



# 510D

## BACKHOE LOADER

**SAE Net  
Horsepower**

95 hp  
(71 kW)

**Digging  
Depth**

16 ft. 5 in.  
(5.00 m)

**Loader  
Lift**

7,300 lb.  
(3310 kg)

Model shown may include options

## ENGINE

John Deere engineered and manufactured. Replaceable wet type cylinder liners provide superior heat dissipation, longer life. High strength alloy heads have replaceable valve seat inserts. The forged steel, 5-main bearing crankshaft is statically and dynamically balanced for smooth operation. Cast aluminum pistons provide good heat transfer and pistons are sprayed with cooling oil for longer life.

**Engine:** John Deere 4045T

Rated power at 2200 rpm.....	95 SAE net hp (71 kW)
	100 SAE gross hp (75 kW)
Cylinders.....	4
Displacement.....	276 cu. in. (4.524 L)
Fuel consumption, typical.....	1.6 to 2.6 gal./hr. (6.0 to 9.8 L/h)
Torque rise.....	25 percent
Maximum net torque.....	268 lb.-ft. (363 Nm)
Lubrication.....	pressure system w/full flow filter and cooler
Air cleaner.....	dual stage dry type with safety element and precleaner
Electrical system.....	12 volt with 95-amp alternator

## TRANSMISSION

John Deere designed and built 4-speed helical gear, synchronized in all four gears, collar shift transmission with hydraulic reverser. Uses single stage, dual phase, 11-inch (280 mm) torque converter with 2.23:1 stall ratio.

## TRAVEL SPEEDS

Gear	Forward		Reverse	
	mph	(km/h)	mph	(km/h)
1	3.4	5.5	3.9	6.3
2	5.9	9.5	6.8	10.9
3	12.6	20.3	14.5	23.3
4	19.7	32.7	22.6	36.4

With 21L-24 rear tires

## FINAL DRIVES

Heavy-duty, inboard mounted planetary type. Evenly distribute axle shock loads over three gears that run in a cooling oil bath.

## BRAKES

**Hydraulic wet disk service brakes** are mounted inboard and are pressure cooled and lubricated. They're self-adjusting, self-equalizing, require no periodic service. Individual pedals allow them to be applied together or separately.

**Parking/emergency brake** is an independent system that is spring-applied, hydraulically released and controlled by an electric switch on the control console. A mechanical V-groove band applies pressure on differential ring gear. All brakes conform to SAE J1473.

## CAPACITIES

	U.S.
Fuel tank.....	34 gal. (129 L)
Engine coolant.....	17 qt. (16 L)
Engine oil including filter.....	9 qt. (8.5 L)
Torque converter and reverser system.....	14 qt. (13 L)
Hydraulic system.....	21 gal. (79 L)
Transaxle with MFWD.....	6 gal. (23 L)

## STEERING

Hydrostatic power steering gives superior control at all speeds. Excellent steering torque allows easy maneuvering with heavy loads. Power steering conforms to SAE J1151 and emergency steering SAE J53.

Non-powered axle	
Curb turning radius with brakes.....	11 ft. 7 in. (3.53 m)
without brakes.....	13 ft. 5 in. (4.10 m)
Bucket clearance circle with brakes.....	33 ft. 6 in. (10.22 m)
without brakes.....	37 ft. 3 in. (11.34 m)
Steering wheel turns, stop to stop.....	2.2 to 2.9
Mechanical-front-wheel drive	
Curb turning radius with brakes.....	11 ft. 7 in. (3.53 m)
without brakes.....	13 ft. 8 in. (4.17 m)
Bucket clearance circle with brakes.....	31 ft. 6 in. (9.59 m)
without brakes.....	35 ft. 8 in. (10.88 m)
Steering wheel turns, stop to stop.....	2.5
Axle oscillation, stop to stop, both axles.....	22 degrees

Axle ratings:	Static	Dynamic	SAEJ43
Front.....	56,000 lb. (25 300 kg)	56,000 lb. (25 300 kg)	21,100 lb. (9500 kg)
Rear.....	51,000 lb. (23 100 kg)	68,000 lb. (30 800 kg)	16,800 lb. (7600 kg)

