R1600G

Underground Mining Loader

Engine		
Engine Model	Cat® 3176C EUI ATAAC	
Gross Power – SAE J1995	185/200 kW	248/268 hp
Operating Specifications		
Nominal Payload Capacity	10 200 kg	22,487 lb
Gross Machine Operating Weight	29 800 kg	65,698 lb
Bucket Capacities		
Bucket Capacity – Std.	4.8 m^3	6.3 yd^3

R1600G Underground Mining Loader

Engineered for performance. Designed for comfort. Built to last.

Power Train – Engine

The Cat® 3176C EUI ATAAC diesel engine delivers the power and reliability necessary to perform in the most demanding underground mining applications. Designed for efficient operation, excellent fuel efficiency, lower emissions, reduced engine noise and lower operating costs. **pg. 4**

Power Train – Transmission

The Cat four-speed planetary power shift transmission features heavy duty components to handle the toughest jobs. Electronic controls allow smooth shifting for greater productivity, durability and longer component life. **pg. 5**

Hydraulics

Powerful Cat hydraulics deliver excellent digging and lifting forces to move materials quickly. High volume pumps and large cylinders provide quick, powerful response and fast cycle times. Pilot operated joysticks provide low effort operation and smooth control. **pg. 6**

Serviceability

The R1600G is designed for quick and easy servicing. Simplified service and maintenance features reduce downtime, allowing the machine to spend less time being serviced and more time being productive. **pg. 11**

Customer Support

Caterpillar® dealers provide unmatched product support, anywhere in the world. With industry-best parts availability and a wide range of maintenance and service options, Cat dealers have what it takes to keep your loader working in the mines. **pg. 12**

Performance and Agility.
Compact design, high engine power, higher torque rise, stronger components and excellent maneuverability ensures the R1600G is a solid and agile performer.

Unmatched operator comfort.
World class operator station fitted with revolutionary electronics and hydraulic controls for low effort operation and increased productivity.

Structures

Structural components are the backbone of the R1600G's durability. The heavy duty loader frame is designed and built to absorb twisting, impact and high loading forces for maximum durability and reliability. Z-bar linkage generates powerful breakout forces and optimum loading angle. **pg. 7**

Operator Station

The ergonomic cab is designed for operator comfort and ease of operation to allow the operator to focus on production. Controls and gauges are positioned within easy reach for optimum efficiency and superior control all shift long. **pg. 8**

Buckets

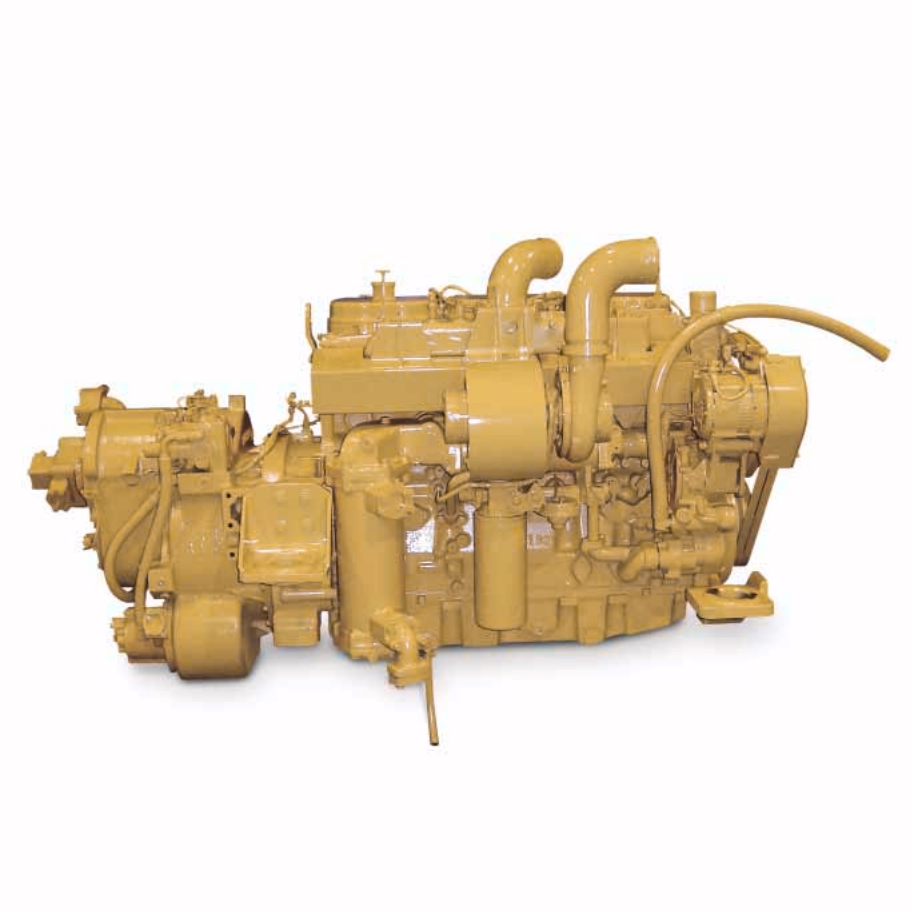
Cat underground loader buckets are designed for optimal loadability and structural durability in tough mining conditions. A range of sizes and configurations are available to match material conditions and maximize productivity. **pg. 10**

