

## 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

Model: L90  
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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

Model:	L90
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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

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# Transmission Pressure Test

Model: L90  
Serial #: L90-141

	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):	Measured at Startup (no calculated value)			24
Converter Out Pressure, At 2000 RPM (PSI):	55	70		25
Cooler In Pressure, At H.F.I. (PSI):	Measured at Startup (no calculated value)			26
Cooler Out Pressure, At H.F.I. (PSI):	Measured at Startup (no calculated value)			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

	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.**

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

Initials :

Date :

## Brake System Test

Model: L90

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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

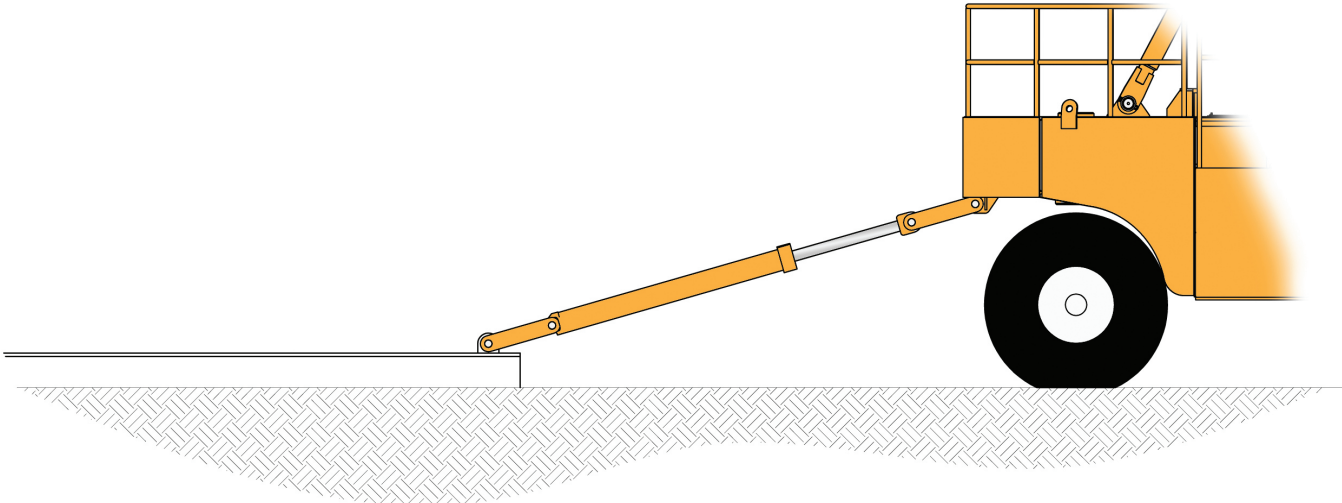
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Initials :

Date :