## HYDRAULICS

System.....	closed center
Pressure, main relief.....	2755 psi (19 000 kPa)
Pump.....	radial pistons
Flow at 2200 rpm.....	35 gpm (133 L/min.)
Filter, return oil.....	10 micron, spin-on, replaceable element

## CYLINDERS

	Bore		Stroke		Rod	
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
Loader boom (2).....	3.54	90	29.84	758	1.77	45
Loader bucket (1).....	3.94	100	28.19	718	1.97	50
Backhoe boom (1).....	5.00	127	42.72	1085	2.50	64
Backhoe crowd (1).....	4.53	115	34.57	878	2.48	63
Backhoe bucket (1).....	3.54	90	31.00	788	1.97	50
Backhoe swing (2).....	3.94	100	9.49	241	1.97	50
Backhoe extendable						
dipper (1).....	2.50	64	48.00	1220	1.25	32
Backhoe stabilizer (2).....	3.94	100	19.96	507	1.97	50
Steering (1) regular axle.....	1.97	50	9.50	241	0.98	25
Steering (1) MFWD.....	2.36	60	7.90	202	0.98	25

## TIRES

Rear	Front
19.5L-24, 10 PR R4.....	11L-16, 12 PR F3
19.5L-24, 12 PR R4.....	11L-16, 12 PR F3
21L-24, 10 PR R4.....	14.5/75-16.1, 10 PR F3
With mechanical-front-wheel drive	
21L-24, 10 PR R4.....	12.00-16.5, 8 PR, lug tread
18.4-28L, 12 PR R4.....	14-17.5, 8 PR

## OPERATING WEIGHTS

SAE	
510D.....	16,000 lb. (7260 kg)
cab adds.....	500 lb. (227 kg)
mechanical-front-wheel drive adds.....	245 lb. (111 kg)
extendable dipperstick with required counterweight adds.....	1182 lb. (536 kg)
optional front counterweight adds.....	250 lb. (113 kg) *
backhoe bucket coupler adds.....	200 lb. (91 kg) *

See backhoe and loader performance data for bucket weights



## QUICK COUPLER

Change buckets quickly, effortlessly with a John Deere quick coupler. The coupler provides power-dig and truck-loading capabilities and is available as an option from the factory. Pick up all John Deere "C" and "D" series buckets. Case 580D, E-, and K-series buckets will retro-fit with the optional Case pin-and-washer kit supplied by your John Deere dealer.



## EXTENDABLE DIPPERSTICK

Increase your digging depth and your reach by five feet with the John Deere extendable dipperstick, available from the factory or as a field-installed option. Inner box features lifetime wear strips and should be lubricated with regular grease. Dipperstick also contains a lock pin. Properly-sized hydraulic attachments may be used with dipperstick extended or retracted.



## OPERATOR'S STATION

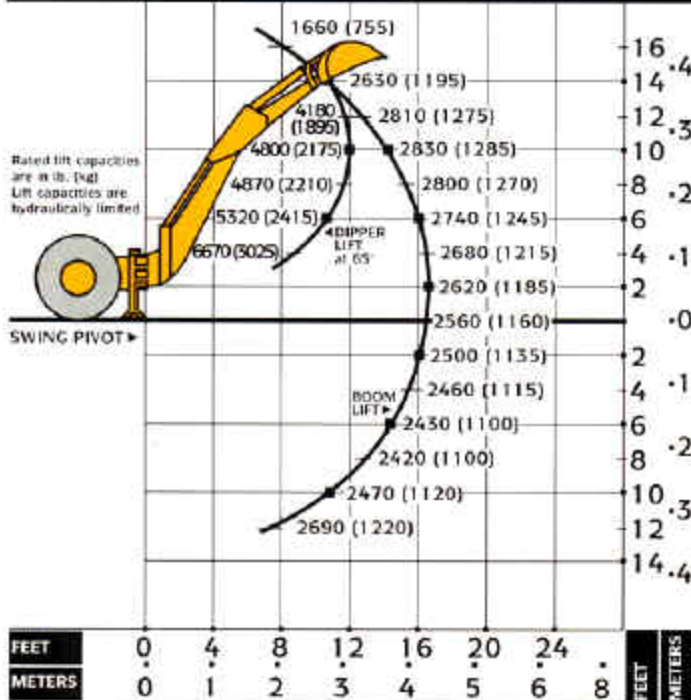
The quietest cab in the industry with a DBA level of less than 80. Large entrance doors on both sides allow convenient entrance and exit. Doors open within machine width so they aren't susceptible to damage. 4700 sq. in. (30 322 cm<sup>2</sup>) of window area opens for excellent ventilation.