Safety

Caterpillar® sets the standard when it comes to safety in the design and manufacturing of heavy equipment for the mining industry. Safety is not an after thought at Caterpillar, but an integral part of all machine and systems designs. **pg. 13**

Power Train – Engine

The Cat® 3176C diesel engine delivers the power and reliability necessary to perform in the most demanding underground mining applications.



Turbocharged and Aftercooled. Air-to-air aftercooling provides improved fuel economy by packing cooler, denser air into cylinders for more complete combustion of fuel and lower emissions.

Electronic Unit Injection. The electronically controlled unit injection fuel system senses operating conditions and regulates fuel delivery for optimum fuel efficiency. The proven high-pressure fuel system provides improved response times and more efficient fuel burn with lower emissions and less smoke.

Pistons. Oil cooled pistons increase heat dissipation and promote longer piston life.

Radiator. Modular radiator with swing-out grill provides easy access for cleaning or repair. Built in sight gauge allows for quick, safe coolant level checks.

Engine. The six cylinder, four-stroke, turbocharged Cat 3176C EUI ATAAC diesel engine is precisely engineered and stringently tested to maintain a tradition of quality. It does it all with profit-boosting performance, heavy duty durability and reliability, built-in serviceability, excellent fuel economy and low emission levels.

High Torque Rise. Provides unequalled lugging force while digging, tramming and traversing steep grades. Torque rise effectively matches transmission shift points for maximum efficiency and fast cycle times.

Power Train – Transmission

Designed for durability, the Cat power shift transmission delivers smooth, responsive performance and reliability in tough conditions.

Power Shift Transmission.
The Cat four-speed planetary power shift transmission is matched with the 3176C diesel engine to deliver constant power over a wide range of operating speeds.

Robust Design. Designed for rugged underground mining conditions, the proven planetary power shift transmission is built for long life between overhauls.

Electronic Controls.

- Electronic controls allow smooth, on-the-go shifting for greater productivity.
- Hydraulic modulation cushions the shift and reduces stress on components.
- Pump drive and output transfer use high contact gear ratios to reduce sound levels.
- Perimeter mounted, large diameter clutch packs control inertia for smooth shifting and increased component life.

Torque Converter. High capacity torque converter delivers more power to the wheels for superior power train efficiency.

Electronic Autoshift Transmission.
The electronic auto shift transmission increases operator efficiencies and optimizes machine performance. The operator can choose between manual or auto shift modes.

Transmission Neutralizer. Using the left brake pedal, the operator can engage the service brakes and neutralize the transmission, maintaining high engine rpm for full hydraulic flow, enhancing digging and loading functions.

Final Drives. Cat final drives work as a system with the planetary power shift transmission to deliver maximum power to the ground. Built to withstand the forces of high torque and impact loads, double reduction final drives provide high torque multiplication to further reduce drive train stress.

Axles. Heavy duty axles are built rugged for long-life in the most demanding environments.

