



JD

CONSTRUCTION EQUIPMENT DIVISION

BACKHOE



MODEL NO.

**310SG**

# 310SG

BACKHOE LOADER

SPECIFICATIONS



<b>Engine</b>	<b>3099SG</b>
Type	John Deere 4045T - Turbocharged
Rated power @ 2,000 rpm	90 SAE gross hp (66 kW) / 95 SAE net hp (64 kW)
Cylinders	4
Displacement	376 cu. in. (4,524 L)
Fuel consumption, typical	1.3 to 3.3 gal/hr (4.9 to 12.7 L/hr)
Torque rise	58 percent
Maximum net torque	273 ft.-lb. (369 Nm)
Lubrication	pressure system with spin-on filter and cooler
Air cleaner	dual stage dry type with safety element and pre-cleaner
Electrical system	12 volt with 65-amp alternator
Suction-type cooling fan	

## Transmission

Four-speed, helical-cut gear, collar-shift transmission synchronized in all gears with hydraulic reverser		
Torque converter, single-stage, dual phase with 2.63:1 stall ratio	11 in. (280 mm)	
Total speeds with 10.55:24 rear tires	Forward	Reverse
Gear 1	3.6 mph (5.8 km/hr)	4.0 mph (6.4 km/hr)
Gear 2	5.9 mph (9.5 km/hr)	6.6 mph (10.6 km/hr)
Gear 3	14.4 mph (23.2 km/hr)	16.1 mph (25.9 km/hr)
Gear 4	24.4 mph (39.3 km/hr)	27.2 mph (43.8 km/hr)

## Final Drives

Non-slip, ribbed planetary final drives evenly distribute shock loads over three gears.

## Brakes

Power-assisted, hydraulic wet disc, mounted inboard, self-adjusting and self-equalizing.

## Capacities

Fuel tank (with ground level fueling)	36 gal. (136 L)
Engine coolant	17 qt. (16 L)
Engine oil including filter	9 qt. (8.5 L)
Torque converter and transmission	15 qt. (14 L)
Hydraulic system	24 gal. (91 L)
Rear axle	3.5 gal. (13 L)
Mechanical front-wheel-drive axle	2.3 gal. (8.5 L)

## Steering

Hydrostatic power steering and emergency steering conform to ISO2610.

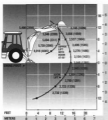
Non-powered axle	
Curb turning radius with brakes	11 ft. 9 in. (3.57 m)
Without brakes	13 ft. 3 in. (4.04 m)
Bucket clearance circle with brakes	31 ft. 6 in. (9.61 m)
Without brakes	34 ft. 7 in. (10.55 m)
Steering wheel turns, stop to stop	2.3 to 3.2
Mechanical front-wheel-drive	
Curb turning radius with brakes	18 ft. 11 in. (5.74 m)
Without brakes	13 ft. 8 in. (4.17 m)
Bucket clearance circle with brakes	29 ft. 9 in. (9.07 m)
Without brakes	35 ft. 3 in. (10.74 m)
Steering wheel turns, stop to stop	2.5
Axle oscillations stop to stop, both axles	22 degrees
Axle ratings (SAE J43)	
Front	18,800 lb. (8555 kg)
Rear	13,670 lb. (6200 kg)

## Hydraulic System

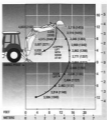
System	open center
Pressure	
Backhoe	3,625 psi (25,000 kPa)
Loader	3,000 psi (20,700 kPa)
Pump	gear type, tandem with unloader
Flow @ 2,200 rpm	
Backhoe	36 gpm (136 L/min)
Loader	38 gpm (106 L/min)
Filter, return oil	10-micron, spin-on enclosed replaceable element

\*Lift capacities are over-end values in lb. (kg) according to SAE J31. Figures listed are 87% of the maximum lift force available. Base vehicle includes counterweight.