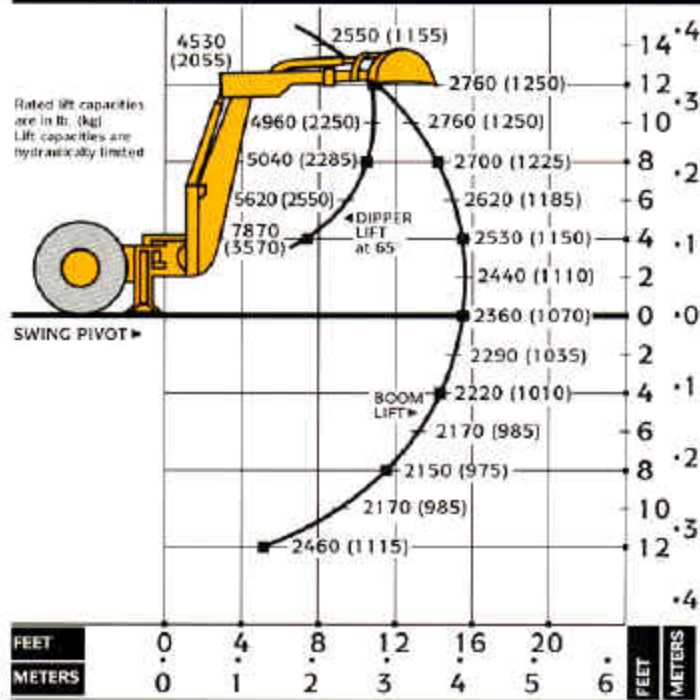
## ELECTRONIC MONITORING

Audible and two-stage visible warnings alert you to potential problems. Electronic parking brake located on console is automatically applied when engine is shut off. Mechanical-Front-Wheel-Drive button can be easily applied with a flip of the switch. Convenient rotary dial controls air-conditioning temperature when equipped with the optional factory air conditioning.

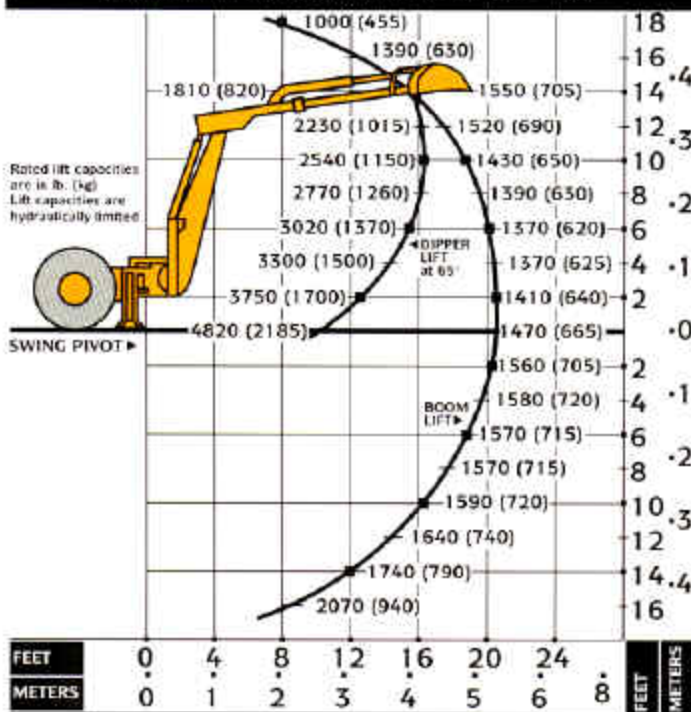
## LIFT CAPACITY Backhoe with standard dipperstick. Based on SAE J31.



