510 P

Excavator

JOHN DEERE

MEET YOUR NEXT EXCAVATOR

Wondering what's in store for your operation? The smooth, powerful, and efficient 510 P-Tier Excavator can be just what you've had in mind. Customer-inspired standards include a powerful and durable 9.0L engine coupled with electric E-fans for maximum fuel efficiency, time- and cost-saving service points, and a camera array with LED-surround lighting to see your jobsites like never before. Factory-installed options such as a heated/cooled leather seat and flexible grade-management solutions — including fully integrated SmartGrade™ — are designed to further exceed your expectations.

NEW ELECTRIC E-FANS

MAXIMIZE COOLING & MINIMIZE FUEL BURN

Easy on operators and the bottom line
Designed to ease service access and cut maintenance costs by up to 10 percent, the 510 P-Tier also consumes 12-percent less fuel in truck-loading applications compared to previous models. That's a savings of over one gallon per hour based on average annual usage data.

Power performer
Streamlined PowerTech™ 9.0L engine provides power on demand while electric E-fans maximize cooling performance and minimize fuel burn compared to hydraulic cooling systems.

At home in the seat
Standard heated air-suspension high-back seat slides independent of the pilot-control console. Optional premium air-suspension leather seat is actively cooled and thermally heated. Wide expanses of front, side, and overhead glass plus a redesigned hood contour provide clear sightlines.

Seeing is believing
Standard camera array is integrated into the main monitor to supplement visibility to the sides, rear, and around the machine. Standard LED surround lighting improves camera image quality in low-light conditions.

GRADE-MANAGEMENT OPTIONS
ARE FACTORY READY & DEALER BACKED

It's smart to get good grades
Whether you're new to the game or want our most cutting-edge grade-management technology, John Deere offers an economical solution to fit your needs. Make your choice from 2D guidance to SmartGrade 3D control including overdig protection and in-cab real-time distance to target. All grade-management solutions are factory ready and backed by your Deere dealer, including service, warranty, and financing.

Experience the advantages
Deere grade-control solutions help reduce labor, improve accuracy, enhance speed, and save on material compared to excavators without grade-management tech. And they help operators of all experience levels to achieve excellent results.

Grade Guidance
Grade Guidance arms operators with elevation and position of bucket cutting edge relative to target plane (2D) or design surface (3D). It's perfect for precision excavation projects, including digging trenches for pipes, shaping ditches or slopes, or excavating structure foundations. And since it doesn't require GPS access, it's a reliable system for areas where GPS reception is poor.

Master the move
Variable-width undercarriage and optional counterweight-removal device provide flexibility when the 510 P-Tier Excavator is transported to and between jobsites.

Ready to work
Weighing in at nearly 51 metric tons, the 510 P-Tier can capably handle buckets with fill capacities up to five cubic yards and above, for exceptional productivity in mass-excavation and site-work applications.

In command
Ergonomically correct short-throw pilot levers provide smooth, predictable fingertip control with less movement or effort. Grade-control functions are integrated into the factory pilot levers for easy operation.

Control pattern
Designed to accommodate multiple operators with the simple flip of a lever, control pattern-change valve comes standard.

Fluid fundamentals
Large fuel and diesel exhaust fluid (DEF) tanks let you run longer between routine refills. Fluid-level sight gauges are conveniently located and can be checked at a glance. Engine-oil pan is designed to remove easily and cleanly.

Grip without slipping
Upper-structure handrails provide three points of contact when accessing the engine compartment. Slip-resistant surfaces help secure footing on and around the machine.

Pivotal strength
Bucket-to-arm pivot joint features a heat-treated pin and flanged bushing made of forged steel, to double joint life in sandy digging conditions. High-strength floating-pin design extends pin-case hardening depth by 175 percent, boosting wear life and easing serviceability.

DURABLE COMPONENTS
HELP EXTEND WEAR LIFE

Stress management
Thick-plate single-sheet mainframe, box-section track frames, and double-seal swing bearing deliver rock-solid durability. Three welded bulkheads within the boom resist torsional stress.

Connected machines
John Deere construction equipment comes with in-base connectivity — free from subscriptions or annual renewals. Analyze critical machine data, track utilization, review diagnostic alerts, and more from **the John Deere Operations Center™.** The Operations Center also enables John Deere Connected Support™, which uses data from thousands of connected machines to proactively address issues before they arise. With your approval, your dealer can also remotely monitor machine health, diagnose problems, and even update machine software without a trip to the jobsite.*

*Availability varies by region and product. Options not available in every country.