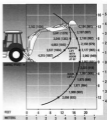
**3185G Backhoe with Standard Diggerrock**



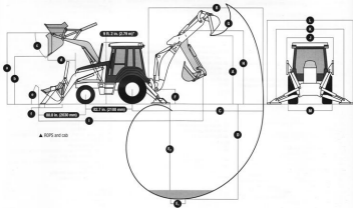
**3185G Backhoe with 3-yr, 6-in. (1.87 m) Extendable Diggerrock, Retracts**



**3185G Backhoe with 3-yr, 6-in. (1.87 m) Extendable Diggerrock, Extends**



**Dimensions, 3185G**



## Backhoe

	3105G		With Extendable Dipperstick*	
	With Standard Backhoe*		Retracted*	Extended
A Loading height, truck loading position	11 ft. 3 in. (3.43 m)		11 ft. 7 in. (3.53 m)	14 ft. 1 in. (4.29 m)
B Reach from center of swing pivot	18 ft. 3 in. (5.56 m)		18 ft. 7 in. (5.66 m)	21 ft. 11 in. (6.66 m)
C Reach from center of rear axle	21 ft. 9 in. (6.63 m)		22 ft. 1 in. (6.73 m)	25 ft. 4 in. (7.72 m)
D Maximum digging depth	14 ft. 8 in. (4.42 m)		14 ft. 11 in. (4.55 m)	18 ft. 5 in. (5.61 m)
E Digging depth (S&L):				
(1) 2 ft. (610 mm) flat bottom	14 ft. 4 in. (4.37 m)		14 ft. 9 in. (4.50 m)	18 ft. 3 in. (5.56 m)
(2) 8 ft. (2440 mm) flat bottom	13 ft. 4 in. (4.06 m)		13 ft. 9 in. (4.19 m)	17 ft. 6 in. (5.33 m)
F Ground clearance, minimum	13 in. (330 mm)		13 in. (330 mm)	13 in. (330 mm)
G Bucket rotation	190 degrees		190 degrees	190 degrees
H Transport height	11 ft. 6 in. (3.51 m)		11 ft. 5 in. (3.48 m)	11 ft. 5 in. (3.48 m)
I Overall length, transport	23 ft. 6 in. (7.16 m)		23 ft. 6 in. (7.16 m)	23 ft. 6 in. (7.16 m)
J Stabilizer width - transport with ROPS	7 ft. 2 in. (2.18 m)		7 ft. 2 in. (2.18 m)	7 ft. 2 in. (2.18 m)
K Stabilizer spread - spreading	18 ft. 2 in. (5.10 m)		18 ft. 2 in. (5.10 m)	18 ft. 2 in. (5.10 m)
L Stabilizer overall width - spreading	11 ft. 7 in. (3.53 m)		11 ft. 7 in. (3.53 m)	11 ft. 7 in. (3.53 m)
M Width over tires	86 in. (2.18 m)		86 in. (2.18 m)	86 in. (2.18 m)

\*Backhoe specifications are with 24-in. x 7.5-cu. ft. (610 mm x 0.21 m<sup>3</sup>) bucket.

## Loader Performance with Bucket Options

	1.25-cu. yd. (0.96 m <sup>3</sup> ) Heavy-Duty Long Lip	1.30-cu. yd. (1.00 m <sup>3</sup> ) Heavy-Duty Long Lip	1.12-cu. yd. (0.86 m <sup>3</sup> ) Multipurpose	1.25-cu. yd. (0.96 m <sup>3</sup> ) Multipurpose
Operator control	single lever	single lever	single lever	single lever
Breakout force	8,817 lb. (39.2 kN)	8,900 lb. (39.6 kN)	8,325 lb. (37.0 kN)	8,300 lb. (36.9 kN)
Lifting capacity, full height	8,247 lb. (3708 kg)	8,150 lb. (3700 kg)	5,900 lb. (2676 kg)	5,800 lb. (2601 kg)
a Height to bucket hinge pin, maximum	11 ft. 2 in. (3.40 m)	11 ft. 2 in. (3.40 m)	11 ft. 2 in. (3.40 m)	11 ft. 2 in. (3.40 m)
b Dump clearance, bucket at 45 degrees	8 ft. 2 in. (2.50 m)	8 ft. 8 in. (2.64 m)	8 ft. 7 in. (2.62 m)	8 ft. 7 in. (2.62 m)
c Bucket dump angle, maximum	45 degrees	45 degrees	45 degrees	45 degrees
d Reach at full height, bucket at 45 degrees	36.0 in. (911 mm)	30.1 in. (766 mm)	32.2 in. (818 mm)	32.2 in. (818 mm)
e Rollback angle at ground level	40 degrees	40 degrees	40 degrees	40 degrees
f Digging depth below ground, bucket level	5.0 in. (147 mm)	8.1 in. (206 mm)	7.3 in. (185 mm)	7.3 in. (185 mm)
Raising time to full height	4.9 sec.	4.9 sec.	4.9 sec.	4.9 sec.
Bucket dump time	1.1 sec.	1.1 sec.	1.1 sec.	1.1 sec.
Bucket lowering time (power down)	1.9 sec.	1.9 sec.	1.9 sec.	1.9 sec.