## LIFT CAPACITY Backhoe with 5 ft. (1.52 m) dipperstick, retracted. Based on SAE J31.



## LIFT CAPACITY Backhoe with 5 ft. (1.52 m) dipperstick, extended. Based on SAE J31.



## BACKHOE BUCKETS

	Width		Capacity		Weight	
	in.	(mm)	cu. ft.	(m <sup>3</sup> )	lb.	(kg)
Standard-duty	12	(305)	2.5	(0.07)	244	(111)
	18	(457)	5.1	(0.14)	322	(146)
	24	(610)	7.5	(0.21)	370	(168)
	30	(762)	10.0	(0.28)	410	(186)
	36	(914)	9.9	(0.28)	430	(195)
Heavy-duty	12	(305)	2.5	(0.07)	258	(117)
	18	(457)	5.1	(0.14)	334	(151)
	24	(610)	7.5	(0.21)	396	(180)
	30	(762)	10.0	(0.28)	444	(201)
	36	(914)	10.0	(0.28)	470	(214)
Extra heavy-duty	18	(457)	5.1	(0.14)	352	(164)
	24	(610)	7.5	(0.21)	424	(192)
	30	(762)	10.0	(0.28)	474	(215)
Ditch cleaning	36	(914)	10.0	(0.28)	370	(168)
	36	(914)	14.5	(0.41)	500	(235)

## LOADER BUCKETS

Loader:	Width		Heaped Capacity		Weight	
	in.	(mm)	cu. yd.	(m <sup>3</sup> )	lb.	(kg)
General purpose	92	(2340)	1.3	(1.0)	796	(361)
Heavy-duty long lip	92	(2340)	1.5	(1.15)	1080	(490)
Long lip	89	(2270)	1.25	(0.96)	750	(340)
Multipurpose	92	(2340)	1.25	(0.96)	1560	(708)

## LOADER PERFORMANCE

	w/1.3 cu. yd. (1.0 m <sup>3</sup> ) Heavy-Duty Long Lip Bucket
Operator control	single lever
Breakout force	10410 lb. (46.3 kN)
Lifting capacity, full height	7500 lb. (3310 kg)
a) Height to bucket hinge pin, max	11 ft. 1 in. (3.38 m)
b) Dump clearance, bucket at 45 degrees	8 ft. 9 in. (2.67 m)
c) Bucket dump angle, max	45 degrees
d) Reach at full height, bucket at 45 degrees	29.1 in. (739 mm)
e) Rollback angle at ground level	40 degrees
f) Digging depth below ground, bucket level	4 in. (100 mm)
Raising time to full height	4.4 sec.
Bucket dump time	1.0 sec.
Bucket lowering time (power down)	3.0 sec.