510 P-TIER EXCAVATOR SPECIFICATIONS

While general information, pictures, and descriptions are provided, some illustrations and text may include product options and accessories NOT AVAILABLE in all regions, and in some countries products and accessories may require modifications or additions to ensure compliance with the local regulations of those countries.

Engine	**510 P-TIER**		
Manufacturer and Model	John Deere PowerTech™ 6090		
Non-Road Emission Standard	EPA Final Tier 4/EU Stage IV		
Net Rated Power (ISO 9249)	274 kW (367 hp) at 2,000 rpm		
Cylinders	6		
Displacement	9.0 L (549 cu. in.)		
Off-Level Capacity	70% (35 deg.)		
Aspiration	Turbocharged, air-to-air charge-air cooler		
Cooling			
Reversing electric variable-speed fan drive			
Powertrain			
2-speed propel with automatic shift			
Maximum Travel Speed			
Low	3.9 km/h (2.4 mph)		
High	5.5 km/h (3.4 mph)		
Drawbar Pull	33 537 kg (73,937 lb.)		
Hydraulics			
Open center, load sensing			
Main Pumps	2 variable-displacement pumps		
Maximum Rated Flow	400 L/m (106 gpm) x 2		
Pilot Pump	1 gear		
Maximum Rated Flow	34 L/m (8.9 gpm)		
Pressure Setting	3900 kPa (566 psi)		
System Operating Pressure			
Circuits			
Implement	31 900 kPa (4,627 psi)		
Travel	35 300 kPa (5,120 psi)		
Swing	28 400 kPa (4,119 psi)		
Power Boost	35 300 kPa (5,120 psi)		
Controls	Pilot levers, short stroke, low-effort hydraulic pilot controls with shutoff lever		
Cylinders			
Heat-treated, chrome-plated, polished cylinder rods; hardened steel (replaceable bushings) pivot pins			
	Bore	*Rod Diameter*	*Stroke*
Boom (2)	170 mm (6.7 in.)	115 mm (4.5 in.)	1590 mm (62.6 in.)
Arm (1)	190 mm (7.5 in.)	130 mm (5.1 in.)	1940 mm (76.4 in.)
Bucket (1)	170 mm (6.7 in.)	120 mm (4.7 in.)	1325 mm (52.2 in.)
Electrical			
Number of Batteries (12 volt)	2		
Battery Capacity	1,400 CCA		
Alternator Rating	Dual, 300 amp		
Number of Alternators	2		
Work Lights	9 LED: 1 mounted on frame, 2 mounted on boom, 2 mounted on top of cab, 1 rear-facing top of cab, 1 mounted on counterweight, 1 mounted on left-side handrail, and 1 mounted on right-side handrail		
Undercarriage			
Planetary final drives with axial-piston motors			
Rollers (each side)			
Carrier	3		
Track	9		
Shoes, Triple Semi-Grousers (each side)	53		
Track			
Adjustment	Hydraulic		
Guides	Front and center		
Chain	Sealed and lubricated		

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Ground Pressure	**510 P-TIER**
With Grouser Shoes	
750-mm (30 in.) Single	71.9 kPa (10.4 psi)
900-mm (36 in.) Triple Semi	60.7 kPa (8.8 psi)

Swing Mechanism	
Swing	
Speed	9.5 rpm
Torque	148 000 Nm (109,159 lb.-ft.)

Serviceability

Refill Capacities	
Fuel Tank	675 L (178 gal.)
Cooling System	47.3 L (12.5 gal.)
Engine Oil With Filter	30.2 L (8 gal.)
Hydraulic Tank	310 L (82 gal.)
Hydraulic System	510 L (135 gal.)

Refill Capacities *(continued)*	
Gearbox	
Swing (each)	6.5 L (1.7 gal.)
Travel (each)	11 L (2.9 gal.)
Diesel Exhaust Fluid (DEF) Tank	71 L (18.8 gal.)

