

321D LCR

Hydraulic Excavator



Engine

Engine Model	Cat® C6.4 ACERT™	
Net Flywheel Power	110 kW	148 hp

Weights

Operating Weight – Long Undercarriage	23 530 kg	51,875 lb
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- Reach boom, R2.9B1 (9 ft 6 in) Stick, 0.9 m³ (1.18 yd³) Bucket, 600 mm (24 in) Shoes

Operating Weight – Long Undercarriage 2	24 180 kg	53,308 lb
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- Reach boom, R2.9B1 (9 ft 6 in) Stick, 0.9 m³ (1.18 yd³) Bucket, 800 mm (32 in) Shoes

321D LCR Hydraulic Excavator

The D Series incorporates innovations for improved performance and versatility.

Compact Radius

The 321D LCR is a “Compact Radius” machine developed so that it can work in the narrow job-site. The cylindrical upper frame and cylindrical operator station, allow the 321D LCR to rotate in the narrower job-sites. **pg. 4**

C6.4 with ACERT™ Technology

- ✓ ACERT™ Technology works at the point of combustion to optimize engine performance and provide low exhaust emissions to meet U.S. EPA Tier 3 emission regulations, with exceptional performance capabilities and proven reliability. **pg. 5**

Hydraulics

The hydraulic system has been designed to provide reliability and outstanding controllability. An optional Tool Control System provides enhanced flexibility. **pg. 6**

Work Tools – Attachments

- ✓ A variety of work tools, including buckets, couplers, hammers, and shears are available through Cat® Work Tools. **pg. 11**

Versatility

Caterpillar offers a wide variety of factory-installed attachments that enhance performance and job site management. **pg. 12**

The Caterpillar 321D LCR excavator provides all the elements to give you the lowest cost to own and operate. At the end of the day, it all comes down to how much work you got done and how much did it cost you. Caterpillar and the 321D LCR offer you the tools to help lower your owning and operating costs.



Structures

Caterpillar® design and manufacturing techniques assure outstanding durability and service life from these important components. **pg. 7**

Operator Comfort

- ✓ Provides maximum space, wider visibility and easy access to switches. The monitor is a full-color graphical display that allows the operator to understand the machine information easily. Overall, the new cab provides a comfortable environment for the operator. **pg. 8**

Booms, Sticks and Bucket Linkages

The bucket linkage pins on the mass excavation configuration have been enlarged to improve reliability and durability. **pg. 10**

Service and Maintenance

- ✓ Fast, easy service has been designed in with extended service intervals, advanced filtration, convenient filter access and user-friendly electronic diagnostics for increased productivity and reduced maintenance costs. **pg. 13**

Complete Customer Support

Your Cat® dealer offers a wide range of services that can be set up under a customer support agreement when you purchase your equipment. The dealer will help you choose a plan that can cover everything from machine configuration to eventual replacement. **pg. 14**



✓ *New Feature*

Compact Radius

The 321D LCR delivers exceptional performance and comfort.



Compact Radius. The 321D LCR features a compact radius design, which makes it ideal for working in space restricted areas such as: close to buildings, road construction – limiting lane closures or logging roads. The tail swing is just 1.68 m (5'6") as compared to the 2.75 m (9'0") on the 320D. When rotated 90 degrees and working over the side, a minimal amount of counterweight extends beyond the track width.

Operator Confidence. Due to the 321D LCR's compact working envelope, operators can work confidently knowing that the counterweight will not swing into any object behind them.



Comfort. The cab on the 321D LCR is a comfortable place to work, with low sound levels, good visibility and convenient access to switches and controls. The 321D LCR cab offers many of the same amenities and options found in the cab of the 320D/320D LRR.

Working Envelope. To further minimize the working envelope, the boom is repositioning more towards the center of the machine as compared to a standard excavator. This reduced the front swing radius when the boom is pulled all the way up and the stick brought in completely. This design also increases the lift capacity of the 321D LCR over the front as it has a better mechanical advantage when compared to a standard excavator.

C6.4 with ACERT™ Technology

The Cat® C6.4 gives the 321D LCR exceptional power and fuel efficiency unmatched in the industry for consistently high performance in all applications.



Cat C6.4. The Cat C6.4 with ACERT™ Technology introduces a series of evolutionary, incremental improvements that provide breakthrough engine technology. The building blocks of ACERT Technology are fuel delivery, air management and electronic control. ACERT Technology optimizes engine performance while meeting U.S. EPA Tier 3 emission regulations. With its proven technology, robust components and precision manufacturing, you can count on this engine to power up at start time and keep working productively all shift long.

Performance. The 321D LCR, equipped with the C6.4 engine with ACERT™ Technology, provides 7% more power as compared to the 3066TA in the 321C LCR. The additional power delivers a speed and efficiency advantage in high production applications.

Automatic Engine Speed Control.

The two-stage, one-touch control maximizes fuel efficiency and reduces sound levels.

ADEM™ A4 Engine Controller.

The ADEM A4 electronic control module manages fuel delivery to get the best performance per liter of fuel used. The engine management system provides flexible fuel mapping, allowing the engine to respond quickly to varying application needs. It tracks engine and machine conditions while keeping the engine operating at peak efficiency.



Electronic Control Module.

The Electronic Control Module (ECM) works as the “brain” of the engine’s control system, responding quickly to operating variables to maximize engine efficiency. Fully integrated with sensors in the engine’s fuel, air, coolant, and exhaust systems, the ECM stores and relays information on conditions such as rpm, fuel consumption, and diagnostic information.

Fuel Delivery. The Cat C6.4 features electronic controls that govern the fuel injection system. Multiple injection fuel delivery involves a high degree of precision. Precisely shaping the combustion cycle lowers combustion chamber temperatures, generating fewer emissions and optimizing fuel combustion. This translates into more work output for your fuel cost.

Hydraulics

Cat® hydraulics deliver power and precise control to keep material moving.



Component Layout. To optimize efficiency of hydraulic performance, the hydraulic components are located close together, which reduces friction loss and pressure drops in the lines.

System Pressure. System pressure has been increased to 35 000 kPa (5,076 psi), which attributes to improved performance:

- Increased stick and bucket forces (up 7% higher than the 321C LCR) to better handle those tight digging conditions

- More drawbar pull (206 kN/46,322 lb) to provide more ability to climb slopes, easier spot turns and improved travel in poor underfoot conditions
- More lift capacity, generally over the front where you are generally hydraulically limited

Heavy Lift. The 321D LCR features the addition of a heavy lift, which increases system pressure to 36 000 kPa (5,220 psi), giving even more lift capacity over the front. Heavy Lift is activated by depressing the soft switch on the right hand console. As the pressure increases, the engine speed is reduced, which allows better control while lifting objects.

