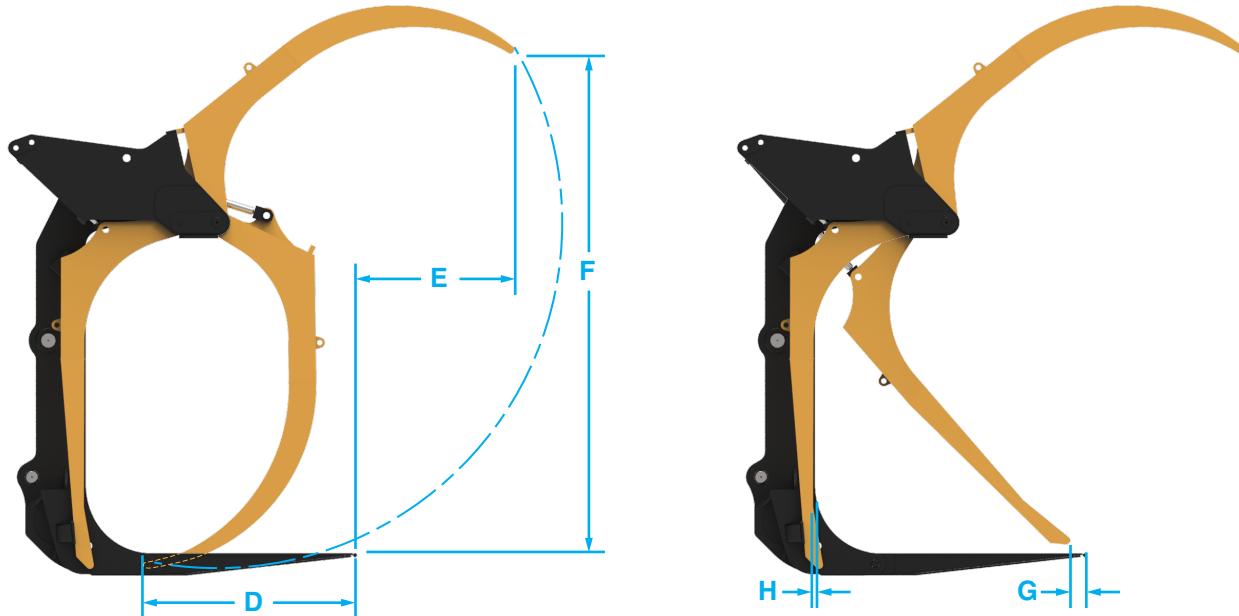
Initials :
Date :

Dimensions

Model:	L90
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With Tine horizontal, verify dimensions D, E, F, and G.

Verify that the Kickoff Arm is flush or recessed (max 1") from the carriage face when fully retracted.