Operating Weights

With Full Fuel Tank; 79-kg (175 lb.) Operator; 2.34-m³ (3.06 cu. yd.), 1370-mm (54 in.), 2031-kg (4,478 lb.) Bucket; 3.9-m (12 ft. 10 in.) Arm; 8400-kg (18,519 lb.) Counterweight With Removal Device; and 900-mm (36 in.) Triple Semi-Grouser Shoes

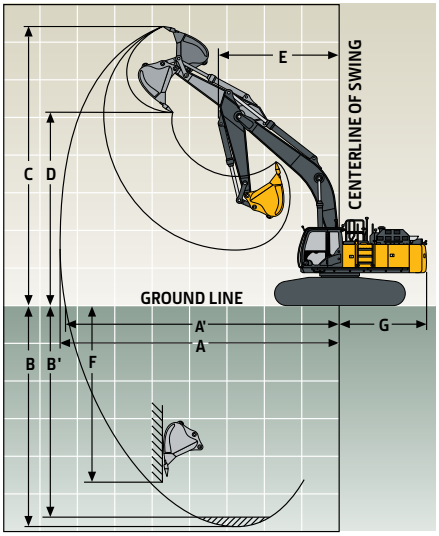
Operating Weight	50 750 kg (111,885 lb.)

Component Weights	
Undercarriage With Grouser Shoes	
750-mm (30 in.) Single	18 323 kg (40,395 lb.)
900-mm (36 in.) Triple Semi	18 978 kg (41,839 lb.)
7.0-m (23 ft. 0 in.) 1-Piece Boom (with arm cylinder)	4499 kg (9,919 lb.)

Component Weights *(continued)*	
Arm With Bucket Cylinder and Linkage	
3.4 m (11 ft. 2 in.)	2539 kg (5,598 lb.)
3.9 m (12 ft. 10 in.)	2640 kg (5,820 lb.)
Boom-Lift Cylinders (2), Total Weight	840 kg (1,853 lb.)

Operating Dimensions

	Arm Length	*3.4 m (11 ft. 2 in.)*	*3.9 m (12 ft. 10 in.)*
	Arm Digging Force		
	SAE	219 kN (49,199 lb.)	199 kN (44,783 lb.)
	ISO	226 kN (50,801 lb.)	204 kN (45,925 lb.)
	Bucket Digging Force		
	SAE	269 kN (60,477 lb.)	269 kN (60,477 lb.)
	ISO	301 kN (67,564 lb.)	301 kN (67,564 lb.)
A	Maximum Reach	12.06 m (39 ft. 7 in.)	12.49 m (41 ft. 0 in.)
A'	Maximum Reach at Ground Level	11.84 m (38 ft. 10 in.)	12.28 m (40 ft. 3 in.)
B	Maximum Digging Depth	7.77 m (25 ft. 6 in.)	8.27 m (27 ft. 2 in.)
B'	Maximum Digging Depth at 2.44-m (8 ft. 0 in.) Flat Bottom	7.63 m (25 ft. 0 in.)	8.14 m (26 ft. 8 in.)
C	Maximum Cutting Height	11.06 m (36 ft. 3 in.)	11.16 m (36 ft. 7 in.)
D	Maximum Dumping Height	7.65 m (25 ft. 1 in.)	7.77 m (25 ft. 6 in.)
E	Minimum Swing Radius	4.84 m (15 ft. 11 in.)	4.81 m (15 ft. 9 in.)
F	Maximum Vertical Wall	6.59 m (21 ft. 7 in.)	6.98 m (22 ft. 11 in.)
G	Tail-Swing Radius	3.67 m (12 ft. 0 in.)	3.67 m (12 ft. 0 in.)