## Lift Capacity with Quick-Coupler/Forks

A <sup>1</sup> Maximum height	4.178 ft. (1267 kg)
B <sup>2</sup> Maximum reach	6.191 ft. (2810 kg)
C <sup>3</sup> At ground line	6.232 ft. (3737 kg)
D <sup>4</sup> Below ground line	4.4 ft. (112.7 mm) to bottom of tire / 2.7 in. (68.3 mm) to top of tire



Cylinders	3105G		
	Size	Stroke	Rod
Loader boom (2)	3.15 in. (80 mm)	31.5 in. (798 mm)	1.97 in. (50 mm)
Loader bucket (1)	3.54 in. (90 mm)	29.5 in. (744 mm)	1.97 in. (50 mm)
Backhoe boom (1)	4.72 in. (120 mm)	31.3 in. (795 mm)	2.30 in. (58 mm)
Backhoe crowd (1)	4.53 in. (115 mm)	25.9 in. (657 mm)	2.48 in. (63 mm)
Backhoe bucket (1)	3.54 in. (90 mm)	31.9 in. (810 mm)	2.30 in. (58 mm)
Backhoe swing (2)	3.54 in. (90 mm)	10.9 in. (278 mm)	1.97 in. (50 mm)
Backhoe extendable dipperstick (1)	3.78 in. (95 mm)	42.9 in. (1087 mm)	1.77 in. (45 mm)
Backhoe stabilizer (2)	3.54 in. (90 mm)	16.7 in. (425 mm)	1.97 in. (50 mm)
Steering (1) non-powered axle	1.97 in. (50 mm)	9.49 in. (241 mm)	0.98 in. (25 mm)
Steering (1) MFWD	2.56 in. (65 mm)	8.27 in. (210 mm)	1.42 in. (36 mm)

Tires	Rear		
	With non-powered front axle	16.9-24, 8 PR 94	11-, 15-, 8 PR F3
			Front
		10.5L-24, 8 PR 94	11-, 16-, 12 PR F3
With mechanical front-wheel-drive	10.5L-24, 8 PR 94	12.5R0-16, 10 PR	

SAE Operating Weights	
Standard	13,500 lb. (6123 kg)
Cab add	580 lb. (263 kg)
Mechanical front-wheel-drive with fire add	495 lb. (225 kg)
Extendable dipperstick excluding required counterweight add	490 lb. (222 kg)
Optional 400-lb. counterweight add	400 lb. (181 kg)
Optional 650-lb. counterweight add	650 lb. (295 kg)
Optional 250-lb. ball-on counterweight add	250 lb. (113 kg)
Backhoe bucket coupler add	138 lb. (63 kg)

See backhoe and loader performance data for bucket weights.

Loader Buckets	Width	Heap Capacity		Weight
		1.25 cu. yd. (0.96 m <sup>3</sup> )	1.00 cu. yd. (0.77 m <sup>3</sup> )	
Heavy-duty long lip	36 in. (918 mm)	1.30 cu. yd. (1.00 m <sup>3</sup> )	1.25 cu. yd. (0.96 m <sup>3</sup> )	875 lb. (397 kg)
Multipurpose	36 in. (918 mm)	1.13 cu. yd. (0.86 m <sup>3</sup> )	1.00 cu. yd. (0.77 m <sup>3</sup> )	1,450 lb. (658 kg)
	36 in. (918 mm)	1.25 cu. yd. (0.96 m <sup>3</sup> )	1.00 cu. yd. (0.77 m <sup>3</sup> )	1,550 lb. (703 kg)

Auxiliary cutting edge and skid shoes are standard on all buckets.