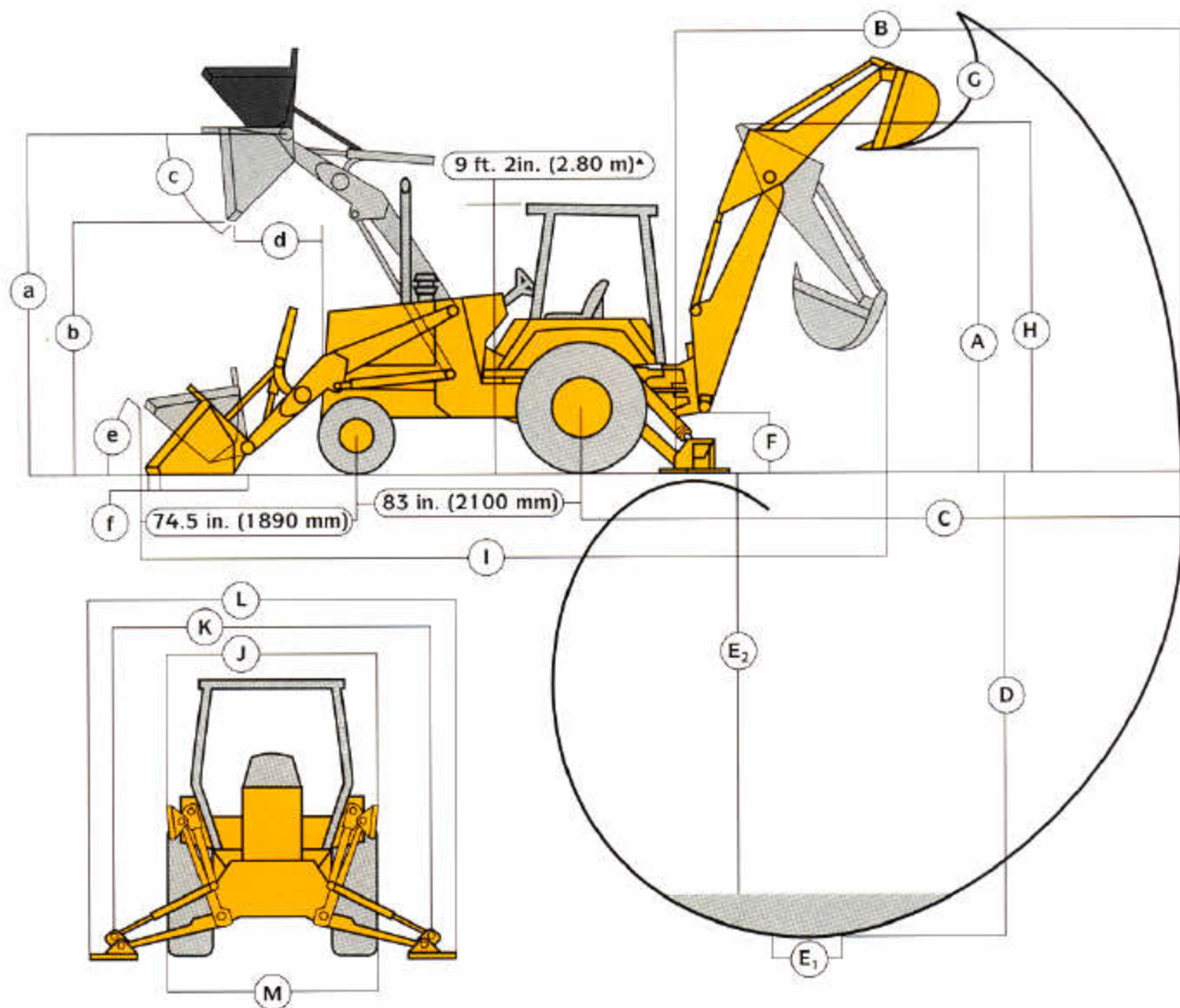
	w/1.25 cu. yd. (0.95 m <sup>3</sup> ) General Purpose Long Lip Bucket
Operator control	single lever
Breakout force	9900 lb. (44.0 kN)
Lifting capacity, full height	7050 lb. (3195 kg)
a) Height to bucket hinge pin, max	11 ft. 1 in. (3.38 m)
b) Dump clearance, bucket at 45 degrees	8 ft. 5 in. (2.58 m)
c) Bucket dump angle, max	45 degrees
d) Reach at full height, bucket at 45 degrees	34 in. (868 mm)
e) Rollback angle at ground level	40 degrees
f) Digging depth below ground, bucket level	4 in. (100 mm)
Raising time to full height	4.4 sec.
Bucket dump time	1.0 sec.
Bucket lowering time (power down)	3.0 sec.