Oscillating Rear Axle. Oscillating rear axle ensures four-wheel ground contact for maximum traction and stability at all times.

Differential. No spin rear differential reduces tire wear and maximizes traction in uneven terrain.

Brakes. Fully enclosed oil immersed disc brakes incorporate independent service and parking brake pistons. Hydraulic actuated independent circuits provide improved performance and reliability.

Electronic Technician. ET service tool provides service technicians with easy access to stored diagnostic data through Cat Data Link to simplify problem diagnosis and increase availability.

Electronically Controlled Torque Converter Lockup Clutch.
Combines maximum rimpull whilst in torque converter drive, with the efficiency and performance of direct drive when lock up is engaged.

Hydraulics

Cat hydraulics deliver the power and control to keep material moving.

Pilot Controls. Low effort, pilot operated joystick implement control with simultaneous lift and tilt functions optimizes operating efficiency. Optional circuit controls enable ejector bucket to be controlled from switch on joystick.

Steering System. STIC™ control system integrates steering and transmission functions into a single controller for maximum responsiveness and smooth control.

Optional Ride Control. Automatic Ride Control enhances machine ride and performance at speeds above 5 km/h (3 mph).

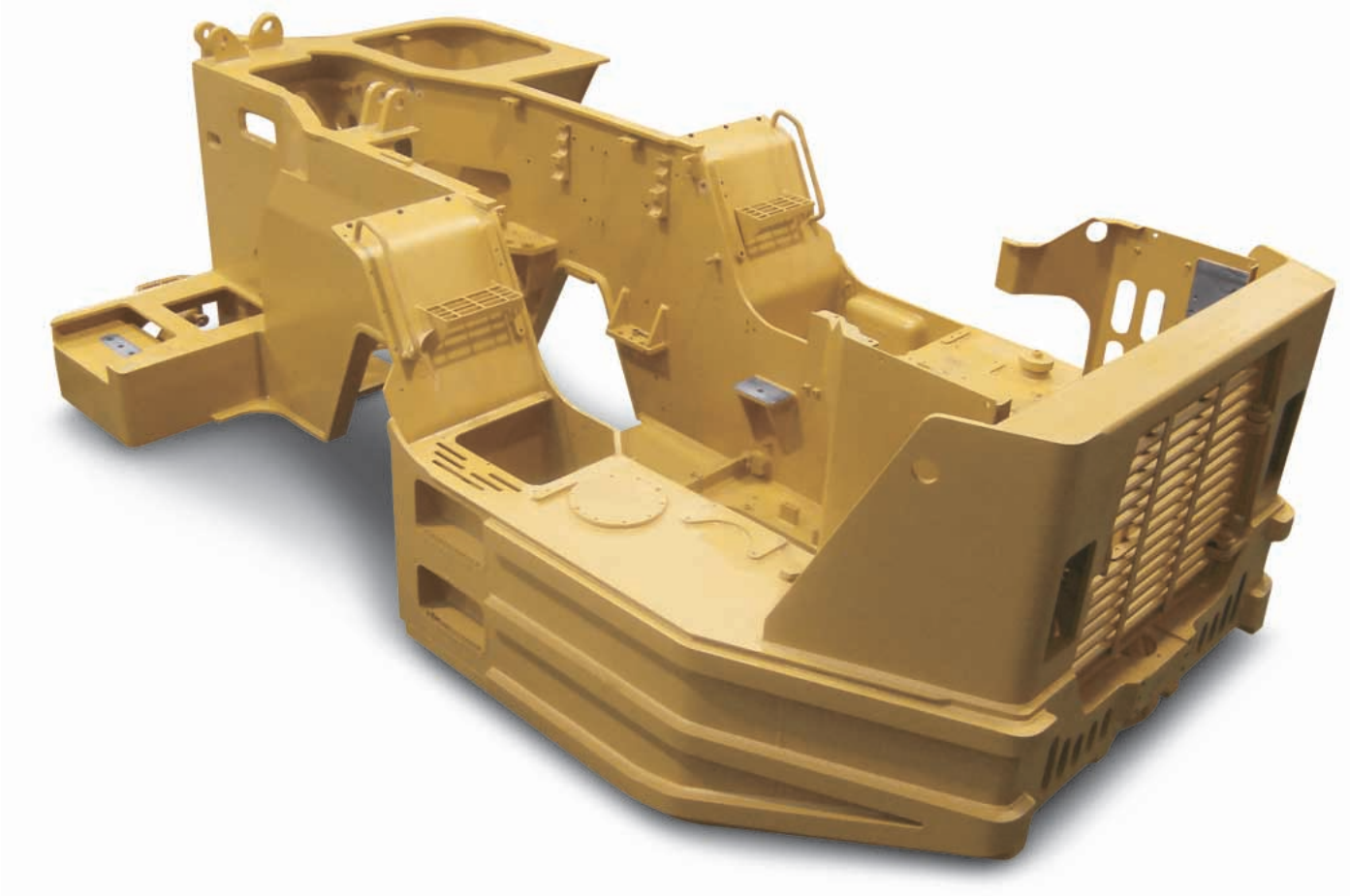
Cat Hydraulic Hose. Field proven Cat high pressure XT™ hydraulic hose is exceptionally strong and flexible for maximum system reliability and long life in the most demanding conditions. Reusable couplings with O-ring face seals provide superior, leak free performance and prolong hose assembly life.