Backhoe Performance	800 Standard		800 Extendable Dipperstick*	
	Backhoe*	Retracted	Retracted	Extended
Digging force, bucket cylinder	11,990 lb. (53.3 kN)	12,158 lb. (54.1 kN)	12,158 lb. (54.1 kN)	12,158 lb. (54.1 kN)
Digging force, crowd cylinder	8,290 lb. (36.0 kN)	7,796 lb. (34.7 kN)	7,796 lb. (34.7 kN)	5,628 lb. (25.0 kN)
Swing arc	150 degrees	150 degrees	150 degrees	150 degrees
Operator control	two levers	right foot treadle	right foot treadle	right foot treadle
Bucket rotation	190 degrees	190 degrees	190 degrees	190 degrees
Stabilizer angle rearward	15 degrees	15 degrees	15 degrees	18 degrees
Leveling angle	14 degrees	14 degrees	14 degrees	14 degrees

\*Backhoe specifications are with 24-in. x 7.5-cu. ft. (610 mm x 0.21 m<sup>3</sup>) bucket.

Backhoe Buckets	Width	Capacity		Weight
		7.5 cu. ft. (0.21 m <sup>3</sup> )	5.0 cu. ft. (0.14 m <sup>3</sup> )	
Standard duty	24 in. (610 mm)	7.5 cu. ft. (0.21 m <sup>3</sup> )	5.0 cu. ft. (0.14 m <sup>3</sup> )	320 lb. (159 kg)
	24 in. (610 mm)	7.5 cu. ft. (0.21 m <sup>3</sup> )	5.0 cu. ft. (0.14 m <sup>3</sup> )	295 lb. (134 kg)
	24 in. (610 mm)	7.5 cu. ft. (0.21 m <sup>3</sup> )	5.0 cu. ft. (0.14 m <sup>3</sup> )	325 lb. (152 kg)
	24 in. (610 mm)	7.5 cu. ft. (0.21 m <sup>3</sup> )	5.0 cu. ft. (0.14 m <sup>3</sup> )	400 lb. (181 kg)
	24 in. (610 mm)	7.5 cu. ft. (0.21 m <sup>3</sup> )	5.0 cu. ft. (0.14 m <sup>3</sup> )	420 lb. (191 kg)
	24 in. (610 mm)	7.5 cu. ft. (0.21 m <sup>3</sup> )	5.0 cu. ft. (0.14 m <sup>3</sup> )	445 lb. (202 kg)
Severe duty with lift loop	36 in. (914 mm)	10.5 cu. ft. (0.35 m <sup>3</sup> )	7.5 cu. ft. (0.21 m <sup>3</sup> )	510 lb. (231 kg)
	36 in. (914 mm)	10.5 cu. ft. (0.35 m <sup>3</sup> )	7.5 cu. ft. (0.21 m <sup>3</sup> )	362 lb. (164 kg)
	36 in. (914 mm)	10.5 cu. ft. (0.35 m <sup>3</sup> )	7.5 cu. ft. (0.21 m <sup>3</sup> )	425 lb. (193 kg)
	36 in. (914 mm)	10.5 cu. ft. (0.35 m <sup>3</sup> )	7.5 cu. ft. (0.21 m <sup>3</sup> )	455 lb. (206 kg)
Ditch cleaning	36 in. (914 mm)	10.5 cu. ft. (0.35 m <sup>3</sup> )	7.5 cu. ft. (0.21 m <sup>3</sup> )	475 lb. (215 kg)
	36 in. (914 mm)	10.5 cu. ft. (0.35 m <sup>3</sup> )	7.5 cu. ft. (0.21 m <sup>3</sup> )	510 lb. (231 kg)

## Additional Equipment

Key: ● Standard equipment ▲ Optional or special equipment

See your John Deere dealer for further information.