	w/1.5 cu. yd. (1.15 m <sup>3</sup> ) Heavy-Duty Long Lip Bucket
Operator control	single lever
Breakout force	9900 lb. (44.0 kN)
Lifting capacity, full height	7050 lb. (3195 kg)
a) Height to bucket hinge pin, max	11 ft. 1 in. (3.38 m)
b) Dump clearance, bucket at 45 degrees	8 ft. 7 in. (2.63 m)
c) Bucket dump angle, max	45 degrees
d) Reach at full height, bucket at 45 degrees	31 in. (787 mm)
e) Rollback angle at ground level	40 degrees
f) Digging depth below ground, bucket level	4 in. (100 mm)
Raising time to full height	4.4 sec.
Bucket dump time	1.0 sec.
Bucket lowering time (power down)	3.0 sec.

	w/1.25 cu. yd. (0.95 m <sup>3</sup> ) Multi-purpose Bucket
Operator control	single lever
Breakout force	9700 lb. (43.1 kN)
Lifting capacity, full height	7000 lb. (3170 kg)
a) Height to bucket hinge pin, max	11 ft. 1 in. (3.38 m)
b) Dump clearance, bucket at 45 degrees	8 ft. 7 in. (2.63 m)
c) Bucket dump angle, max	45 degrees
d) Reach at full height, bucket at 45 degrees	28.5 in. (724 mm)
e) Rollback angle at ground level	40 degrees
f) Digging depth below ground, bucket level	5 in. (125 mm)
Raising time to full height	4.4 sec.
Bucket dump time	1.0 sec.
Bucket lowering time (power down)	3.0 sec.

# DIMENSIONS

[a-f] See Loader Performance



## ▲ ROPS and cab

### Key:

A. Loading height, truck loading position	12 ft. 7 in. (3.84 m)
B. Reach from center of swing mast	19 ft. 11 in. (6.07 m)
C. Reach from center of rear axle	23 ft. 8 in. (7.21 m)
D. Maximum digging depth	16 ft. 8 in. (5.07 m)
E. Digging depth (SAE):	
(1) 2-ft. (610 mm) flat bottom	16 ft. 6 in. (5.03 m)
(2) 8-ft. (2440 mm) flat bottom	15 ft. 7 in. (4.74 m)
F. Ground clearance, minimum	13 in. (330 mm)
G. Bucket rotation	160 or 180 degrees
H. Transport height	12 ft. 1 in. (3.68 m)
I. Overall length, transport	23 ft. 4 in. (7.11 m)
J. Stabilizer width - transport	7 ft. 8 in. (2.34 m)
K. Stabilizer spread - operating	9 ft. 10 in. (3.00 m)
L. Stabilizer overall width - operating	11 ft. 4 in. (3.45 m)
M. Width over tires	85 in. (2.15 m)

### Backhoe Standard Dipperstick\*

### Extendable Dipperstick

Retracted	Extended
12 ft. 1 in. (3.69 m)	15 ft. (4.58 m)
19 ft. 3 in. (5.87 m)	23 ft. 11 in. (7.29 m)
23 ft. (7.01 m)	27 ft. 8 in. (8.43 m)
15 ft. 11 in. (4.86 m)	20 ft. 10 in. (6.34 m)
15 ft. 11 in. (4.86 m)	20 ft. 8 in. (6.30 m)
14 ft. 10 in. (4.51 m)	20 ft. (6.09 m)
13 in. (330 mm)	13 in. (330 mm)
160 or 180 degrees	160 or 180 degrees
12 ft. 11 in. (3.94 m)	12 ft. 11 in. (3.94 m)
23 ft. (7.01 m)	23 ft. (7.01 m)
7 ft. 8 in. (2.34 m)	7 ft. 8 in. (2.34 m)
9 ft. 10 in. (3.00 m)	9 ft. 10 in. (3.00 m)
11 ft. 4 in. (3.45 m)	11 ft. 4 in. (3.45 m)
85 in. (2.15 m)	85 in. (2.15 m)