Pilot System. The pilot pump is independent from the main pumps and controls the front linkage, swing and travel operations.

Hydraulic Cross Sensing System.

The hydraulic cross sensing system utilizes each of two hydraulic pumps to 100 percent of engine power, under all operating conditions. This improves productivity with faster implement speeds and quicker, stronger pivot turns.

Boom and Stick Regeneration Circuit.

Boom and stick regeneration circuit saves energy during boom-down and stick-in operation which increases efficiency, reduces cycle times and pressure loss for higher productivity, lower operating costs and increased fuel efficiency.

Auxiliary Hydraulic Valve.

The auxiliary valve is standard on the 321D LCR. Control Circuits are available as attachments, allowing for operation of high and medium pressure tools such as shears, grapples, hammers, pulverizers, multi-processors and vibratory plate compactors.

Hydraulic Cylinder Snubbers.

Snubbers are located at the rod-end of the boom cylinders and both ends of the stick cylinders to cushion shocks while reducing sound levels and extending component life.

Structures

321D LCR is designed to handle the most rugged operating conditions, while providing long life and value.

Robust Undercarriage. A solid foundation built tough to absorb the stresses of everyday work.

- Rollers and idlers are sealed and lubricated to extend service life.
- Track links are assembled and sealed with grease to decrease internal bushing wear and increase life by as much as 25%, when compared to dry seal undercarriages.
- Spring recoil system stroke has been increased to better relieve excess track tension, which can occur when material builds up between the track and sprocket.

Rugged Structures. Structural components and the undercarriage are the backbone of the machine's durability. Caterpillar places a lot of emphasis on the machine's durability during the designing and manufacturing of its excavators.

- Up to 95% of the structural welds are welded by robots, which achieve up to three times the penetration of a manual weld and improving overall durability of the machine.
- The 321D LCR's main frame utilizes high-tensile strength steel and a one-piece swing table, which improves strength and reliability.
- The carbody has a X-shaped, box section design to resist bending and twisting forces.
- Track roller frames are press-formed in a pentagonal shape for additional strength.



Engine Hood. The 321D LCR features a one-piece, flat engine hood. The engine hood opens backwards and is located in a place that does not obstruct access to inspection points in the engine compartment.

Counterweight. The counterweight is split into two pieces for improved serviceability. The top piece weighs approximately 2268 kg (5,000 lb), and the bottom weighs 3832 kg (8,450 lb). The counterweight is a rounded cast structure that minimizes the amount of overhang.

Operator Comfort

Caterpillar offers the most intuitive and easy to operate excavators while providing great all around visibility and exceptional operator comfort.



Operator Station. The layout of the interior has been redesigned to maximize operator comfort and reduce operator fatigue.

- Frequently used switches have been relocated for easier access.
- Consoles and armrests have been redesigned for better comfort and adjustability.
- More seat options – choose from the standard mechanical suspension seat, or the optional air suspension seat with heater. Both provide excellent comfort.

Standard Cab Equipment. To enhance operator comfort and productivity, the cab includes a lighter, drink holder, coat hook, service meter, literature holder, magazine rack and storage compartment.

Joystick Control. Joystick controls have low lever effort and are designed to match the operator’s natural wrist and arm position.

Hydraulic Activation Control Lever. For added safety, this lever must be in the operate position to activate the machine control functions.

Climate Control. Climate control adjusts temperature and flow, and determines which air outlet is best in each situation with a touch of a button.

Cab Exterior. The cab is made of pressed-steel plates. The pillars, beams and crossbeam, are formed box-shape, which improves the resistance of fatigue and vibration.

Hand Control Pattern Changer (Optional). Switches the joystick pattern between ISO and SAE patterns. For easy access, the pattern changer is located in the cab, underneath the floor mat. In order to change positions, simply remove the bolt, slide the lever into the appropriate location, then secure the bolt.



Sliding Door. The cab door slides alongside the cab and takes less space to open and close than a hinged door. This unique design allows the operator to easily get in and out of the cab when working next to objects or walls.

Skylight. An enlarged skylight with sunshade provides excellent visibility and ventilation.

Monitor. The monitor is a full color Liquid Crystal Display that gives you vital operating and performance information, alerts in text, all in a simple, easy to navigate format.

Default Display. Three analog gauges, fuel level, hydraulic oil temperature and coolant temperature, are displayed in this area.

Main Menu. Four menu options to choose from:

Settings – Adjust monitor settings, select work tool or choose video mode (when equipped with a camera)

Maintenance – Displays service intervals and hours accumulated since last serviced.

Performance – Displays machine performance attributes such as Engine Speed, Coolant and Hydraulic Oil Temperature.

Service – Allows access to machine parameters for service intervals, diagnostic information and information related to the machines software.

Event Display. Machine information is displayed in this area with the icon and language.

Multi-information Display. This area is reserved for displaying various information which is convenient for the operator. The “CAT” logo is displayed when no information is available to be displayed.

Booms, Sticks and Bucket Linkages

Built for Performance and long service life, Caterpillar® booms and sticks are large, welded, box-section structures with thick, multi-plate fabrications in high stress areas.



Bucket Linkage. The power link improves durability, increases machine-lifting capability in key lifting positions and with the integrated lift-eye it is easier to use than compared to the previous power link. The lift eye also gives you the optimum lift performance. It allows you to lower the load point, which maximizes the use of the boom cylinders.

Front Linkage Options. The Reach Boom allows excellent all-around versatility and a large working envelope. It can be equipped with the following two sticks:

- R2.9B1 – performs well in a mid-range working envelope
- R2.5B1 – a good match when the job requires a larger bucket or a hammer

Work Tools – Attachments

The 321D LCR has an extensive selection of work tools to optimize machine performance.

Wide Variety of Work Tools. Caterpillar offers a complete line of work tools to match all of your application needs:

- Hammers – matched to Cat machines for optimum performance
- Thumbs, Stiff Link, Full Rotation – transforms your 321D LCR into a versatile material handling machine
- Grapples – choose from a large variety of grapples that best suit your application
- Multi-processors – does the work of many types of demolition tools by use of interchangeable jaws
- Shears – features 360 degree rotation and high force to weight ratio
- Pulverizers – ideally suited for rapid, non-explosive demolition applications
- Vibratory Plate Compactors – provide superior compaction force in a reliable, low maintenance package
- Rippers – perfectly suited for trenching and pipeline applications where conditions aren't favorable to traditional ripping methods

Caterpillar Buckets. The most extensive choice of buckets that can optimize machine performance and match your application needs.