Hydraulic System. Powerful Cat hydraulics deliver exceptional digging and lifting forces and fast cycle times.

Lift and Tilt System. High hydraulic flow rates provide fast hydraulic cylinder response and powerful lift forces. Large-bore tilt and lift cylinders deliver exceptional strength, performance and durability.

Structures

Designed for maximum strength and durability in the harshest operating environments.



Frame Design. The frame features robust structural components for outstanding durability in the toughest loading conditions. Caterpillar integrates advanced processes in the design and manufacture of Cat frames and structures. Computer modeling and Finite Element Analysis (FEA) are used extensively throughout design.

Steel Frame. Strong steel frame structures are designed to resist twisting forces, torsional shock and stresses generated during the loading cycle, while protecting drive line and hydraulic system components.

Lift Arms. Solid steel lift arms absorb high stresses generated during loading without sacrificing strength or durability. The linkage design offers excellent reach and dump clearance for better productivity. Lift arm support pins prevent lowering the lift arms during service and maintenance.

Loader Tower. The four plate loader tower provides a solid mount for lift arms, lift cylinders and Z-bar tilt linkage. The loader frame is designed and built to absorb twisting, impact and high loading forces.

Cast-Steel Cross Tube. The cast steel cross tube provides excellent resistance to torsion and impact loads, keeping pin bores well aligned and extending component service life.

Sealed Pins. Sealed colleted pins are fitted to all bucket and lift arm hinge points for longer pin and bushing life. This reduces maintenance costs and extends service intervals. The sealed joints retain lubrication and prevent contaminant entry.

Hitch. Spread hitch design widens the distance between upper and lower hitch plates to distribute forces and increase bearing life. Thicker hitch plates reduce deflection. The wide opening provides easy service access. Upper and lower hitch pins pivot on roller bearings to distribute horizontal and vertical loads over a greater surface area. Shim adjusted preload reduces maintenance time. An on-board steering frame lock pin is fitted to prevent articulation during maintenance and service.

Operator Station

Setting a new industry standard for comfort and efficiency.

Ergonomic Layout. The R1600G operator station is ergonomically designed for total machine control in a comfortable, productive and safe environment. All controls, levers switches and gauges are positioned to maximize productivity and minimize operator error.

Pilot Controls. Low-effort pilot operated joystick controls integrate steering, transmission and implement functions for smoother, faster cycles with less operator fatigue.

Electronic Autoshift. Electronic autoshift allows the operator to choose automatic or manual shifting. In auto mode, the operator uses a dash mounted switch to select the highest gear they wish the machine to shift to. In this mode, the transmission shifts at factory preset shift points so that each shift occurs at optimum torque and ground speed for maximum machine performance.

Dual-Pedal Braking. The left pedal functions as a brake and a transmission neutralizer so the operator can maintain high engine rpm for full hydraulic flow and fast cycle times.