# Drawbar Test (Tractive Effort)

Model: L90  
Serial #: L90-141



	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 in<sup>2</sup>

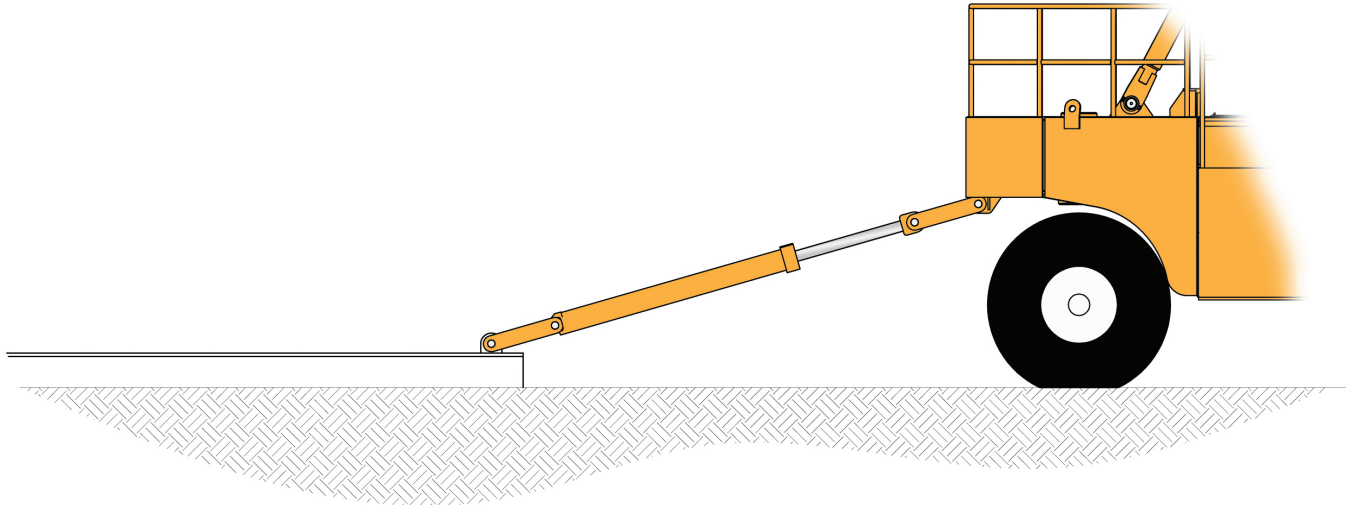
	Did Tire Slip?	Min	Max	Observed	
First Gear (if tire slips, record pressure at that moment) (PSI) Y <input type="checkbox"/> N <input type="checkbox"/>	Slip or 3200	3800			51
Second Gear (PSI) :	1700	2100			52
Third Gear (PSI) :	800	1100			53
Fourth Gear (record NA if locked out) (PSI) :	350	550			54

Initials :

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## Brake Pull Test

Model:	L90
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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 in<sup>2</sup>.

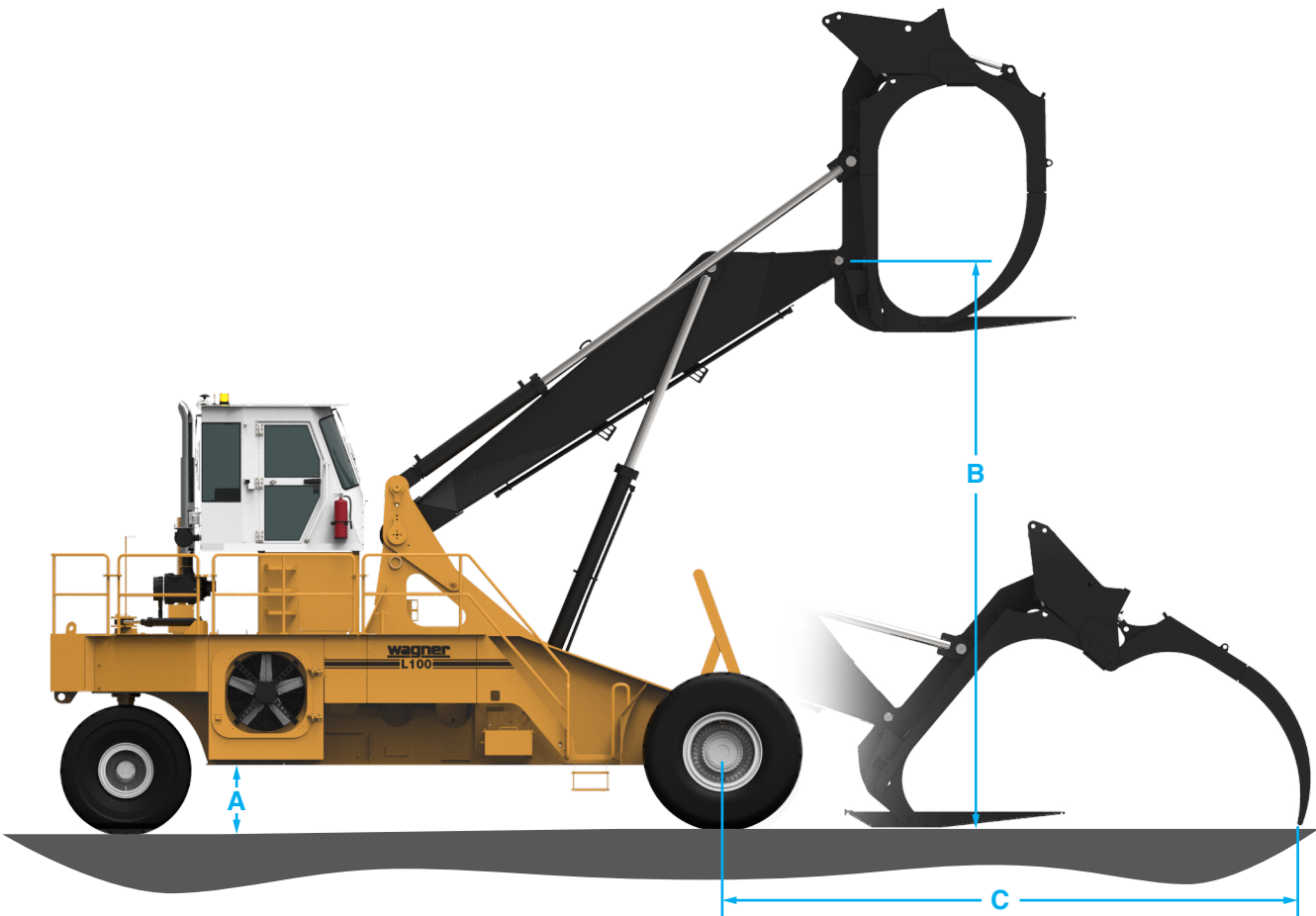
	Min	Max	Observed	
Service Brake Test (psi) :	2600	4000		55
Parking Brake Test (psi) :	1300	2500		56