- General Purpose Buckets – for digging in low impact, moderately abrasive materials such as dirt, loam, gravel and clay.
- Heavy-Duty Buckets – for use in abrasive applications such as mixed dirt, clay and rock.
- Heavy-Duty power Buckets – for use in abrasive applications where breakout force and cycle times are critical – good for materials such as mixed dirt, clay and rock.
- Ditch Cleaning Buckets – wide and shallow for ditch cleaning, bank forming and finishing.



Caterpillar Ground Engaging Tools

(GET). Choose from a wide variety of tips that maximize bucket and machine performance. Sidecutters and sidebar protectors are also available.



Pin Grabber Plus Hydraulic Pin Grabber

Couplers. Multiply the versatility and utility of 321D LCR.

- Hydraulic Pin Grabber Plus – allows quick and easy tool changes without having to leave the cab. Picks up a large variety of tools equipped with standard pins.
- Dedicated Coupler – no loss of tip radius, maximizing the breakout forces on your 321D LCR.

Versatility

A wide variety of optional factory-installed attachments are available to enhance performance and improve job site management.



Auxiliary Hydraulic Options. Allows you to configure your 321D LCR to meet your work tools needs, while increasing its versatility.

- Single Function Circuit – suited for tools that require one-way flow with both pumps, such as hammers, vibratory plate compactors.
- Double Function Circuit – suited for tools that require two-way flow, utilizing one pump, such as thumbs or non-rotation grapples or shears.
- Tool Control System
 - Accommodates single or double function tools, as well as rotating tools when equipped with medium pressure.

- Stores pressure and flow information for up to 10 tools
- Cat tools selectable that have preset flows and pressures
- Shortcut button on right hand console, making tool selection easier.

Product Link. Both the PL121 and PL321 are available as factory installed attachments. PL121 gives you Asset Watch, which includes the following features:

- Engine hours
- Machine location
- Time based fences (when the machines can operate)

- Geo-based fences (boundaries that the machine can operate) PL321 gives you all of the features listed for PL121, plus the ability to include Health and Maintenance Watch.
- Health Watch
 - Codes from on-board EDM's/Sensors
 - Estimated Fuel Consumption
 - Fuel Watch
- Maintenance Watch
 - Preventative Maintenance Planning
 - Preventative Maintenance Checklists
 - Overdue PM Notification
 - PM History Recording



Machine Security. An optional Machine Security System is available from the factory on the 321D LCR. This system controls when the machine can be operated and utilizes specific keys to prevent unauthorized machine use, a significant theft deterrent.

More Attachments. The 321D LCR offers the most options available to equip your machine to best match your application and work environment requirements. From track shoe size to guarding packages to operator comfort options, the 321D LCR offers more options.

Service and Maintenance

Simplified service and maintenance features save you time and money.

Ground Level Service. The design and layout of the 321D LCR was made with the service technician in mind. Many service locations are easily accessible at ground level allowing critical maintenance to get done quickly and efficiently.

Air Filter/Radiator Compartment.

The left rear service door allows easy access to the engine radiator, oil cooler and air-to-air-aftercooler.

A wire mesh screen is provided between the aftercooler and radiator/oil cooler, where there is enough clearance to blow off debris using a wand. The air filter, also located within this compartment, features a double-element construction for superior cleaning efficiency. When the air cleaner plugs, a warning is displayed on the monitor screen inside the cab.

Access to the washer tank and maintenance points for the electric components, such as the battery, circuit breaker and controller are also located in this compartment. The jump-start receptacle, which is an attachment for the cold weather package, is located near the battery.

Pump Compartment. A service door on the right side allows for ground level access to the hydraulic pump, case drain and pilot filters.



Greasing Points. A concentrated remote greasing block on the boom delivers grease to hard-to-reach locations on the front.

Anti-Skid Plate. Anti-skid plate covers top of storage box and upper structure to prevent slipping during maintenance.

Diagnostics and Monitoring.

The 321D LCR is equipped with S•O•SSM sampling ports and hydraulic test ports for the hydraulic system, engine oil, and for coolant. A test connection for the Cat Electronic Technician (Cat ET) service tool is located in the cab.

Extended Service Interval. 321D LCR service and maintenance intervals have been extended to reduce machine service time and increase machine availability.

Complete Customer Support

Cat® dealer services help you operate longer with lower costs.



Product Support. You will find nearly all parts at our dealer parts counter. Cat dealers utilize a worldwide computer network to find in-stock parts to minimize machine down time. Save money with remanufactured components.

Machine Selection. Make detailed comparisons of the machines you are considering before you buy. What are the job requirements, machine attachments and operating hours? What production is needed? Your Cat dealer can provide recommendations.

Customer Support Agreements.

Cat dealers offer a variety of product support agreements, and work with customers to develop a plan the best meets specific needs. These plans can cover the entire machine, including attachments, to help protect the customer's investment.

Operation. Improving operating techniques can boost your profits. Your Cat dealer has videotapes, literature and other ideas to help you increase productivity, and Caterpillar offers certified operator training classes to help maximize the return on your investment.

Maintenance Services. Repair option programs guarantee the cost of repairs up front. Diagnostic programs such as Scheduled Oil Sampling, Coolant Sampling and Technical Analysis help you avoid unscheduled repairs.

Replacement. Repair, rebuild, or replace? Your Cat dealer can help you evaluate the cost involved so you can make the right choice.

SAFETY.CAT.COM™.

Engine

Engine Model	Cat® C6.4 ACERT™	
Net Flywheel Power	110 kW	148 hp
Net Power – ISO 9249	110 kW	148 hp
Net Power – SAE J1349	110 kW	148 hp
Net Power – EEC 80/1269	110 kW	148 hp
Bore	102 mm	4.02 in
Stroke	130 mm	5.12 in
Displacement	6.4 L	389 in ³

- The 321D LCR meets U.S. EPA Tier 3 emissions requirements.
- Net flywheel power advertised is the power available at the flywheel when the engine is equipped with fan, air cleaner, muffler and alternator.
- No engine power derated below 2300 m (7,500 ft).