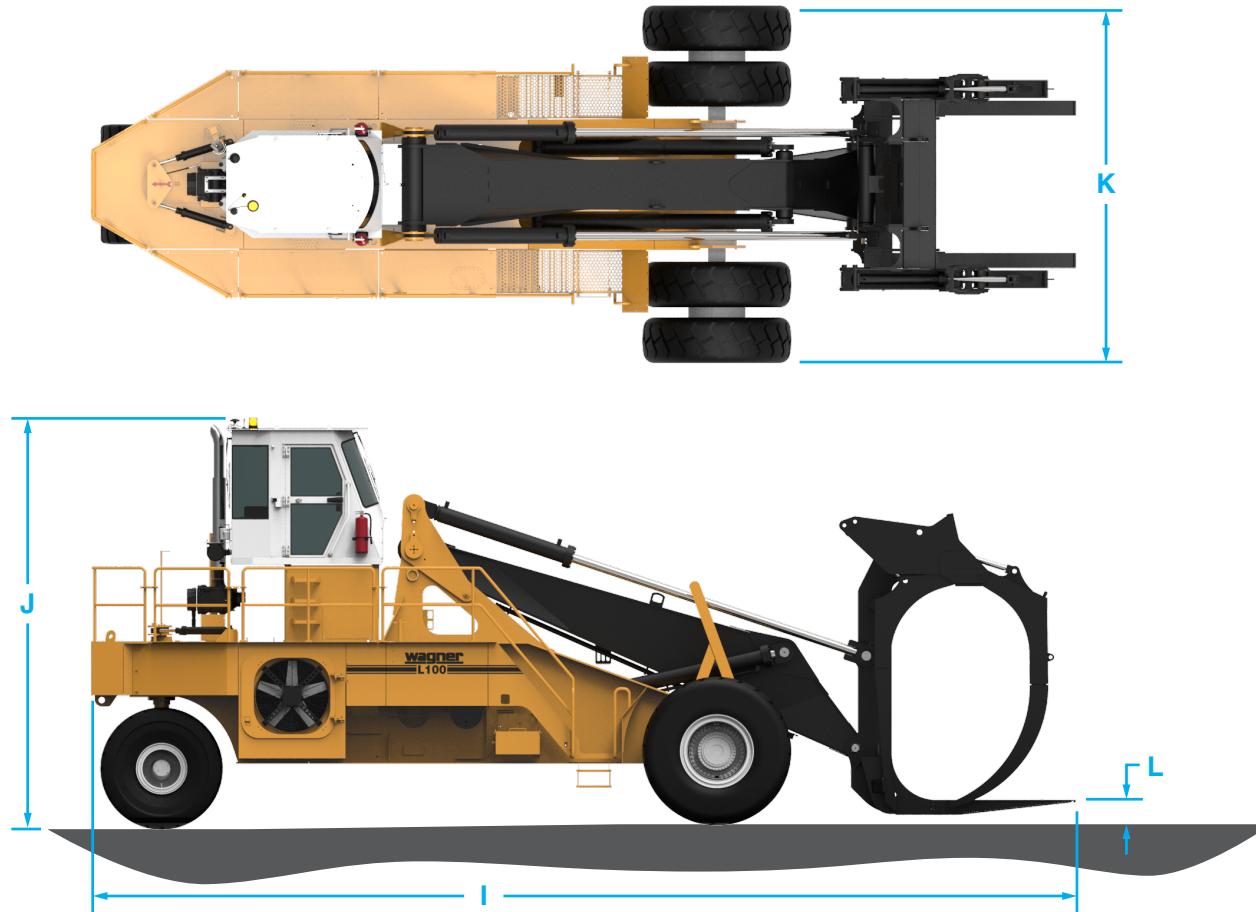


	Min	Max	Observed
Tine Tip to HD Tip, Horizontal, HD Closed (D) :	65"	75"	60
Tine Tip to HD Tip, Horizontal, HD Open (E) :	50"	60"	61
Tine Tip to HD Tip, Vertical, HD Open (F) :	185"	209"	62
KO Arm Tip to End of Tine (G) :	3"	9"	63
KO Arm to Carriage Face (H) :	-1"	0"	64

Initials :	
Date :	