Protective Structure. The operator station has integrated into its construction a ROPS – Roll-over protective structures and FOPS – Falling object protective structures. This structure is resiliently mounted to the frame, reducing vibration to the operator for a more comfortable ride.

Optional Enclosed Cab. Optional sound-suppressed ROPS cab provides a quiet, secure working environment. Large window openings offer excellent visibility in all directions. Enclosed design provides fresh, pressurized, temperature-controlled air circulation with air-conditioned comfort and a more comfortable working environment. The system uses environmentally friendly R134a refrigerant.

Optional Ride Control. The system uses a nitrogen filled oil accumulator in the hydraulic lift circuit to act as a shock absorber for the bucket and lift arms. The lift arm and bucket response to movement is dampened over rough ground, reducing fore and aft pitch, improving cycle times and load retention. A smoother, more comfortable ride gives operators the confidence to travel at higher speeds during load and carry applications.

Suspension Seat. Suspension seat provides optimal driving position and enhances operator comfort, all shift long.

STIC™ Steering Control. STIC™ combines directional selection, gear selection and steering into a single lever for maximum responsiveness. Simple side-to-side motion turns machine right or left. Transmission shifting (forward/neutral/reverse) is controlled using a three position rocker switch. The thumb operated upshift and downshift buttons control manual shifting.

Monitoring System. Caterpillar® Monitoring System continuously provides critical machine data to keep the machine performing at top production levels. A warning system alerts the operator of immediate or impending problems with engine oil pressure, parking brake engagement, brake oil pressure, electrical system, low fuel, hydraulic oil temperature, coolant level/temperature, transmission oil temperature and impending brake application (optional).

• **Digital Display.** "Normal" mode displays choice of hour meter, odometer or digital tachometer. "Service" mode displays operating parameters, diagnostic codes and out-of-range gauge readings.

• **Gauge Cluster.** Maintains a constant display of vital machine functions, including: engine coolant temperature, transmission oil temperature, hydraulic oil temperature, and fuel level.

• **Tachometer/Speedometer Module.** Displays engine speed, ground speed, gear indicator, and machine direction.

Buckets

Cat buckets provide the flexibility to match the machine to the material and conditions.

Bucket Capacities. Buckets are available in a range of sizes and capacities to suit most material types and densities.

Optional Wear Packages. Weld-on wear plates in high wear areas are standard. Additional wear packages, including sacrificial wear strips and Cat heal shrouds protect the edges from damage and reduce the need for costly bucket rebuilds.

Optional Cutting Edges. Cat half arrow and cast half arrow cutting edges extend bucket life in high wear applications.

Buckets. Aggressive Cat bucket designs deliver unmatched productivity in the most demanding applications. Underground mining buckets are designed for optimal loadability and structural reliability to help lower your cost-per-ton.

Bucket Selection. Cat underground loader buckets are available in two styles to meet a range of loading, hauling and dumping conditions.

- Dump buckets
- Ejector buckets

Serviceability

Less time spent on maintenance means more time being productive.

Service Access. Easy access to daily service points simplifies servicing and reduces time spent on regular maintenance procedures.

Ground-Level Access. Allows convenient servicing to all tanks, filters, lubrication points and compartment drains.

Air Filters. Radial seal air filters are easy to change, reducing time required for air filter maintenance.

Sight Gauges. Fluid level checks are made easier with sight gauges.

Diagnostics. Electronic Technician (ET) Service Tool enables quick electronic diagnosis of machine performance and key diagnostic data for effective maintenance and repairs.

Sealed Electrical Connectors. Electrical connectors are sealed to lock out dust and moisture.

Scheduled Oil Sampling. S•O•S℠ sampling valves speed sampling and analysis reliability.

Customer Support

Caterpillar® dealers have what it takes to keep your underground mining loader productive.

Machine Selection. Make detailed comparisons of the machines under consideration before purchase. Cat dealers can estimate component life, preventive maintenance cost, and the true cost of lost production.

Purchase. Look past initial price. Consider the financing options available, as well as day-to-day operating costs. This is also the time to look at dealer services that can be included in the cost of the machine to lower equipment owning and operating costs over the long run.