510 P-TIER

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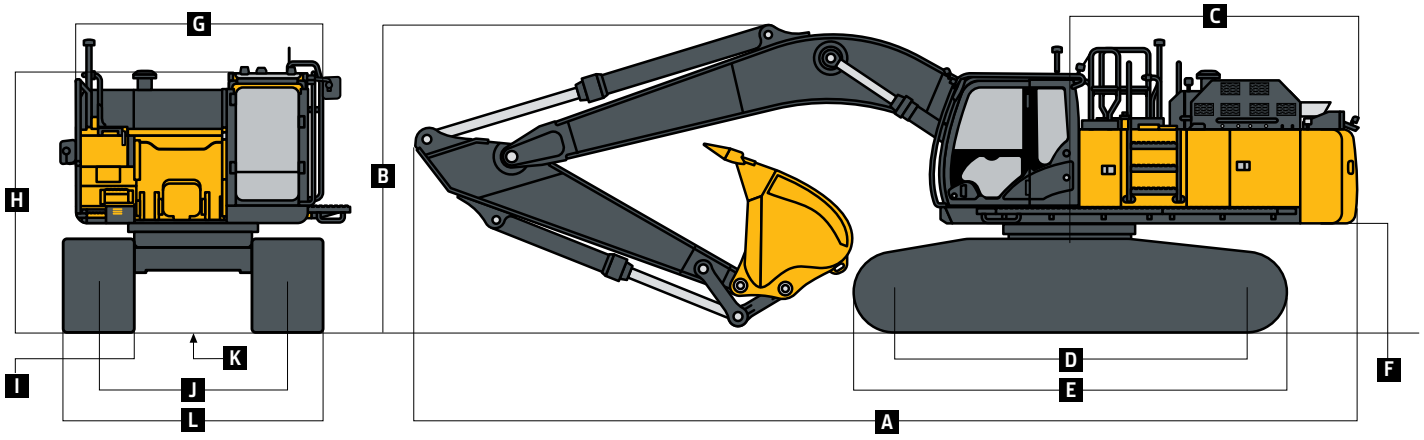
Machine Dimensions		510 P-TIER	
	Arm Length	*3.4 m (11 ft. 2 in.)*	*3.9 m (12 ft. 10 in.)*
A	Overall Length With Arm	12.01 m (39 ft. 5 in.)	12.01 m (39 ft. 5 in.)
B	Overall Height With Arm	3.48 m (11 ft. 5 in.)	3.50 m (11 ft. 6 in.)
C	Rear-End Length/Swing Radius	3.67 m (12 ft. 0 in.)	3.67 m (12 ft. 0 in.)
D	Distance Between Idler/Sprocket Centerline	4.47 m (14 ft. 8 in.)	4.47 m (14 ft. 8 in.)
E	Undercarriage Length	5.47 m (17 ft. 11 in.)	5.47 m (17 ft. 11 in.)
F	Counterweight Clearance	1.36 m (4 ft. 6 in.)	1.36 m (4 ft. 6 in.)
G	Upperstructure Width	3.48 m (11 ft. 5 in.)	3.48 m (11 ft. 5 in.)
H	Cab Height	3.33 m (10 ft. 11 in.)	3.33 m (10 ft. 11 in.)
I	Track Width With Grouser Shoes	750-mm (30 in.) Single / 900-mm (36 in.) Triple Semi	750-mm (30 in.) Single / 900-mm (36 in.) Triple Semi
J	Gauge Width		
	Operating Position	2.89 m (9 ft. 6 in.)	2.89 m (9 ft. 6 in.)
	Transport Position	2.39 m (7 ft. 10 in.)	2.39 m (7 ft. 10 in.)
K	Ground Clearance	0.74 m (29 in.)	0.74 m (29 in.)
L	Overall Width With Grouser Shoes		
	750-mm (30 in.) Single		
	Operating Position	3.64 m (11 ft. 11 in.)	3.64 m (11 ft. 11 in.)
	Transport Position	3.14 m (10 ft. 4 in.)	3.14 m (10 ft. 4 in.)
	900-mm (36 in.) Triple Semi		
	Operating Position	3.79 m (12 ft. 5 in.)	3.79 m (12 ft. 5 in.)
	Transport Position	3.29 m (10 ft. 10 in.)	3.29 m (10 ft. 10 in.)



Lift Capacities

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with standard gauge and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of minimum tipping loads. All lift capacities are based on ISO 10567 (with power boost).