Dimensions

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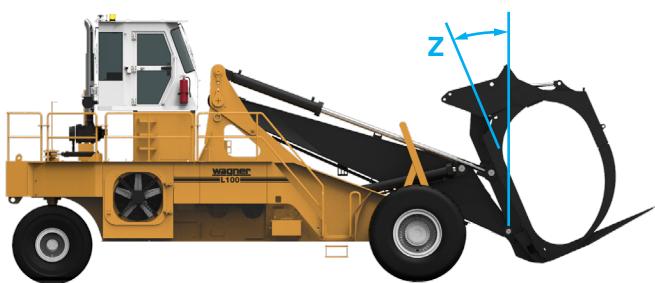
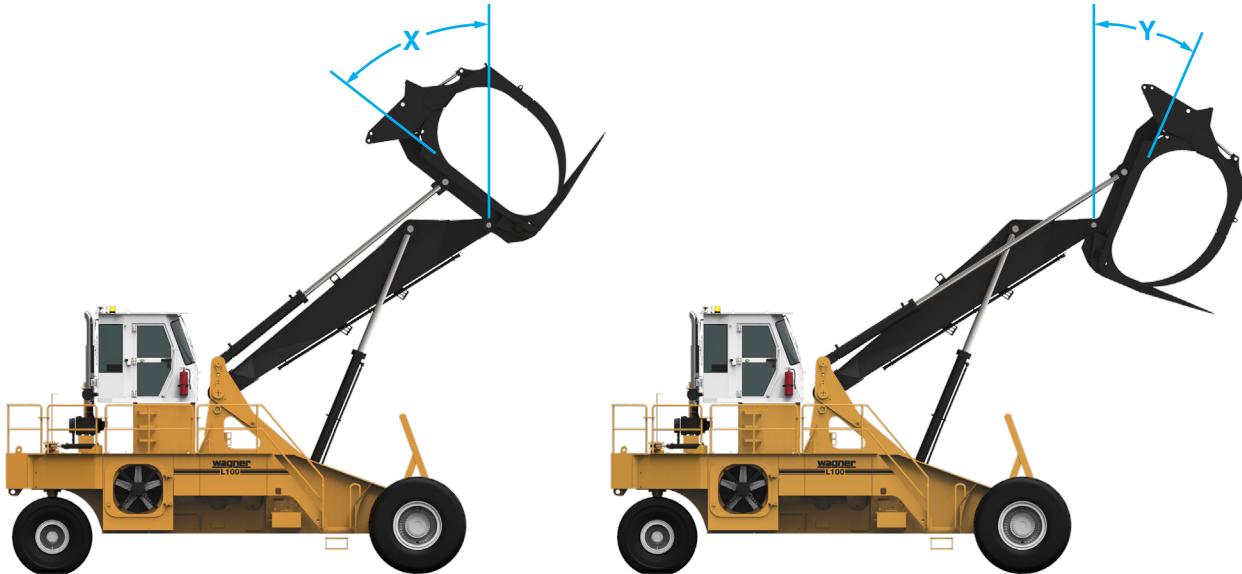
	Min	Max	Observed
Overall Length (I) :	547 "	559 "	65
*Overall Height (J) :	226"	234"	66
Overall Width (K) :	196"	206"	67
Ground to front tip of tine (L) :	10"	14"	68

* Overall height depends on what options are installed; horn, air conditioner or beacon light.

Initials :	<input type="text"/>
Date :	<input type="text"/>

Dimensions

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	Min	Max	Observed
Carriage Angle from Vertical - Hoist Fully Extended, Tilt Fully Retracted (X) :	45°	51°	° 69
Carriage Angle from Vertical - Hoist Fully Extended, Tilt Fully Extended (Y) :	23°	29°	° 70
Carriage Angle from Vertical - Hoist Fully Retracted, Tilt Fully Retracted (Z) :	19°	25°	° 71
Axle Weight, Rear (Lbs) :	56,000	60,000	72
Axle Weight, Front (Lbs) :	95,000	105,000	73

Initials :
Date :