Initials :

Date :

# Dimensions

Model:	L90
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	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

Initials :

Date :



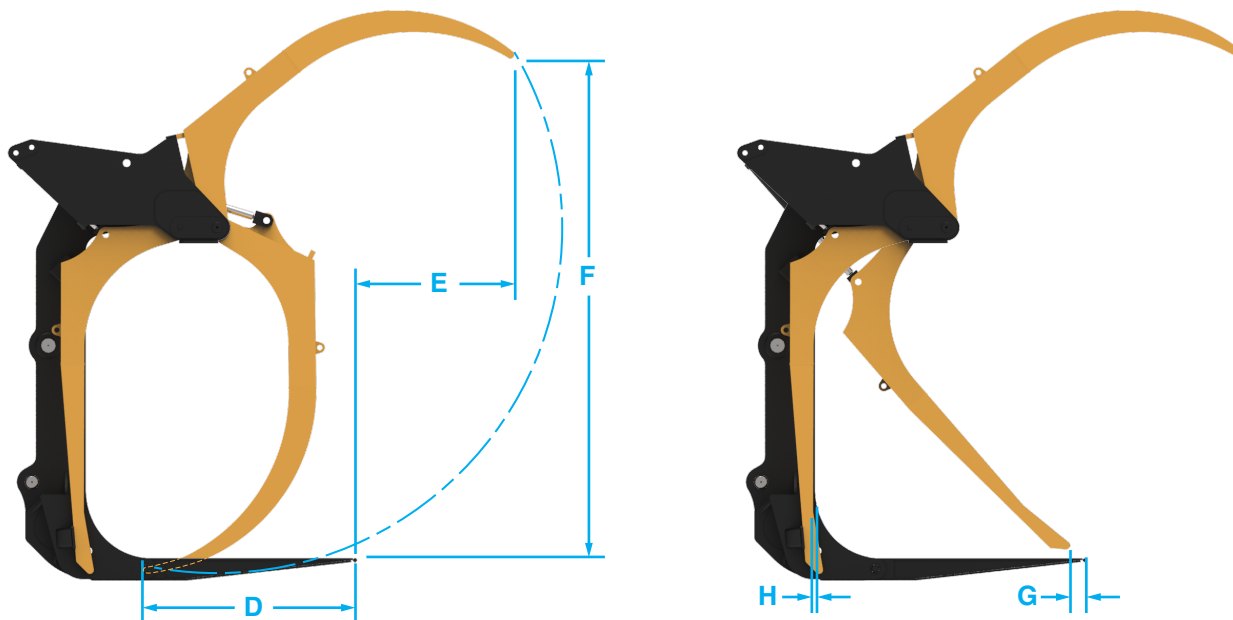
## Dimensions

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.