## BACKHOE PERFORMANCE

Digging force, bucket cylinder (power dig position)	11,100 lb. (49.5 kN)	11,230 lb. (49.9 kN)	11,230 lb. (49.9 kN)
Digging force, crowd cylinder	7600 lb. (33.8 kN)	8390 lb. (37.0 kN)	5430 lb. (24.2 kN)
Swing arc	180 degrees	180 degrees	180 degrees
Operator control	Two levers	Right foot treadle	Right foot treadle
Bucket positions	8 or 17 deg. rollback	8 or 18 deg. rollback	12 or 21 deg. rollback
Stabilizer angle rearward	14.5 degrees	14.5 degrees	14.5 degrees
Lifting capacity, maximum	6000 lb. (2700 kg)	6400 lb. (2900 kg)	3200 lb. (1450 kg)
Leveling angle	13 degrees	13 degrees	13 degrees

\*Backhoe specifications are with 24-in. x 8.8 cu. ft. (610 mm x 0.25 m<sup>3</sup>) bucket.

## ADDITIONAL STANDARD EQUIPMENT

### Engine:

Enclosed safety fan guard  
Conforms to SAE J1308  
Engine coolant to -34°F (-37°C)  
Oil-to-water engine oil cooler  
Under hood muffler with vertical curved end exhaust stack

### Power Train:

Cooler: oil-to-air for reverser/torque converter system, transaxle and brakes

Electric shuttle control  
Electric clutch cutoff  
Differential lock with padded pedal

### Backhoe:

Dirt foot stabilizer pad  
Independent side console mounted stabilizer control  
Patented high penetration, high wear resistant bucket tooth  
Remote backhoe transport lock  
Two-lever backhoe control

### Loader:

Bucket level indicator  
Built-in lift hooks on bucket

Hydraulic self-leveling  
Return to dig  
Single lever control with electric clutch cutoff

### Operator's Station:

Built-in Operator's Manual storage compartment and manual  
Built-in beverage and Thermos bottle holder  
Coat hook

Electronic monitor system with audible and visual warning:  
Air cleaner restriction  
Alternator

Coolant temperature  
Engine oil pressure  
Hydraulic filter indicator  
Torque converter temperature

Fuel gauge  
Hand throttle and padded foot throttle

Headliner  
Horn  
Interior mounted rearview mirror  
Conforms to SAE J985

Key start switch with electric fuel shutoff  
Lights, halogen driving/working 35,200 candlepower (375 737 lux)  
Two front, two rear  
Stop and tail (two rear)  
Flashing and turn signals, two front, two rear  
Conforms to SAE J99

Modular design ROPS/FOPS canopy  
Conforms to SAE J1040

Molded floor mat

Non-suspension seat

Flip-up armrests

Conforms to SAE J899

Park brake indicator

Rear reflectors

Slip resistant safety steps and ergonomically located handrails

Conforms to SAE J185

2-in. (51 mm) seat belt with retractors

Conforms to SAE J386

Tachometer/hourmeter

### Overall Vehicle:

Built-in tie downs

Dent resistant rear fenders  
Engine side shields with convenient "tip up" service access  
Remote grease bank for front axle  
Front counterweight 750 lb. (340 kg)  
Vandal protection, locking provision for:

Engine access doors  
Fuel tank cap  
Instrument panel  
Reverse alarm  
Conforms to SAE J994, J1446  
Toolbox

### Electrical:

Blade-type multi-fused circuits  
Bypass start safety cover at starter  
Positive terminal battery covers  
Single battery, 180-min. reserve capacity

### Hydraulics:

Independent isolation mounted stabilizer valve  
Two direction stabilizer anti-drift valves  
"O" ring face seal connectors

## OPTIONAL OR SPECIAL EQUIPMENT

### Engine:

Engine coolant heater 1000 watts  
Remote mounted ether starting aid

### Power Train:

Mechanical-front-wheel drive

Driveshaft guard  
Electric on/off control  
Limited slip differential  
Wet clutch engagement

### Backhoe:

Alternate stabilizer pads  
Auxiliary function backhoe hydraulics  
Backhoe bucket coupler  
Backhoe controls