Cycle Times

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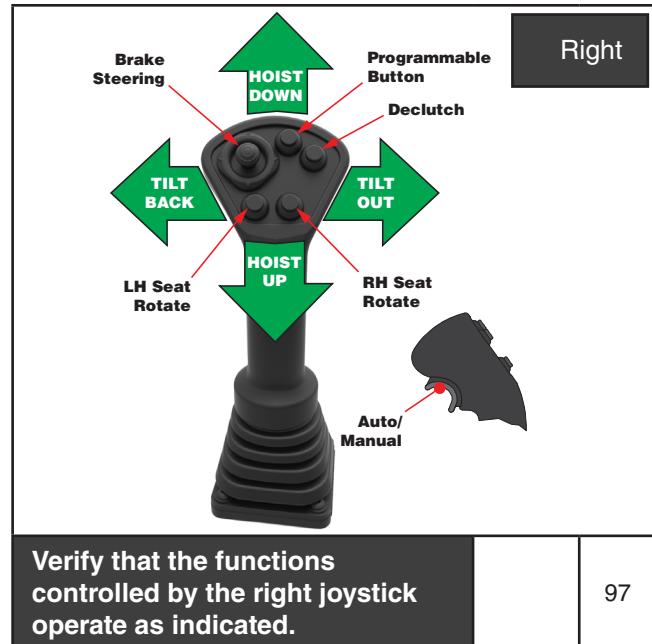
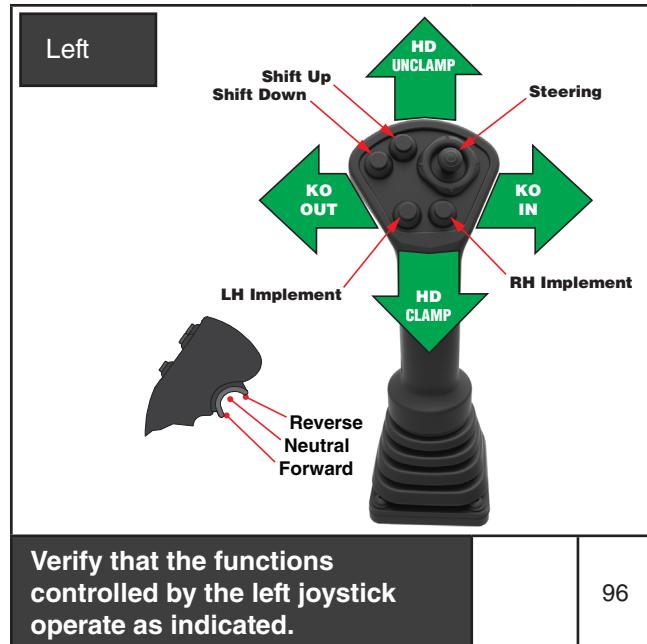
			Engine Idle		Engine H.F.I			
			Min	Max	Observed (Sec)	Min	Max	Observed (Sec)
Hoist Cylinder	Retract :	Measured at Startup (no calculated value)			5	10		74
	Extend :				9	11		75
Tilt Cylinder	Retract :	Measured at Startup (no calculated value)			3	5		76
	Extend :				4	7		77
RH Holddown Cylinder	Retract :	Measured at Startup (no calculated value)			2	3		78
	Extend :				2	3		79
LH Holddown Cylinder	Retract :	Measured at Startup (no calculated value)			2	3		80
	Extend :				2	3		81
RH Kickoff Cylinder	Retract :	Measured at Startup (no calculated value)			2	3		82
	Extend :				2	3		83
LH Kickoff Cylinder	Retract :	Measured at Startup (no calculated value)			2	3		84
	Extend :				2	3		85
RH Aux Holddown Cylinder	Retract :	Measured at Startup (no calculated value)			2	4		86
	Extend :				2	4		87
LH Aux Holddown Cylinder	Retract :	Measured at Startup (no calculated value)			2	4		88
	Extend :				2	4		89
Steering Wheel	Right- Left	Measured at Startup (no calculated value)			4	6		90
	Left- Right				4	6		91

			Min	Max	Observed (Turns)	
Steering Wheel Turns	Right-Left	4	6		94	Initials :
	Left-Right	4	6		95	Date :

Performance Validation

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Record "Yes" or "No" in the box for each joystick to indicate if the machine operates as indicated.