Financing. Your dealer is an expert at arranging affordable financing options for all Caterpillar products.

Product Support. You will find nearly all parts at your dealer parts counter. Cat dealers use a worldwide computer network to locate in-stock parts to minimize machine downtime. Save money with Cat Reman parts. Receive the same warranty and reliability as new products at savings of 40 to 70 percent.

Literature Support. Operation and maintenance manuals are easy to use, helping you get the full value of your equipment investment.

Customer Service Agreements. Cat dealers offer a variety of product support agreements, and work with customers to develop a plan that meets specific needs. Plans can cover the entire machine, including attachments, to help protect your investments.

Operation. Improving operating techniques can boost your profits. Your Cat dealer has training videotapes, literature and other ideas to help you increase productivity.

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

Technology Products. Cat dealers offer a range of advanced mining technology products for customers, dealers and operators designed to improve fleet efficiency, increase productivity and lower costs.

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

Safety

Caterpillar mining machines and systems are designed with safety as their first priority.

Product Safety. Caterpillar has been and continues to be proactive in developing mining machines that meet or exceed safety standards. Safety is an integral part of all machine and systems designs.

Engine Shut Off Switch. A secondary engine shutoff switch is located at ground level.

Brake Systems. Four corner oil-cooled braking system provides excellent control. The service brake system is actuated by modulated hydraulic pressure, while the parking brake function is spring applied and hydraulic released. This system assures braking in the event of hydraulic failure.

Protective Structure. The operator station has integrated into its construction a ROPS – Roll-over protective structures and FOPS – Falling object protective structures. This structure is resiliently mounted to the frame, reducing vibration to the operator for a more comfortable ride.

Standard Safety Features.

- Anti-skid upper deck surfaces
- Lower cab light
- Ground level compartment sight glasses
- Increased visibility
- 3-point access to cab and machine
- Push out safety glass
- Suspension seat
- Inertia reel retractable seat belt
- Lift arm support pins
- Hot and cold side of engine

- Steering frame lock
- Hinged belly guards
- Firewall
- Shielded Exhaust

Engine

Engine Model	Cat® 3176C EUI ATAAC	
Rated Power	2,100 rpm	
Gross Power – SAE J1995	185/200 kW	248/268 hp
Net Power – SAE J1349	165/180 kW	221/241 hp
Net Power – ISO 9249	165/180 kW	221/241 hp
Net Power – 80/1269/EEC	165/180 kW	221/241 hp
Bore	125 mm	4.9 in
Stroke	140 mm	5.5 in
Displacement	10.3 L	629.4 in^3

- Power ratings apply at a rated speed of 2,100 rpm when tested under the reference conditions for the specified standard.
- Ratings based on SAE J1995 standard air conditions of 25° C (77° F) and 100 kPa (29.61 Hg) barometer. Power based on fuel having API gravity of 35 at 16° C (60° F) and an LHV of 42 780 kJ/kg (18,390 BTU/lb) when engine used at 30° C (86° F).
- Engine derate will commence at an altitude of 3000 m (9,842.5 ft).
- Compliant with U.S. Environmental Protection Agency Tier 2 emissions standards.

Operating Specifications

Nominal Payload Capacity	10 200 kg	22,487 lb
Gross Machine Operating Weight	29 800 kg	65,698 lb
Static Tipping Load Straight Ahead Lift Arms Horizontal	28 100 kg	61,950 lb
Static Tipping Load Full Turn Lift Arms Horizontal	23 500 kg	51,809 lb
Breakout Force (SAE)	19 280 kg	42,505 lb

Weights

Empty	29 800 kg	65,698 lb
Front Axle	12 516 kg	27,593 lb
Rear Axle	17 284 kg	38,105 lb
Loaded	40 000 kg	88,185 lb
Front Axle	28 000 kg	61,729 lb
Rear Axle	12 000 kg	26,456 lb

