

510 BACKHOE LOADER

19,165 lb (8693 kg)

Transport Height.....	13 ft 3 in. (4.04 m)
Transport Length.....	24 ft 7 in. (7.49 m)
Machine Width.....	6 ft 11.9 in. (2.13 m)

ENGINE.....John Deere 300 Series

Number of Cylinders and Displacement.....	4 cylinders, 270 cu in. (4.4 L)
Air Intake System.....	Naturally aspirated
Bore and Stroke.....	4.25 x 4.75 in. (108 x 121 mm)
Net hp at 2500 rpm.....	80 SAE hp (60 kW) DIN 63 kW
Maximum Torque at 1300 rpm.....	202 lb-ft (274 N•m)
Nozzle Opening Pressure:	
New.....	3200 ± 50 psi (22 065 ± 345 kPa)
Used.....	3000 ± 50 psi (20 685 ± 345 kPa)
Valve Clearance (Cold):	
Intake.....	0.018 in. (0.46 mm)
Exhaust.....	0.028 in. (0.71 mm)
Oil Pressure at 1900 rpm.....	25—40 psi (170—275 kPa)
Static Injection Pump Timing.....	Timing lines aligned w/flywheel located at TDC
Speeds:	
Slow Idle.....	800 ± 20 rpm
Fast Idle.....	2675—2700 rpm
Rated Full Load.....	2500 rpm
Cylinder Pressure Hot (Min).....	400 psi (2760 kPa) cranking with injectors removed
Flywheel Teeth.....	129

TRANSMISSION

Model and Speeds.....	Powershift: 8 forward, 4 reverse
Transmission Pressure at 1900 rpm.....	175 ± 10 psi (1200 ± 69 kPa)
Pump Flow at 175 psi (1210 kPa) and 2500 rpm (Used).....	14.5 gpm (0.91 L/s)
Lube Pressure.....	25—30 psi (170—207 kPa)
Filter Relief Pressure.....	50 psi (345 kPa) differential
Surge Relief Pressure.....	80—100 psi (550—690 kPa)

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HYDRAULIC SYSTEM—Close-Center

Main Hydraulic Pump (3.0 cu in.):

Standby Pressure 2300—2400 psi (15 860—16 550 kPa)

Minimum Flow 19 gpm at 2000 psi (13 790 kPa) at 1800 rpm

Mid-Mounted Hydraulic Pump Standby Pressure 100 psi (690 kPa) below main pump standby pressure

Main and Mid-Mounted Hydraulic

Pump (Minimum Flow):

At 2000 psi (13790 kPa) and 1800 rpm 33 gpm

At 1500 psi (10 345 kPa) and 1800 rpm 36 gpm

Main Hydraulic Pump (6 cu in.):

Standby Pressure 2300—2400 psi (15 860—16 550 kPa)

Minimum Flow 37.5 gpm at 2000 psi (13 790 kPa) and 1800 rpm
40 gpm at 1500 psi (13 790 kPa) and 1800 rpm

Main Hydraulic Pump Inlet Pressure

(3.00 or 6.00 cu in.) At least 5 psi (35 kPa)*

Accumulator Charge Pressure 500 psi (3450 kPa)

Filter Relief Pressure 50 psi (345 kPa) differential

Surge Relief Pressure 1150 psi (1030 kPa)

Priority Valve Setting:

(S.N. —209476) 1850—1950 psi (12 755—13 445 kPa)

(S.N. 209477—) 1350—1450 psi (9310—10 000 kPa)

Differential Lock Valve Pressure:

(S.N. —161707) 420—480 psi (2895—3310 kPa)

(S.N. 161708—) 510—560 psi (3515—3860 kPa)

Cooler Relief Pressure 135—145 psi (930—1000 kPa)

Note: *Except during backhoe bucket or crowd cylinder operation

RELIEF VALVE SETTINGS

Loader Circuit Relief Valves:

Bucket Rollback 2750 psi (18 960 kPa)

Bucket Dump 1500 psi (10 345 kPa)

Auxiliary 2500 psi (17 240 kPa)

Backhoe Circuit Relief Valves:

Crowd and Boom Lower 2500 psi (17 240 kPa)

Swing Right and Swing Left 2375 psi (16 375 kPa)

Boom Raise 3500 psi (24 135 kPa)

CYCLE TIMES (At Fast Idle and Hot Oil)

Loader Functions:

Bucket:

Retract (Maximum) 2.5 sec

Extend (Maximum) 3.5 sec

Swing (180°) (Minimum) 3.5—6 sec

Backhoe Functions:

Boom:

Raise 5.7 sec

Lower (Power) 5.3 sec

Lower (Float) 7.5 sec

Bucket Dump 4.2 sec

LUBRICANTS

See front of this book for the codes [].

CAPACITIES

	U.S.	Imp.	Metric
Engine:			
Cooling System [N]	4.75 gal	4.0 gal	18.0 L
Crankcase w/ Filter [E].....	8 qt	6.7 qt	7.6 L
Fuel Tank	34 gal	28.3 gal	128.7 L
Transmission (Refill) [C]	10.5 gal	8.75 gal	39.7 L
Transmission and Hydraulic System [C].....	29.9 gal	25.0 gal	113.2 L

TIRE PRESSURE (Cold Inflation)

Tire Size	Type	Rating	Normal Pressure
Front:			
14.5/75-16.1	F3	10 ply	40 psi (280 kPa)
Rear:			
18.4-28	R4	12 ply	32 psi (207 kPa)