Weights

Operating Weight – Long Undercarriage	23 530 kg	51,875 lb
Operating Weight – Long Undercarriage 2	24 180 kg	53,308 lb

- Reach boom, R2.9B1 (9 ft 6 in) Stick, 0.9 m³ (1.18 yd³) Bucket, 600 mm (24 in) Shoes
- Reach boom, R2.9B1 (9 ft 6 in) Stick, 0.9 m³ (1.18 yd³) Bucket, 800 mm (32 in) Shoes

Service Refill Capacities

Fuel Tank Capacity	330 L	87 gal
Cooling System	25 L	6.6 gal
Engine Oil	30 L	8 gal
Swing Drive	8 L	2.1 gal
Final Drive (each)	8 L	2.1 gal
Hydraulic System (including tank)	208 L	55 gal
Hydraulic Tank	120 L	32 gal
Hydraulic Tank (Including suction pipe)	133 L	35 gal

Track

Number of Shoes Each Side – Long Undercarriage	49
Number of Track Rollers Each Side – Long Undercarriage	8
Number of Carrier Rollers Each Side – Long Undercarriage	2

Swing Mechanism

Swing Speed	11.5 rpm	
Swing Torque	61.8 kN·m	45,612 lb ft

Drive

Maximum Drawbar Pull	206 kN	46,311 lb
Maximum Travel Speed	5.7 km/h	3.5 mph

Hydraulic System

Main Implement System – Maximum Flow (2x)	205 L/min	54 gal/min
Max. pressure – Equipment	35 000 kPa	5,076 psi
Max. pressure – Equipment – Heavy	36 000 kPa	5,221 psi
Max. pressure – Travel	35 000 kPa	5,076 psi
Max. pressure – Swing	25 000 kPa	3,626 psi
Pilot System – Maximum flow	32.4 L/min	9 gal/min
Pilot System – Maximum pressure	3900 kPa	566 psi
Boom Cylinder – Bore	120 mm	4.7 in
Boom Cylinder – Stroke	1260 mm	49.6 in
Reach Stick Cylinder – Bore	140 mm	5.5 in
Reach Stick Cylinder – Stroke	1518 mm	59.8 in
B1 Family Bucket Cylinder – Bore	120 mm	4.7 in
B1 Family Bucket Cylinder – Stroke	1104 mm	43.5 in

Sound Performance

Performance	ANSI/SAE J1166 APR 90
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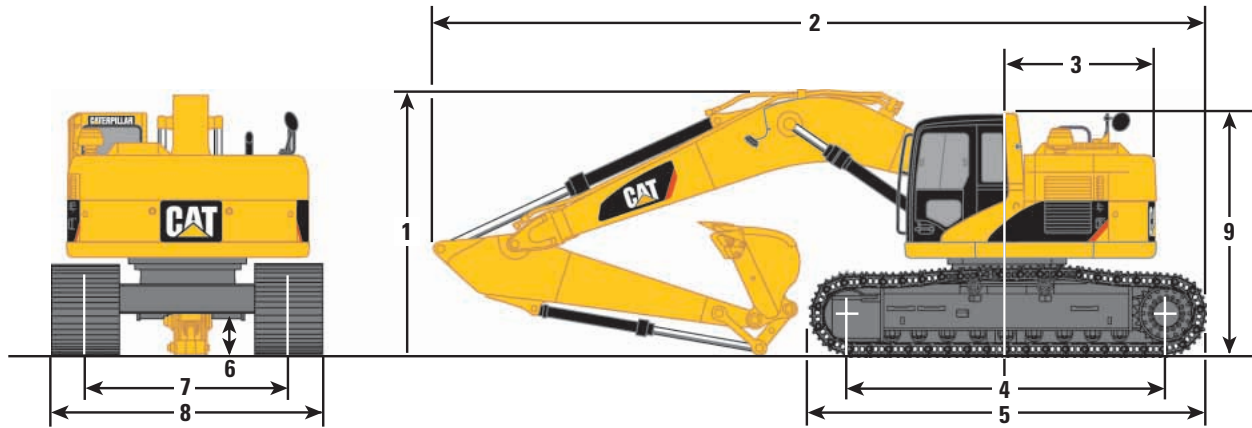
- When properly installed and maintained, the cab offered by Caterpillar, when tested with doors and windows closed according to ANSI/SAE J1166 OCT 98, meets OSHA and MSHA requirements for operator sound exposure limits in effect at time of manufacture.
- Hearing protection may be needed when operating with an open operator station and cab (when not properly maintained or doors/windows open) for extended periods or in noisy environment.

Standards

Brakes	SAE J1026 APR90
Cab/FOGS	SAE J1356 FEB88

Dimensions

All dimensions are approximate.



Boom Options

Reach —
5.68 (18'7") Stick

Reach —
5.68 (18'7") Stick

Stick Options

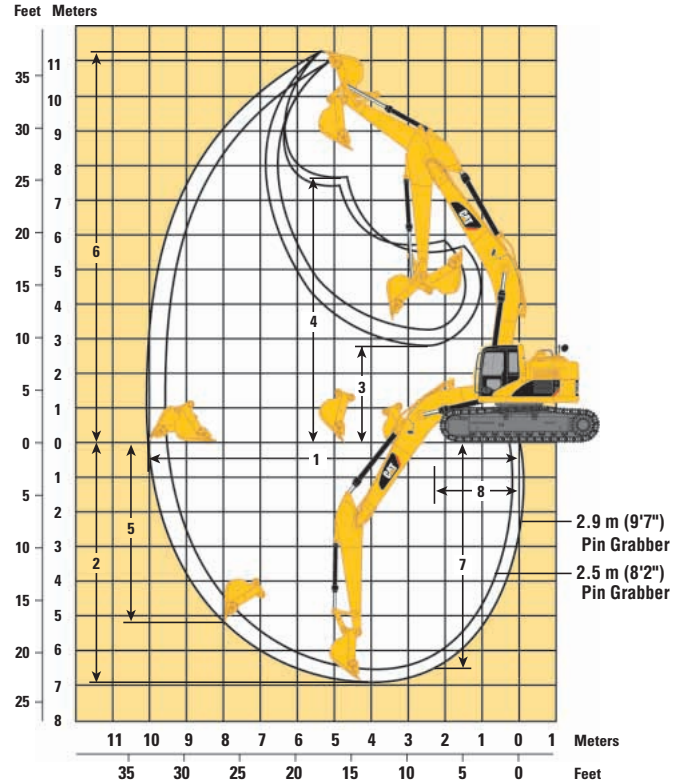
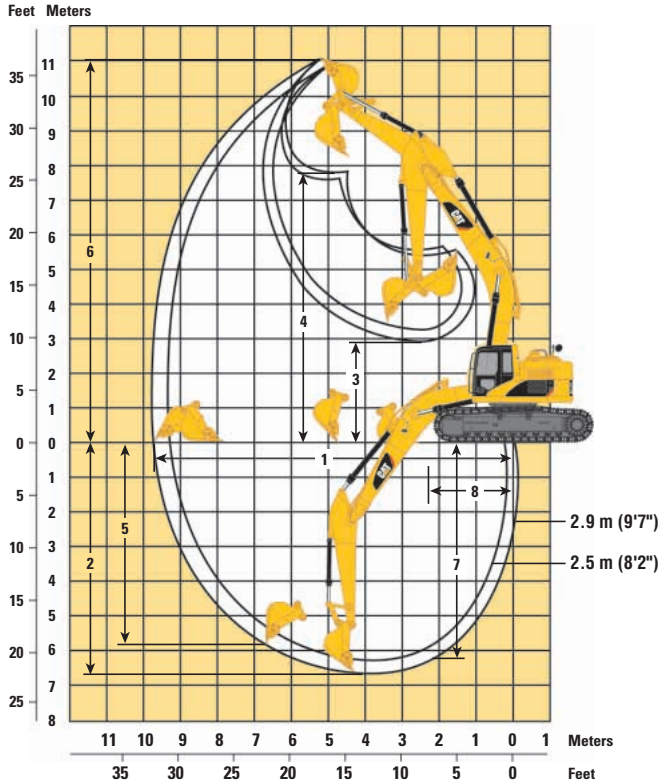
R2.9B1 m (9'7") Std/SA