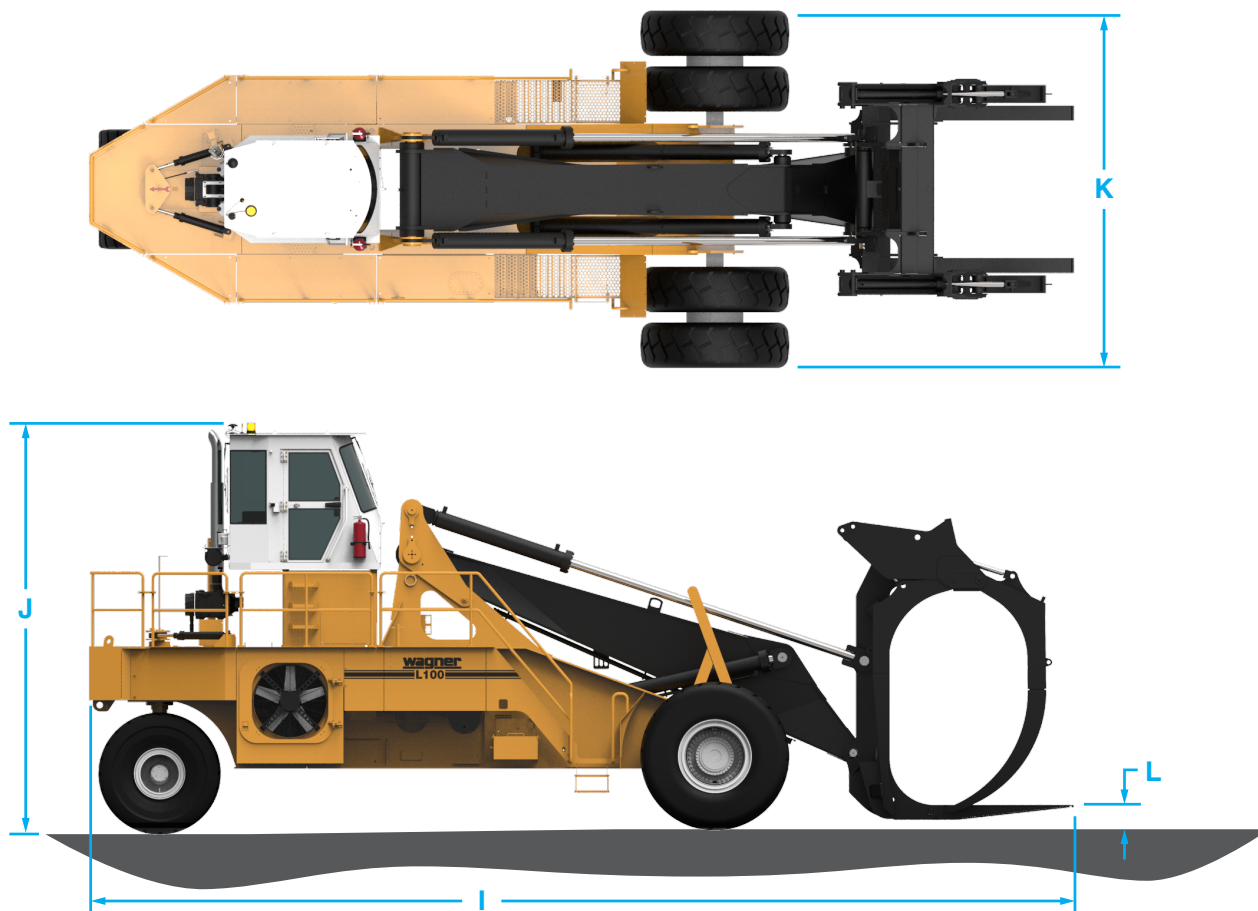
	Min	Max	Observed	
Tine Tip to HD Tip, Horizontal, HD Closed (D) :	65"	75"		60
Tine Tip to HD Tip, Horizontal, HD Open (E) :	50"	60"		61
Tine Tip to HD Tip, Vertical, HD Open (F) :	185"	209"		62
KO Arm Tip to End of Tine (G) :	3"	9"		63
KO Arm to Carriage Face (H) :	-1"	0"		64