	HORIZONTAL DISTANCE FROM CENTERLINE OF ROTATION									
	3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
LOAD POINT HEIGHT	**Over Front**	**Over Side**	**Over Front**	**Over Side**	**Over Front**	**Over Side**	**Over Front**	**Over Side**	**Over Front**	**Over Side**
With 7.0-m (23 ft. 0 in.) boom, 3.4-m (11 ft. 2 in.) arm, and 900-mm (36 in.) triple semi-grouser shoes, less bucket										
7.5 m (25 ft.)							**11 640 (25,540)**	11 640 (25,210)		
6.0 m (20 ft.)							**12 260 (26,730)**	11 460 (24,700)	**10 910 (21,510)**	8540 (18,350)
4.5 m (15 ft.)			**20 770 (44,540)**	**20 770 (44,540)**	**15 810 (34,180)**	15 420 (33,290)	**13 310 (28,920)**	11 050 (23,830)	**11 870 (25,910)**	8360 (17,990)
3.0 m (10 ft.)			**23 750 (54,320)**	21 920 (47,350)	**18 000 (38,910)**	14 530 (31,390)	**14 490 (31,430)**	10 580 (22,840)	**12 460 (27,110)**	8110 (17,480)
1.5 m (5 ft.)			**15 460 (37,020)**	**15 460 (37,020)**	**19 620 (42,470)**	13 840 (29,870)	**15 460 (33,520)**	10 170 (21,960)	12 600 (27,150)	7880 (17,000)
Ground Line			**18 500 (42,980)**	**18 500 (42,980)**	**20 280 (43,950)**	13 430 (28,970)	**15 950 (34,590)**	9890 (21,340)	12 420 (26,760)	7720 (16,650)
–1.5 m (–5 ft.)	**13 570 (30,700)**	**13 570 (30,700)**	**25 530 (56,570)**	20 440 (43,950)	**19 920 (43,190)**	13 280 (28,640)	**15 770 (34,150)**	9760 (21,070)	12 350 (26,650)	7660 (16,550)
–3.0 m (–10 ft.)	**22 020 (49,800)**	**22 020 (49,800)**	**23 620 (51,250)**	20 640 (44,390)	**18 490 (40,020)**	13 340 (28,770)	**14 630 (31,510)**	9800 (21,160)		
–4.5 m (–15 ft.)	**24 600 (53,120)**	**24 600 (53,120)**	**19 710 (42,450)**	**19 710 (42,450)**	**15 580 (33,380)**	13 620 (29,400)	**11 570**	10 080		

Lift Capacities *(continued)* — 510 P-TIER

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with standard gauge and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of minimum tipping loads. All lift capacities are based on ISO 10567 (with power boost).

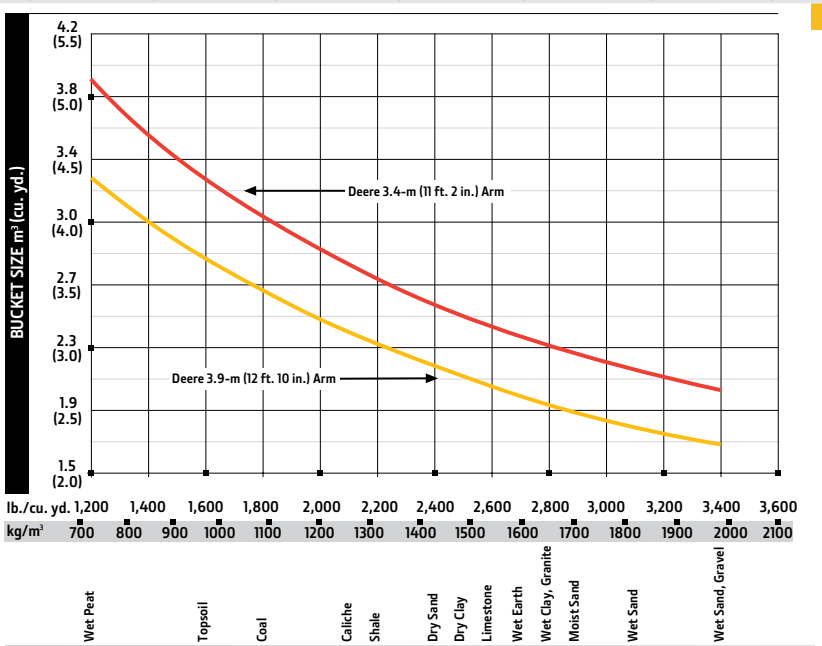
	HORIZONTAL DISTANCE FROM CENTERLINE OF ROTATION									
	3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
LOAD POINT HEIGHT	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 7.0-m (23 ft. 0 in.) boom, 3.9-m (12 ft. 10 in.) arm, and 900-mm (36 in.) triple semi-grouser shoes, less bucket										
7.5 m (25 ft.)									**7570**	**7570**
6.0 m (20 ft.)							**11 520 (25,120)**	**11 520** (24,930)	**10 660 (22,170)**	8610 (18,510)
4.5 m (15 ft.)					**14 830 (32,070)**	**14 830 (32,070)**	**12 630 (27,450)**	11 120 (23,990)	**11 330 (24,710)**	8380 (18,050)
3.0 m (10 ft.)			**23 650 (50,850)**	22 360 (48,280)	**17 130 (37,030)**	14 670 (31,680)	**13 900 (30,140)**	10 620 (22,910)	**12 000 (26,110)**	8110 (17,470)
1.5 m (5 ft.)			**20 270 (48,150)**	**20 270** (45,110)	**18 990 (41,100)**	13 880 (29,950)	**15 000 (32,530)**	10 160 (21,920)	12 570 (27,080)	7840 (16,900)
Ground Line			**20 220 (46,810)**	**20 200** (43,730)	**19 970 (43,280)**	13 370 (28,830)	**15 690 (34,010)**	9820 (21,190)	12 340 (26,600)	7640 (16,470)
–1.5 m (–5 ft.)	**13 570 (30,620)**	**13 570 (30,620)**	**25 040 (57,490)**	20 180 (43,390)	**19 960 (43,280)**	13 130 (28,310)	**15 750 (34,120)**	9640 (20,790)	12 230 (26,360)	7530 (16,250)
–3.0 m (–10 ft.)	**20 270 (45,750)**	**20 270 (45,750)**	**24 590 (53,320)**	20 300 (43,660)	**18 930 (40,970)**	13 130 (28,300)	**14 980 (32,330)**	9620 (20,760)	**11 780**	7570
–4.5 m (–15 ft.)	**27 700 (59,840)**	**27 700 (59,840)**	**21 220 (45,780)**	20 660 (44,460)	**16 590 (35,680)**	13 330 (28,770)	**12 840 (27,300)**	9800 (21,200)		
–6.0 m (–20 ft.)			**15 600 (32,950)**	**15 600 (32,950)**	**11 870 (24,560)**	**11 870 (24,560)**				