### Engine

- John Deere Model 4645T - 4.5 liter, 85 SAE net hp turbocharged, isolation mounted
- Vertical spin-on engine oil filter
- Spin-on John Deere fuel filter with water separator
- Oil-to-water engine oil cooler
- Air/fuel, -34°F (-37°C)
- Coolant recovery tank
- Surgeplate belt with automatic belt tensioner
- Ticker-type cooling fan
- Extended safety fan guard
- ▲ High ambient temperature engine cooling
- ▲ Dual element dry-type air cleaner
- ▲ Muffler, underhood with curved-end exhaust stack
- ▲ Chrome exhaust extension
- ▲ Electric ether starting aid
- ▲ Engine coolant heater, 1,000 watts

### Power Train

- ▲ Powershift transmission: Torque converter with electrically actuated twist grip P-8-R in 1st through 8th gears
- ▲ Transmission with powershift reverser and torque converter: Fully synchronized four forward, four reverse speeds / Isolation mounted to subframe
- Transmission oil cooler
- Vertical spin-on transmission filter
- Electric forward-neutral-reverse control lever with neutral safety switch interlock
- Electric clutch cutoff on gearshift and loader levers
- Differential lock, electric foot-actuated
- Planetary final drives
- Power-assisted hydraulic service brakes (conforms to SAE J1473): Inboard, wet multi-disc, self adjusting and self equalizing
- Parking/emergency brake with electric switch control (conforms to SAE J1473): Spring applied, hydraulically released wet multi-disc / Independent of service brakes
- Hydraulic power steering with emergency manual mode
- Non-powered front axle
- ▲ Mechanical front-wheel-drive with limited-slip differential: Electric on/off control / Drive-shaft guard / Sealed axle
- 111-15 P3 front tires
- 111-16 P3 front tires
- 12.5-20-18 traction front tires
- 15.5-24 R4 rear tires
- 15.5-24 R4 rear tires
- ▲ Rear wheel spacers for use with chains

### Backhoe

- Backhoe with standard dipperstick, 14-1/2, 6-in. digging depth
- Two-lever (2-lever) backhoe controls
- Three-lever (3-lever) backhoe controls
- Four-lever (4-lever) backhoe controls
- ▲ SAE excavator two-lever backhoe controls
- Backhoe transport lock lever
- Swing back pin stored in operator's station
- Stabilizer valve with two-direction anti-drift valves
- ▲ Flouting stabilizers with dirt pads
- ▲ Extended stabilizers
- ▲ Flouting stabilizers with reversible pads
- ▲ Stabilizer cylinder guards

### Backhoe (continued)

- Linn bucket, with bucket pins
- ▲ Standard-duty backhoe bucket with lift levers
- ▲ Heavy-duty backhoe bucket with lift levers
- ▲ Severe-duty backhoe bucket with lift levers
- ▲ Backhoe bucket coupler for "E," "B," and "C" series John Deere buckets, Case buckets, and Cat buckets
- ▲ Adjustable dipperstick, 3-1/2, 6-in. extension
- ▲ Auxiliary backhoe valve for winches, drums, etc.
- ▲ Auxiliary backhoe valve for hammers, compactors
- ▲ Auxiliary backhoe plumbing for hammers, compactors
- ▲ SAE controlled load-lowering device valve

### Loader

- Hydraulic self leveling
- Return-to-dig feature
- Single-lever control with electric clutch cutoff switch
- Bucket-level indicator
- Loader boom service lock
- ▲ Auxiliary loader hydraulics with two-lever control
- ▲ Loader front coupler
- Linn bucket, with bucket pins
- ▲ Heavy-duty loader buckets with built-in cutting edges, skid plates, and lift levers
- ▲ Multipurpose loader buckets with built-in cutting edges, skid plates, and lift levers

### Hydraulic System

- 30-gpm (136 L/min.), tandem gear pump, open center system
- Independent hydraulic reservoir
- Hydraulic oil cooler
- "V"-ring face seal connectors
- 30 micron vertical spin-on filter

### Electrical

- 12-volt system
- 60-amp alternator
- Single battery with 150-min. reserve capacity and 750 CCA
- ▲ Dual batteries with 200-min. reserve capacity and 1,500 CCA
- Positive terminal battery cover
- Blade-type multi-fused circuits
- Rly-pass start safety cover on starter