Initials :

Date :

# Dimensions

Model: L90  
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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

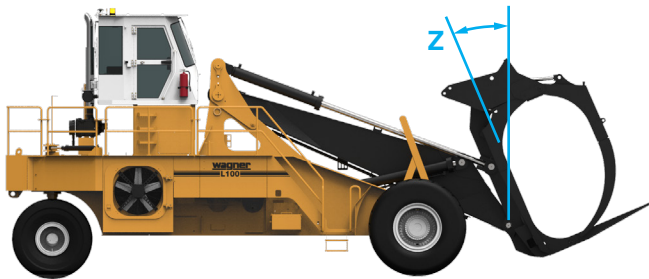
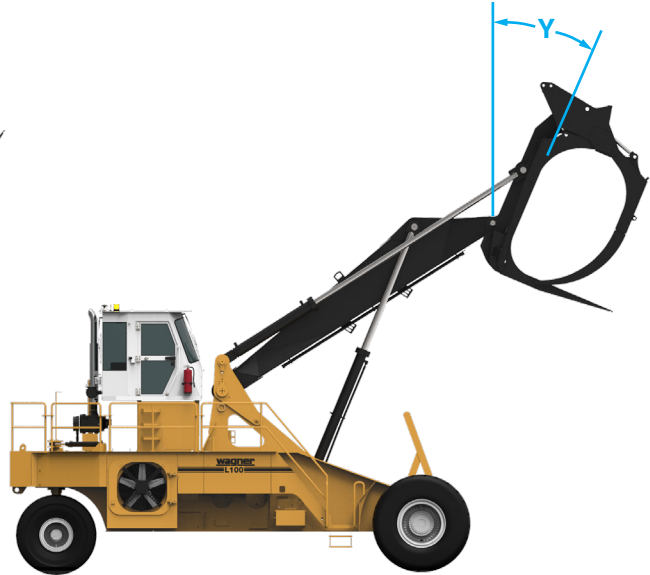
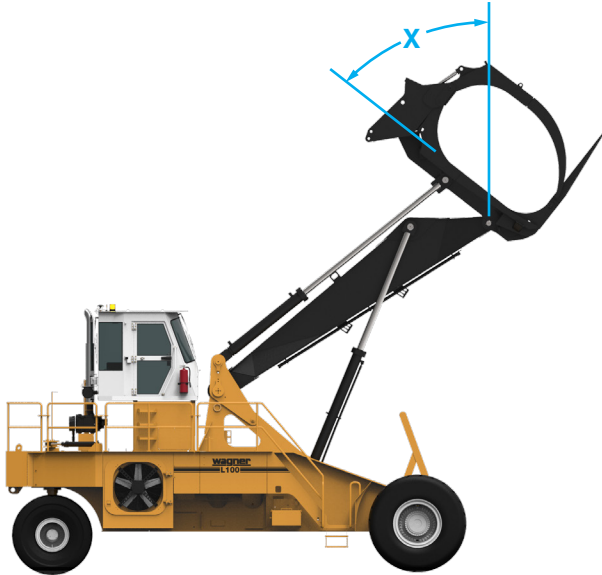
\* Overall height depends on what options are installed; horn, air conditioner or beacon light.