Buckets

A full line of buckets is offered to meet a wide variety of applications. Digging forces are with power boost. Buckets are equipped with John Deere TK-Series teeth. A variety of teeth are available through John Deere Parts. Optional side cutters add 150 mm (6 in.) to bucket widths. Capacities are SAE heaped ratings.

Type Bucket	Bucket Width		Bucket Capacity		Bucket Weight		Bucket Dig Force (SAE)		Bucket Dig Force (ISO)		Arm Dig Force 3.4 m (11 ft. 2 in.) (SAE)		Arm Dig Force 3.4 m (11 ft. 2 in.) (ISO)		Arm Dig Force 3.9 m (12 ft. 10 in.) (SAE)		Arm Dig Force 3.9 m (12 ft. 10 in.) (ISO)		Bucket Pin to Cutting-Edge Radius		Bucket Pin to Tooth-Tip Radius		Number of Teeth
	mm	in.	m^3	cu. yd.	kg	lb.	kN	lb.	kN	lb.	kN	lb.	kN	lb.	kN	lb.	kN	lb.	mm	in.	mm	in.	
Heavy Duty	1067	42.0	1.47	1.92	1629	3,591	269.0	60,477	300.5	67,564	218.8	49,199	226.0	50,801	199.2	44,783	204.3	45,925	1675	66	1849	72.8	4
	1220	48.0	1.74	2.27	1803	3,975	269.0	60,477	300.5	67,564	218.8	49,199	226.0	50,801	199.2	44,783	204.3	45,925	1675	66	1849	72.8	5
	1372	54.0	2.01	2.60	1924	4,242	269.0	60,477	300.5	67,564	218.8	49,199	226.0	50,801	199.2	44,783	204.3	45,925	1675	66	1849	72.8	5
	1524	60.0	2.28	3.00	2090	4,608	269.0	60,477	300.5	67,564	218.8	49,199	226.0	50,801	199.2	44,783	204.3	45,925	1675	66	1849	72.8	6
	1676	66.0	2.55	3.34	2195	4,839	269.0	60,477	300.5	67,564	218.8	49,199	226.0	50,801	199.2	44,783	204.3	45,925	1675	66	1849	72.8	6
	1829	72.0	2.82	3.70	2360	5,203	269.0	60,477	300.5	67,564	218.8	49,199	226.0	50,801	199.2	44,783	204.3	45,925	1675	66	1849	72.8	7
Severe Duty	1537	60.5	2.28	3.00	2222	4,899	262.9	59,102	293.7	66,028	217.1	48,800	224.1	50,389	197.7	44,451	202.8	45,584	1675	66	1892	74.5	5

Bucket Selection Guide*



* Contact your John Deere dealer for optimum bucket and attachment selections. These recommendations are for general conditions and average use. Does not include optional equipment such as thumbs or couplers. Larger buckets may be possible when using light materials, for flat and level operations, less compacted materials, and volume loading applications such as mass-excavation applications in ideal conditions. Smaller buckets are recommended for adverse conditions such as off-level applications, rocks, and uneven surfaces. Bucket capacity indicated is SAE heaped.

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JOHN DEERE