R2.5B1 m (8'2") Std/SA

Stick Options	R2.9B1 m (9'7") Std/SA	R2.5B1 m (8'2") Std/SA
1 Shipping Height	3030 mm (9'11")	3030 mm (9'11")
2 Shipping Length	8880 mm (29'2")	8880 mm (29'2")
3 Tail Swing Radius	1676 mm (5'6")	1676 mm (5'6")
4 Length to Center of Rollers		
Long	3650 mm (12'0")	3650 mm (12'0")
5 Track Length		
Long	4455 mm (14'7")	4455 mm (14'7")
6 Ground Clearance	450 mm (1'6")	450 mm (1'6")
7 Track Gauge		
Long	2380 mm (7'10")	2380 mm (7'10")
8 Transport Width	800 mm Shoes	600 mm Shoes
Long	3180 mm (10'5")	2980 mm (9'9")
9 Cab Height	2980 mm (9'9")	2980 mm (9'9")

Note: All numbers are approximate

Working Ranges



	Reach 5.68 m (18'7")	Reach 5.68 m (18'7")	Reach 5.68 m (18'7")	Reach 5.68 m (18'7")
Stick Length	R2.9B1 m (9'7")	R2.5B1 m (8'2")	R2.9B1 m (9'7")	R2.5B1 m (8'2")
Bucket	1.0 m³ (1.31 yd³)	1.0 m³ (1.31 yd³)	Pin Grabber Quick Coupler with 1.0 m³ (1.31 yd³)	Pin Grabber Quick Coupler with 1.0 m³ (1.31 yd³)
1 Maximum Reach @ Ground Level	9790 mm (32'1")	9390 mm (30'10")	10 050 mm (33'0")	9650 mm (31'8")
2 Maximum Digging Depth	6710 mm (22'0")	6290 mm (20'8")	6970 mm (22'10")	6550 mm (21'6")
3 Minimum Loading Height	2960 mm (9'9")	3380 mm (11'1")	2710 mm (8'11")	3120 mm (10'3")
4 Maximum Loading Height	7890 mm (25'11")	7600 mm (24'11")	7630 mm (25'0")	7340 mm (24'1")
5 Maximum Vertical Wall Digging Depth	5890 mm (19'4")	5490 mm (18'0")	5200 mm (17'1")	4810 mm (15'9")
6 Maximum Cutting Height	11 010 mm (36'1")	10 720 mm (35'2")	11 260 mm (36'11")	10 970 mm (35'0")
7 Maximum Depth Cut for a 2440 mm (8 ft) Level Bottom	6280 mm (20'7")	5880 mm (19'3")	6560 mm (21'6")	6140 mm (20'2")
8 Minimum Front Swing Radius	2340 mm (7'8")	2280 mm (7'6")	2340 mm (7'8")	2280 mm (7'6")

Bucket and Stick Forces

Bucket and Stick force are calculated with different buckets than those calculated for working range.

General Purpose Buckets	R2.9B1 Stick	R2.9B1 Stick w/Coupler	R2.5B1 Stick	R2.5B1 Stick w/Coupler
Bucket Digging Force (ISO)	140 kN (31,361 lb)	116 kN (26,145 lb)	140 kN (31,361 lb)	116 kN (26,145 lb)
Bucket Digging Force (SAE)	125 kN (28,079 lb)	108 kN (24,189 lb)	125 kN (28,079 lb)	108 kN (24,189 lb)
Stick Digging Force (ISO)	106 kN (23,897 lb)	100 kN (22,436 lb)	118 kN (26,460 lb)	110 kN (24,706 lb)
Stick Digging Force (SAE)	103 kN (23,223 lb)	98 kN (22,009 lb)	114 kN (25,628 lb)	107 kN (24,144 lb)

Power Buckets	R2.9B1 Stick	R2.9B1 Stick w/Coupler	R2.5B1 Stick	R2.5B1 Stick w/Coupler
Bucket Digging Force (ISO)	163 kN (36,711 lb)	124 kN (27,809 lb)	163 kN (36,711 lb)	124 kN (27,809 lb)
Bucket Digging Force (SAE)	144 kN (32,417 lb)	113 kN (25,493 lb)	144 kN (32,417 lb)	113 kN (25,493 lb)
Stick Digging Force (ISO)	109 kN (24,482 lb)	102 kN (22,863 lb)	121 kN (27,202 lb)	112 kN (25,224 lb)
Stick Digging Force (SAE)	106 kN (23,717 lb)	99 kN (22,301 lb)	117 kN (26,235 lb)	109 kN (24,527 lb)

Heavy Duty/Rock Buckets	R2.9B1 Stick	R2.9B1 Stick w/Coupler	R2.5B1 Stick	R2.5B1 Stick w/Coupler
Bucket Digging Force (ISO)	140 kN (31,563 lb)	117 kN (26,258 lb)	140 kN (31,563 lb)	117 kN (26,258 lb)
Bucket Digging Force (SAE)	125 kN (28,079 lb)	107 kN (24,144 lb)	125 kN (28,079 lb)	108 kN (24,212 lb)
Stick Digging Force (ISO)	106 kN (23,920 lb)	100 kN (22,458 lb)	118 kN (26,505 lb)	110 kN (24,729 lb)
Stick Digging Force (SAE)	103 kN (23,200 lb)	98 kN (21,964 lb)	114 kN (25,606 lb)	107 kN (24,100 lb)

Major Component Weights

Base machine with counterweight and shoes (without front linkage)		
Long undercarriage with 800 mm shoes	20 200 kg	44,533 lb
Two boom cylinders	344 kg	758 lb
Counterweight	6100 kg	13,448 lb
Boom (includes lines, pins and stick cylinder)		
Reach boom 5.7 m (18'5")	1660 kg	3,660 lb
Stick (includes lines, pins, bucket cylinder and linkage)		
R2.9B1 (9'7")	970 kg	2,138 lb
R2.5B1 (8'3")	940 kg	2,072 lb
Undercarriage [includes carbody, swing bearing, trackframe, rollers, idlers, steps, guards, final drive]		
L undercarriage with 800 mm shoes	7850 kg	17,306 lb

All weights are approximate.