Initials :

Date :

## 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

Model: L90  
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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
	Left-Right	4	6		95

Initials :

Date :

## Performance Validation

Model: L90

Serial #: L90-141

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

Left	
Verify that the functions controlled by the left joystick operate as indicated.	96

Right	
Verify that the functions controlled by the right joystick operate as indicated.	97

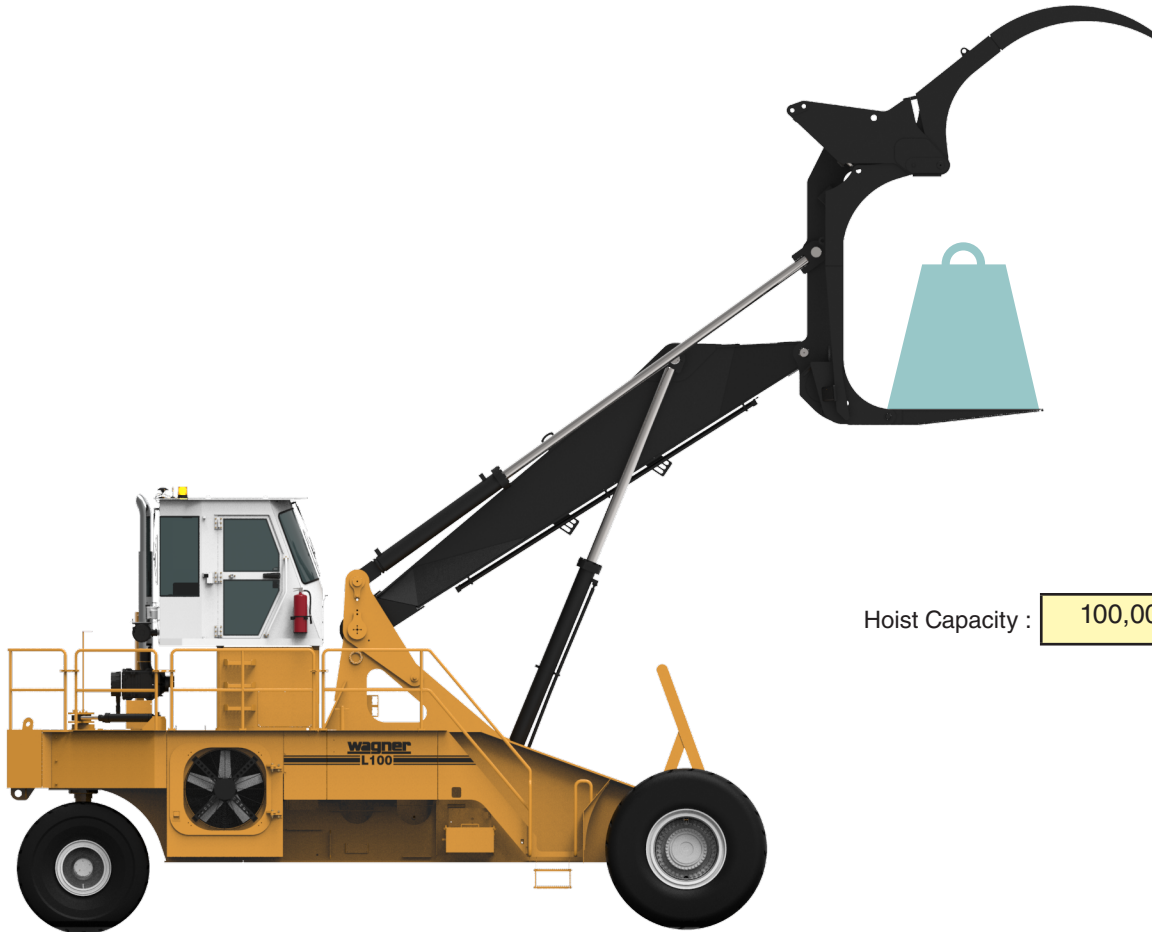
Initials :

Date :

## Performance Validation

Model: L90  
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Record "Yes" or "No" in the box to indicate if the machine can hoist the rated load.



Hoist Capacity : 100,000 @ 54"

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 :