Transmission

Forward 1	5 km/h	3.1 mph
Forward 2	8.7 km/h	5.4 mph
Forward 3	15.2 km/h	9.5 mph
Forward 4	22.1 km/h	13.7 mph
Reverse 1	5.7 km/h	3.5 mph
Reverse 2	9.9 km/h	6.2 mph
Reverse 3	17.2 km/h	10.7 mph
Reverse 4	23.8 km/h	14.8 mph

Hydraulic Cycle Time

Raise	7.6 Seconds
Dump	1.6 Seconds
Lower, empty, float down	2 Seconds
Total Cycle Time	11.2 Seconds

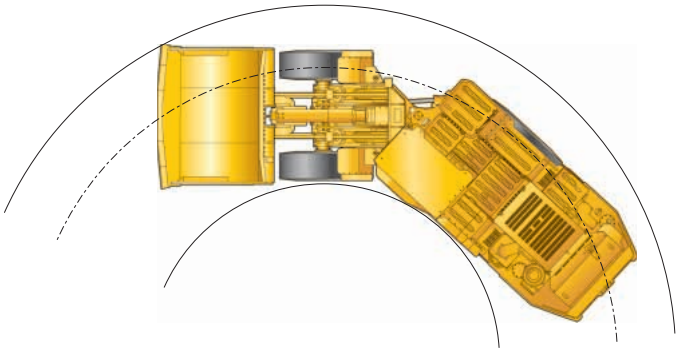
Bucket Capacities

Bucket Capacity – Std.	4.8 m^3	6.3 yd^3
Bucket Width (Over cutting edge)	2600 mm	102.4 in
Bucket Capacity – Optional	4.2 m^3	5.5 yd^3
Bucket Capacity – Optional	5.6 m^3	7.3 yd^3
Bucket Capacity – Optional	5.9 m^3	7.7 yd^3
Bucket Capacity – Optional (Ejector)	4.8 m^3	6.3 yd^3

Turning Dimensions

Outside Clearance Radius**	6638 mm	261.3 in
Inner Clearance Radius**	3291 mm	129.6 in
Axle Oscillation	10°	
Articulation Angle	42.5°	

**Clearance dimensions are for reference only.



Tires

Tire Size	18.00 × 25 – 28 PLY STMS L5S

Service Refill Capacities

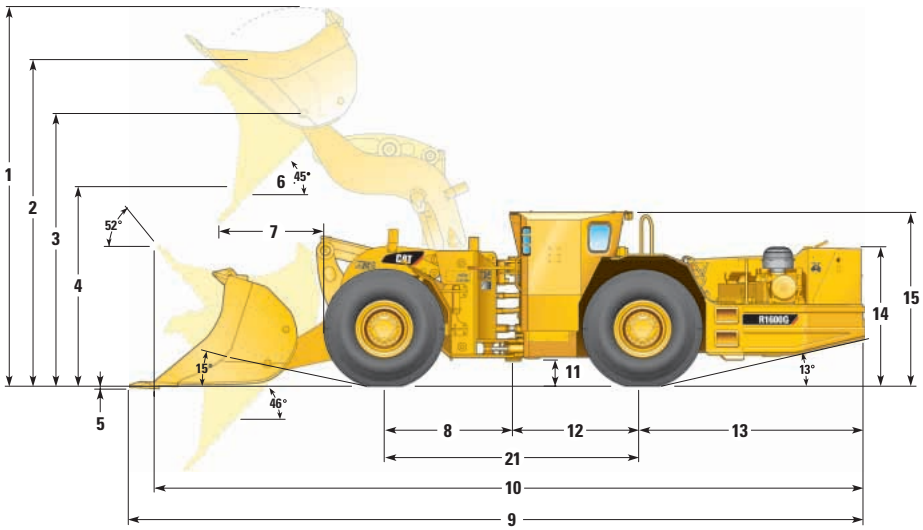
Engine Crankcase with Filter	36.1 L	9.5 gal
Transmission	47 L	12.4 gal
Hydraulic Tank	125 L	33 gal
Cooling System	53 L	14 gal
Front Differential and Final Drives	70 L	18.5 gal
Rear Differential and Final Drives	70 L	18.5 gal
Front Differential and Final Drives (With Axle Oil Cooler)	80 L	21.1 gal
Rear Differential and Final Drives (With Axle Oil Cooler)	80 L	21.1 gal
Fuel Tank	400 L	105.7 gal
Secondary Fuel Tank (If Equipped)	330 L	87.2 gal