321D LCR Bucket Options

	Adapter	Capacity*		Width		Tip Radius		Weight (without tips)		Teeth Qty	R2.9B1		R2.5B1	
		m ³	yd ³	mm	in	mm	in	kg	lb		R2.9B1 w/QC	R2.5B1 w/QC		
B Family														
General Purpose (GP)	K80	0.55	0.72	610	24	1565	61.6	629	1,387	3	●	●	●	●
	K80	0.75	0.98	762	30	1565	61.6	718	1,583	4	●	●	●	●
	K80	0.95	1.24	914	36	1565	61.6	790	1,742	5	●	●	●	●
	K80	1.17	1.53	1067	42	1565	61.6	852	1,878	5	◐	◐	●	◐
	K80	1.39	1.82	1219	48	1565	61.6	926	2,041	6	○	○	◐	○
	K80	1.57	2.05	1372	54	1565	61.6	1000	2,205	6	◐	◐	○	◐
Heavy Duty (HD)	K90	0.47	0.61	610	24	1578	62.1	650	1,433	3	●	●	●	●
	K90	0.64	0.84	762	30	1578	62.1	743	1,638	4	●	●	●	●
	K90	0.82	1.07	914	36	1578	62.1	813	1,792	5	●	●	●	●
	K90	1.00	1.31	1067	42	1578	62.1	866	1,909	5	●	●	●	●
	K90	1.19	1.56	1219	48	1578	62.1	956	2,108	6	◐	○	●	◐
	K90	1.38	1.80	1372	54	1578	62.1	1030	2,271	6	○	◐	◐	○
Heavy Duty Rock (HDR)	K90	0.54	0.70	610	24	1578	62.1	696	1,534	3	●	●	●	●
	K90	0.77	1.00	762	30	1578	62.1	781	1,722	4	●	●	●	●
	K90	0.84	1.10	914	36	1578	62.1	863	1,903	5	●	●	●	●
Heavy Duty Power (HDP)	K90	0.79	1.03	914	36	1458	57.4	811	1,788	5	●	●	●	●
	K90	0.96	1.26	1067	42	1458	57.4	875	1,929	5	●	●	●	●
	K90	1.14	1.49	1219	48	1458	57.4	954	2,103	6	◐	◐	●	◐
Ditch Cleaning (DC)	n/a	1.02	1.33	1524	60	1139	44.8	726	1,601	0	●	●	●	●
	n/a	1.24	1.62	1830	72	1139	44.8	823	1,814	0	◐	◐	●	◐

Assumptions for maximum material density rating:

1. Front Linkage fully extended at ground line
2. Machine positioned 90 degrees over the side
3. Bucket curled
4. 100% Bucket Fill Factor

Please consult with your Caterpillar dealer personnel for optimum selection of buckets and work tools that best match your application.

* Based on SAE J296, some calculations of capacity specs fall on borderlines. Rounding may allow two buckets to have the same English rating, but different metric ratings.

- 2100 kg/m³ (3,500 lb/yd³) max material density
- ◐ 1800 kg/m³ (3,000 lb/yd³) max material density
- 1500 kg/m³ (2,500 lb/yd³) max material density
- ◑ 1200 kg/m³ (2,000 lb/yd³) max material density

321D LCR Work Tool Matching Guide

Boom Options	Reach Boom 5.7 m (18'5")	
Stick Options	R2.9B1 (9'7")	R2.5B1 (8'2")
Hydraulic Hammer	H115s/ H120Cs/ H130s	H115s/ H120Cs/ H130s
Vibratory Plate Compactor	CVP110	CVP110
Multi-Processor	MP15	MP15
360 Scrap Shear	S320	S320
Trash Grapple	2.7 m ³ (3.5 yd ³)	2.7 m ³ (3.5 yd ³)
Contractor's Grapple	yes	yes
Hydraulic Thumb	yes	yes
Dedicated Quick Coupler	yes	yes
Pin-Grabber Quick Coupler	yes	yes

Reach Boom Lift Capacities



Load Point Height



Load Radius Over Front



Load Radius Over Side



Load at Maximum Reach

STICK – 2.9 m (9'7")
BUCKET – 0.82 m³ (1.07 yd³)

UNDERCARRIAGE – Long
SHOES – 800 mm (32") triple grouser

BOOM – 5.7 m (18'9")
HEAVY LIFT – On

	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft	
9.0 m 30.0 ft	kg lb											*2250 *5,050	*2250 *5,050	6.43 20.44
7.5 m 25.0 ft	kg lb						*4350 *8,900	*4350 *8,900				*2000 *4,400	*2000 *4,400	7.94 25.74
6.0 m 20.0 ft	kg lb				*5150 *11,150	*5150 *11,150	*5000 *10,950	4800 10,300	*3750 *7,300	3150 6,750		*1900 *4,150	*1900 *4,150	8.86 28.91
4.5 m 15.0 ft	kg lb		*7750	*7750	*6550 *14,100	*6550 *14,100	*5700 *12,300	4650 9,950	*5200 *11,000	3100 6,600		*1900 *4,150	*1900 *4,150	9.39 30.74
3.0 m 10.0 ft	kg lb		*13 650 *29,100	*13 650 *29,100	*8600 *18,450	7050 15,150	*6650 *14,350	4400 9,450	5200 11,100	3000 6,400		*2000 *4,350	1900 4,100	9.61 31.52
1.5 m 5.0 ft	kg lb		*5350 *12,750	*5350 *12,750	*10 450 *22,500	6500 13,950	7300 15,650	4150 8,900	5050 10,850	2850 6,150		*2150 *4,700	1850 4,050	9.55 31.34
Ground Line	kg lb		*6950 *15,900	*6950 *15,900	*11 400 24,550	6150 13,200	7100 15,200	3950 8,500	4950 10,600	2800 5,950		*2450 *5,300	1950 4,300	9.21 30.20
-1.5 m -5.0 ft	kg lb	*6400 *14,300	*6400 *14,300	*10 700 *24,250	*10 700 *24,250	11 350 24,250	6050 12,950	7000 14,950	3850 8,300	4900 10,550		*2900 *6,350	2250 4,900	8.54 27.97
-3.0 m -10.0 ft	kg lb	*10 550 *23,700	*10 550 *23,700	*15 150 *32,750	12 200 26,100	*10 550 *22,800	6100 13,050	7000 15,050	3900 8,350			*3750 *8,300	2850 6,350	7.45 24.31
-4.5 m -15.0 ft	kg lb			*11 850 *25,350	*11 850 *25,350	*8400 *17,850	6300 13,550					*3600 *8,750	*3600 *8,750	5.70 18.47

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.