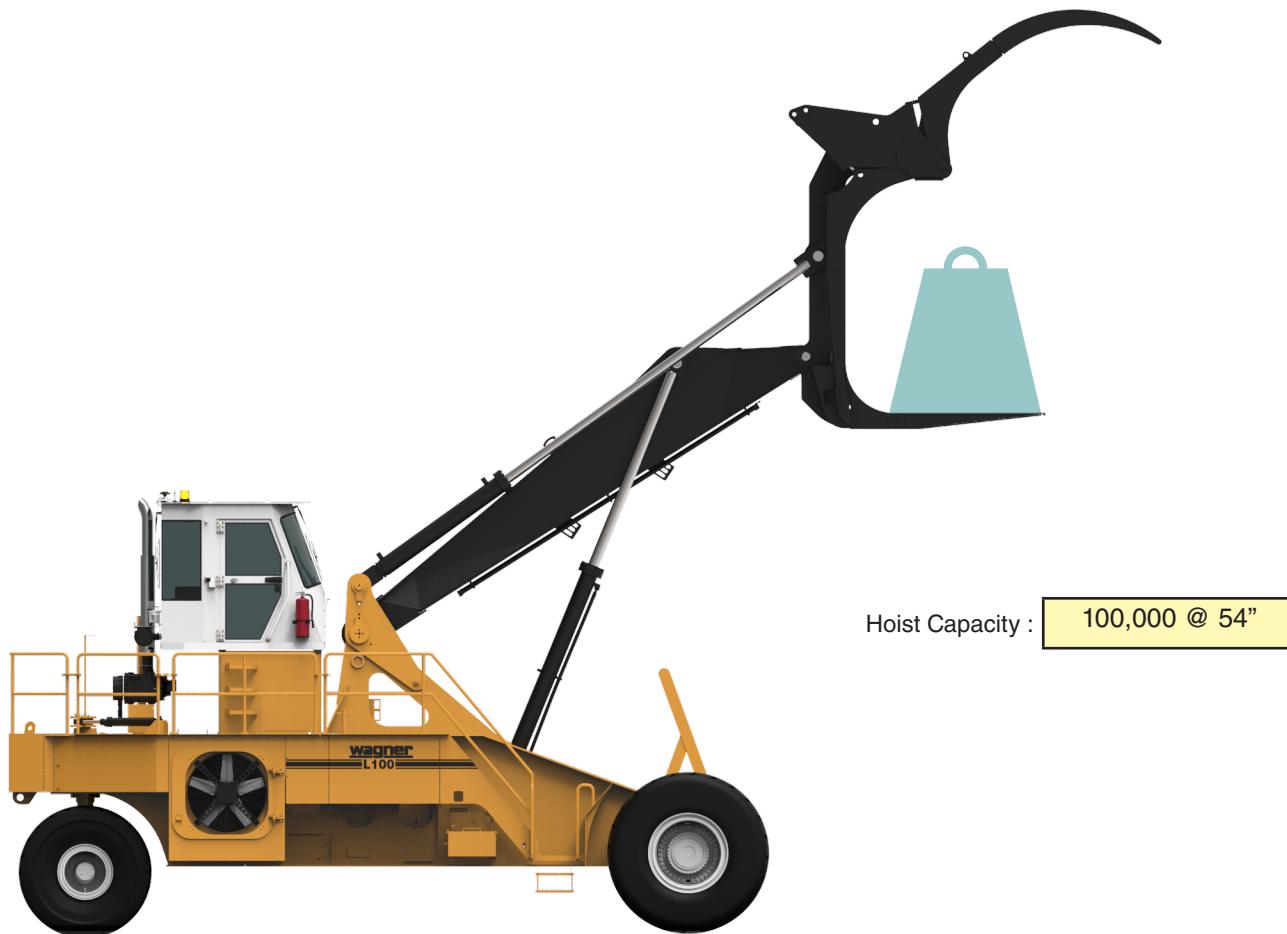


Initials :
Date :

Performance Validation

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Record "Yes" or "No" in the box to indicate if the machine can hoist the rated load.



Verify that the machine can hoist the rated load.

Secure back end before testing.

- Load centered in carriage
- Carriage level
- Carriage raised to its highest point

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Initials :

Date :