Case pattern with three-lever foot swing

Ford pattern with four levers  
SAE excavator pattern\*

Extendable dipperstick  
Five-foot extension

Lifetime wearstrips  
Extra function backhoe valve and controller

Heavy-duty and extra heavy-duty backhoe buckets  
Built-in lift eyes

Stabilizer cylinder guards\*

### Loader:

Alternate buckets  
Higher capacity general purpose  
Long-lip configuration  
Multipurpose

Auxiliary function loader hydraulics  
Bolt-on auxiliary cutting edge  
Third function loader hydraulics  
Loader boom service lock\*

### Operator's Station:

Cab  
Cab pressurizer

25-in. Hg pressurization  
Deluxe headliner  
Deluxe "eyeball" dome light  
Door that opens within vehicle width

Fresh air intake heater/defroster/pressurizer

40,000 Btu/hr (11.7 kW) heater  
Conforms to SAE J1505, J1555D

Fresh air precleaner

Front and rear wipers

Front windshield washers

Air conditioning

27,000 Btu/hr (7.9 kW) capacity

Conforms to SAE J1505

Deluxe suspension seat

Front quarter cab

Front doors only

Radio

3-in. (76 mm) retractable seat belt

### Overall Vehicle:

Dual batteries  
Fan blast dust shields  
Fire extinguisher  
Rigid supported front bumper

Front counterweight  
250 lb. (113 kg)

High-flotation tires

Front grille guard\*

Front grille screens\*

Rotating beacon

SMV emblem

Special color paint

Auxiliary toolbox

Chrome exhaust extension

Fender extensions

\*See your John Deere dealer for further information

## THE JDAvantEDGE

JDAvantEdge is a wealth of support programs, parts systems and dealer resources, all designed to give you the edge. This package of special benefits is a major reason why John Deere offers the "best value" for your equipment dollar.

**Best parts support** - Twelve regional parts depots in North America and others around the world put parts support near your job no matter where in the world it is.

A computerized FLASH™ parts locating system linking these depots to dealerships can find out-of-stock parts in a hurry and get them into your hands fast. Usually within 24 hours.

**Best service backup** - Dealer service technicians are regularly schooled, at our modern facility in Davenport, Iowa, or by professionals in the field, to diagnose quickly and repair efficiently.

If they are stumped, a phone call to DTAC (Dealer Technical Assistance Center) puts them in touch with a staff of pros at the factory who help them find a solution quickly.

**Best dealers** - Your John Deere dealer is an important contributor to the JDAvantEdge. He or she is committed to being the best equipment supplier you can work with.

This is a dollars-and-cents commitment in parts inventory, in service facilities, in field service trucks. It's a sweat-and-blood commitment in dedicated, skilled and highly trained and motivated personnel in each and every department at the dealership.

But what sets John Deere dealers apart from all the rest is something more, a factor somewhat difficult to measure ... a caring attitude, and a sincere desire to be the best at meeting the needs of each individual customer.

**John Deere Finance Plans** - Whether you rent, lease or buy John Deere equipment, your dealer can explain the John Deere options available. One-stop options that let you free up operating capital, keep other lines of credit open. More solid benefits of the JDAvantEdge.

**Best protection** - In addition to the new equipment warranty that meets or exceeds the competition, SECURE® extended coverage, an optional service product for John Deere equipment, is available for repair coverage after the warranty concludes. Full machine or power train coverage is available for a variety of time periods to meet your needs. Consult your dealer for availability and details.

Net engine power is with standard equipment including air cleaner, exhaust system, alternator, and cooling fan, at standard conditions per SAE J1549 and DIN 70 020, using No. 2-D fuel at 55 API gravity. No derating is required up to 10,000 feet (3050 m) altitude. Gross power is without cooling fan.

Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with SAE standards. Except where otherwise noted, these specifications are based on a unit with 19.5L-24, 10 PR R4 rear tires, 11L-16, 12 PR F3 front tires, 1.3 cu. yd. (1.0 m³) loader bucket, 24 m x 8.8 cu. ft. (610 mm x 0.25 m³) heavy-duty backhoe bucket.