Load Point Height



Load Radius Over Front



Load Radius Over Side



Load at Maximum Reach – Coupler Curled

STICK – 2.9 m (9'7")
BUCKET – No Bucket, Bare Quick Coupler

UNDERCARRIAGE – Long
SHOES – 800 mm (32") triple grouser

BOOM – 5.7 m (18'9")
HEAVY LIFT – On

	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft	
9.0 m 30.0 ft	kg lb				*5050 *10,150	*5050 *10,150						*3750 *8,400	*3750 *8,400	6.43 20.44
7.5 m 25.0 ft	kg lb						*4900 *10,150	*4900 *10,150				*3200 *7,050	*3200 *7,050	7.94 25.74
6.0 m 20.0 ft	kg lb				*5500 *11,950	*5500 *11,950	*5400 *11,850	5150 11,000	*3900 *7,150	3500 *7,150		*3000 *6,550	*3000 *6,550	8.86 28.91
4.5 m 15.0 ft	kg lb		*7850	*7850	*6900 *14,900	*6900 *14,900	*6050 *13,200	4950 10,650	*5600 *11,700	3450 7,350		*2950 *6,500	*2950 *6,500	9.39 30.74
3.0 m 10.0 ft	kg lb		*14 050 *29,900	*14 050 *29,900	*8950 *19,250	7350 15,750	*7050 *15,200	4700 10,150	5500 11,850	3350 7,150		*3050 *6,650	1900 4,100	9.61 31.52
1.5 m 5.0 ft	kg lb		*5850 *13,850	*5850 *13,850	*10 850 *23,350	6800 14,650	7600 16,350	4500 9,600	5400 11,550	3200 6,900		*3250 *7,150	1850 4,050	9.55 31.34
Ground Line	kg lb		*7400 *16,900	*7400 *16,900	11 800 25,300	6500 13,950	7400 15,900	4300 9,250	5300 11,350	3100 6,700		*3650 *8,000	1950 4,300	9.21 30.20
-1.5 m -5.0 ft	kg lb	*6800 *15,150	*6800 *15,150	*11 150 *25,300	*11 150 *25,300	11 650 25,000	6400 13,750	7300 15,700	4200 9,050	5250 11,250		*4300 *9,500	2250 4,900	8.54 27.97
-3.0 m -10.0 ft	kg lb	*11 000 *24,650	*11 000 *24,650	*15 600 *33,800	12 600 26,950	*11 000 *23,700	6450 13,800	7300 15,750	4250 9,100			*5600 *12,450	2850 6,350	7.45 24.31
-4.5 m -15.0 ft	kg lb			*12 300 *26,250	*12 300 *26,250	*8800 *18,750	6600 14,250					*6200 *13,650	*6200 *13,650	5.70 18.47

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

Always refer to the appropriate Operation and Maintenance Manual for specific product information.

Reach Boom Lift Capacities



Load Point Height



Load Radius Over Front



Load Radius Over Side



Load at Maximum Reach

STICK – 2.5 m (8'3")
BUCKET – 0.82 m³ (1.07 yd³)

UNDERCARRIAGE – Long
SHOES – 800 mm (32") triple grouser

BOOM – 5.7 m (18'9")
HEAVY LIFT – On

	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft	
9.0 m 30.0 ft	kg lb											*2700 *6,100	*2700 *6,100	5.75 18.13
7.5 m 25.0 ft	kg lb				*5100 *10,700	*5100 *10,700	*3800 *7,650	*3800 *7,650				*2350 *5,250	*2350 *5,250	7.44 24.08
6.0 m 20.0 ft	kg lb				*5800 *12,550	*5800 *12,550	*5450 *11,950	4750 10,100				*2250 *4,950	*2250 *4,950	8.42 27.48
4.5 m 15.0 ft	kg lb		*9750 *20,650	*9750 *20,650	*7200 *15,500	*7200 *15,500	*6100 *13,200	4600 9,850	5250 *10,550	3050 6,500		*2250 *4,950	2200 4,850	8.98 29.42
3.0 m 10.0 ft	kg lb				*9200 *19,750	6900 14,850	*7000 *15,100	4350 9,350	5150 11,050	2950 6,300		*2350 *5,200	2050 4,450	9.22 30.23
1.5 m 5.0 ft	kg lb				*10 850 *23,350	6350 13,700	7250 15,550	4100 8,800	5050 10,800	2850 6,100		*2550 *5,600	2000 4,400	9.16 30.05
Ground Line	kg lb		*6450 *14,800	*6450 *14,800	11 400 24,400	6100 13,100	7050 15,150	3950 8,450	4950 10,600	2800 5,950		*2900 *6,350	2150 4,650	8.79 28.85
-1.5 m -5.0 ft	kg lb	*7050 *15,750	*7050 *15,750	*11 400 *25,850	*11 400 *25,850	*11 300 24,250	6050 12,950	7000 15,000	3900 8,350	4950 2750		*3450 *7,600	2450 5,450	8.09 26.48
-3.0 m -10.0 ft	kg lb	*12 100 *27,100	*12 100 *27,100	*14 150 *30,600	12 300 *26,300	*10 100 *21,800	6150 13,200	7050 15,150	3950 8,500			*4500 *9,850	3300 7,300	6.91 22.53
-4.5 m -15.0 ft	kg lb			*10 400 *22,100	*10 400 *22,100	*7400 *15,550	6450 13,850					*5900 *12,900	5100 11,600	5.24 16.88

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.