### Lights

- Four halogen driving/work lights, 32,500 candle-power each (two front and two rear)
- ▲ Six additional halogen work lights, 32,500 candle-power each (two front, two rear, and two sides)
- Two front and two rear horn signal/lighting
- Two rear stop and tail
- Two rear reflectors
- ▲ Rotating beacon

### Operator's Station

- Modular-design ROPS/OPS canopy with molded seat (conforms to SAE J1068): Isolation mounted
- Left and right hand access
- Slip-resistant steps and ergonomically located handholds
- Molded floor mat
- Restliner
- Coat hook
- Built-in beverage holders
- Built-in Operator's Manual storage compartment with manual

### Operator's Station (continued)

- Interior rearview mirror
- ▲ Outside rearview mirrors
- Hand throttle with fuel economy setting at 2,500 rpm
- Suspended foot throttle
- ▲ Tilt steering
- Hubs
- Key start switch with electric fuel shutoff
- Engine coolant temperature gauge, illuminated electronic, with audible warning
- Oil temperature gauge, illuminated electronic, with audible warning
- Fuel gauge, illuminated electronic
- Digital display of engine hours, engine rpm, and system voltage
- Monitor system with audible and visual warnings: Engine air restriction indicator / Engine oil pressure indicator with audible warning / Hydraulic filter restriction indicator / Parking brake on/off indicator with audible warning / Seat belt indicator
- Non-suspension vinyl swivel seat without armrests
- ▲ Suspension vinyl swivel seat with armrests and lumbar support
- ▲ Suspension fabric swivel seat with armrests and lumbar support
- ▲ Air suspension vinyl swivel seat with armrests and lumbar support
- ▲ Air suspension fabric swivel seat with armrests and lumbar support
- 2-in. seat belt with retractors
- ▲ 2-in. seat belt with retractors
- ▲ Cab: Restliner, dome light, left and right cab door, 3-point safety glass, one rear and one front windshield wiper, fresh air intake heater/deshaker/prewheater (60,000-80-hr.) [11.7 kW] heater, and 60-amp alternator standard / Front windshield wiper, air conditioning (24,000-Blower, 2.5 kW output and 210-draw 9.13-ku refrigerant), 90-amp alternator, and AM/FM weatherband radio optional
- ▲ Ride control

### Overall Vehicle

- One-piece unitized construction mainframe
- Vehicle foldovers, two front and one rear
- Remote service lock for front axle
- Rigid mounted front bumper
- ▲ 400-lb. (181 kg) front counterweight
- ▲ 600-lb. (270 kg) front counterweight
- ▲ 800-lb. (360 kg) front counterweight
- ▲ 1,100-lb. (502 kg) front counterweight
- ▲ 1,400-lb. (635 kg) front counterweight
- Fuel tank, 56 gal. (136 L), ground level fueling
- Two-position entry-lift hand
- ▲ Front grille screen
- Remote procedure for instrument panel, engine access doors, and fuel tank
- Reverse warning alarm: Switchable to 67 dB(A) or 111 dB(A)
- Dust-resistant rear loaders
- ▲ Rear fender extensions
- ▲ Front fenders\*
- ▲ SWB emblem
- ▲ Rental decal kit
- ▲ Special color paint\*
- ▲ Quarter cab\*



Net engine power is with standard equipment including air cleaner, exhaust system, alternator, and cooling fan, at standard conditions per SAE J1349 and DIN 75 020, using 90, 2-0 fuel at 31.0°C ambient. No derating is required up to 10,000-ft. (3,050 m). Gross power is without cooling fan.

Specifications and design subject to change without notice. Whenever applicable, specifications are in accordance with SAE standards. Except where otherwise noted, these specifications are based on a unit with 15.5L, 24, 8 P80-hp (90cc) 111-16, 12.5R P3 front tires, 1.12-cu. yd. (0.86 m<sup>3</sup>) loader bucket, and 24-in. x 7.0-cu. ft. (810 mm x 0.21 m<sup>3</sup>) backhoe bucket.