Load Point Height



Load Radius Over Front



Load Radius Over Side



Load at Maximum Reach – Coupler Curled

STICK – 2.5 m (8'3")
BUCKET – No Bucket, Bare Quick Coupler

UNDERCARRIAGE – Long
SHOES – 800 mm (32") triple grouser

BOOM – 5.7 m (18'9")
HEAVY LIFT – On

	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft	
9.0 m 30.0 ft	kg lb											*4600 *10,400	*4600 *10,400	4.37 13.51
7.5 m 25.0 ft	kg lb				*5650 *12,500	*5650 *12,500	*4650 *4650					*3800 *8,450	*3800 *8,450	6.19 19.95
6.0 m 20.0 ft	kg lb				*6150 *13,350	*6150 *13,350	*5850 *12,850	5050 10,850				*3550 *7,800	*3550 *7,800	7.28 23.70
4.5 m 15.0 ft	kg lb		*10 050 *21,350	*10 050 *21,350	*7550 *16,300	*7550 *16,300	*6450 *14,050	4900 10,550	5600 *11,250	3400 7,250		*3500 *7,700	3050 6,800	7.94 25.97
3.0 m 10.0 ft	kg lb				*9550 *20,550	7200 15,500	*7400 *15,950	4650 10,050	5500 11,750	3300 7,050		*3650 *7,950	2800 6,150	8.28 27.13
1.5 m 5.0 ft	kg lb				*11 250 *24,250	6700 14,450	7550 16,250	4450 9,550	5350 11,500	3200 6,850		*3900 *8,550	2700 5,950	8.33 27.34
Ground Line	kg lb		*6850 *15,700	*6850 *15,700	11 750 25,150	6450 13,900	7400 15,850	4300 9,200	5300 11,350	3100 6,700		*4400 *9,650	2800 6,100	8.11 26.61
-1.5 m -5.0 ft	kg lb	*7350 *16,450	*7350 *16,450	*11 850 *26,850	*11 850 *26,850	11 650 25,000	6400 13,750	7300 15,700	4200 9,050	5250 3100		5200 11,400	3050 6,700	7.59 24.86
-3.0 m -10.0 ft	kg lb	*12 500 *28,000	*12 500 *28,000	*14 600 *31,600	12 700 *27,150	*10 550 *22,700	6500 13,900	7350 15,850	4250 9,200			6300 13,950	3700 8,200	6.70 21.85
-4.5 m -15.0 ft	kg lb			*10 800 *23,000	*10 800 *23,000	*7800 *16,400	6750 14,500					*6300 *13,750	5400 12,250	5.24 16.89

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

Always refer to the appropriate Operation and Maintenance Manual for specific product information.

Standard Equipment

Standard equipment may vary. Consult your Caterpillar® dealer for details.

Electrical

- 50 Ampere alternator
- Base machine light (frame)
- Horn
- Pre-start monitoring system – checks for low fluids (engine oil, coolant, hydraulic oil) prior to starting machine

Operator Environment (Mandatory Attachment)

- Air conditioner, heater, defroster with automatic climate control
- AM/FM Radio with antenna and 2 speakers
- Ashtray with 24 volt lighter
- Beverage/cup holder
- Bolt-on Falling object Guarding System (FOGS) capability
- Cab Glass
 - Openable and retractable two-piece front windshield
 - Sky-light, pop-up, polycarbonate
- Coat hook
- Floor mat
- Instrument panel and gauges
- Joysticks, console mounted, pilot operated
- Light, interior
- Literature compartment
- Monitor, full graphic color display
- Neutral lever (lock out) for all controls
- Polycarbonate side windows
- Positive filtered ventilation
- Pressurized cab
- Seat, suspension, with high back and head rest
- Seat belt, retractable – 76 mm (3 in)
- Storage compartment suitable for lunch box cooler
- Sun shade (for skylight)
- Travel control pedals with removable hand levers
- Windows, Polycarbonate (mandatory attachment)
- Windshield wiper and washer (upper and lower)

Engine/Power Train

- C6.4 with ACERT™ Technology
 - Air intake heater
 - Air-to-air aftercooler (ATAAC)
 - 24 volt electric start
 - HEUI™ injectors
 - 2300 m (7,500 ft) altitude capability without derate
- Automatic engine speed control with one touch low idle
- Cooling
 - Protection of 43° C (110° F) to –18° C (0° F) at 50% concentration
- Priming pump
- Straight line travel
- Two-speed auto-shift travel
- Water separator in fuel line

Undercarriage

- Grease lubricated track
- Hydraulic track adjusters
- Idler and center section track guards
- Long undercarriage

Other Standard Equipment

- Automatic swing parking brake
- Auxiliary hydraulic valve
- Capability of stackable valves (max of 3) for main valve
- Capability of auxiliary circuit
- Counterweight with lifting eyes
- Door locks, cap locks and Caterpillar® one key security system
- Fine swing control
- Fully pressurized hydraulic system
- Heavy lift
- Mirrors (frame-right, cab left)
- S•O•SSM quick sampling valves for engine and hydraulic oil
- Wave fin radiator
- Wiring provision for Product Link

Optional Equipment

Optional equipment may vary. Consult your Caterpillar dealer for details.

Front Linkage

Booms

Reach 5.68 m (18 ft 7 in)

Sticks

Reach 2.9 m (9 ft 7 in)

Reach 2.5 m (8 ft 2 in)

Bucket Linkage

B1 Family

Boom Lowering Control Device

Electrical

Light, Boom – Right side

Lights, Cab mounted (2)

Machine Security System (MSS)

Power supply (12V-5 AMP)

Product Link (PL121SR/PL321SR)

Travel Alarm (Mandatory attachment)

Guarding

Falling Object Guarding System (FOGS)

Front windshield guard

Full length, wire mesh

Heavy-duty bottom guards

Track guiding guards

Sprocket end, idler end guard

Two-piece full length (center guard removed)

Vandalism guards

Operator Environment

Hand control pattern changer (ISO-SAE)

Rear window, secondary exit

Seat, high back with air suspension and heater

Engine/Power Train

Starting, Cold weather package

Two additional maintenance free batteries

High capacity starter motor

Heavy-duty cable

Jump-start receptacle

Water level indicator (Fuel)

Undercarriage

Track shoes

600 mm (24 in) triple grouser

700 mm (28 in) triple grouser

800 mm (32 in) triple grouser

Heavy-duty rollers

Auxiliary Hydraulics

Hammer Circuit

For single function (1 way/2 pump) hydraulic tools

Hydraulic pin grabber quick coupler and controller

Lines for booms and sticks

Thumb Circuit

For double function (2 way/1 pump) hydraulic tools

Tool Control System

Capability of adding medium pressure

For single or double function, (1 or 2 way, 1 or 2 pump)

hydraulic tools

Hydraulic Pin Grabber Quick Coupler and controller

Joysticks with additional switches

Lines for booms and sticks

Medium pressure circuit (added to Tool Control only)

for tools requiring medium pressure

Program up to 10 tools in memory

Work Tools

Wide offering of buckets, tips and sidecutters

321D LCR Hydraulic Excavator

AEHQ5873-01 (4-08)

Replaces AEHQ5873

NACD

For more complete information on Cat products, dealer services,
and industry solutions, visit us on the web at www.cat.com

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