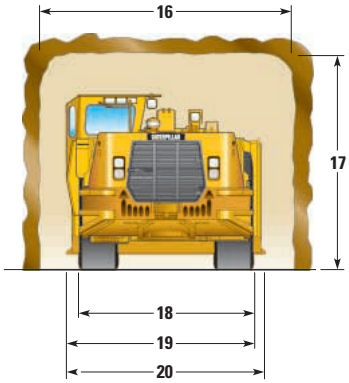
Standards

Brakes	ISO3450, AS2958.1, CAN-CSA424.30-M90
Cab/FOPS	BS EN ISO3449, SAEJ231, AS2294.3
Cab/ROPS	ISO3471, SAEJ1040, AS2294.2, EN13510

Dimensions

All dimensions are approximate.





		227-4702*	203-1792* (Standard Bucket)	227-4704	227-4703*	229-1676 Ejector Bucket
	Bucket capacity	4.2 m^3 (5.5 yd^3)	4.8 m^3 (6.3 yd^3)	5.6 m^3 (7.3 yd^3)	5.9 m^3 (7.7 yd^3)	4.8 m^3 (6.3 yd^3)
	Bucket width over cutting edge	2600 mm (8'6")	2600 mm (8'6")	2600 mm (8'6")	2900 mm (9'6")	2600 mm (8'6")
1	Overall height – bucket raised	5114 mm (16'9")	5204 mm (17'1")	5282 mm (17'4")	5242 mm (17'2")	5385 mm (17'8")
2	Maximum dump height	4497 mm (14'9")	4497 mm (14'9")	4497 mm (14'9")	4497 mm (14'9")	4565 mm (15')
3	Bucket pin height at maximum lift	3752 mm (12'3")	3752 mm (12'3")	3752 mm (12'3")	3752 mm (12'3")	3752 mm (12'3")
4	Dump clearance at maximum lift	2311 mm (7'7")	2207 mm (7'3")	2042 mm (6'8")	2114 mm (6'11")	2120 mm (6'11")
5	Digging depth	28 mm (1")	39 mm (2")	54 mm (2")	45 mm (2")	47 mm (2")
6	Dump angle at maximum lift	45°	45°	45°	45°	45°
7	Reach	1304 mm (4'3")	1408 mm (4'7")	1573 mm (5'2")	1504 mm (4'11")	1495 mm (4'11")
8	Centerline of front axle to centerline of hitch	1768 mm (5'7")	1768 mm (5'7")	1768 mm (5'7")	1768 mm (5'7")	1768 mm (5'7")
9	Overall length (digging)	9955 mm (32'8")	10 107 mm (33'2")	10 347 mm (33'11")	10 243 mm (33'7")	10 233 mm (33'7")
10	Overall length (tramming)	9619 mm (31'1")	9711 mm (31'10")	9853 mm (32'4")	9790 mm (32'1")	9948 mm (32'8")
11	Ground clearance	344 mm (1'6")	344 mm (1'6")	344 mm (1'6")	344 mm (1'6")	344 mm (1'6")
12	Centerline of back axle to centerline of hitch	1768 mm (5'9")	1768 mm (5'9")	1768 mm (5'9")	1768 mm (5'9")	1768 mm (5'9")
13	Length – rear axle to bumper	3055 mm (10')	3055 mm (10')	3055 mm (10')	3055 mm (10')	3055 mm (10')
14	Height to top of hood	1895 mm (6'3")	1895 mm (6'3")	1895 mm (6'3")	1895 mm (6'3")	1895 mm (6'3")
15	Height to top of ROPS	2400 mm (7'11")	2400 mm (7'11")	2400 mm (7'11")	2400 mm (7'11")	2400 mm (7'11")
16	Tunnel clearance width**	3500 mm (11'6")	3500 mm (11'6")	3500 mm (11'6")	3500 mm (11'6")	3500 mm (11'6")
17	Tunnel clearance height**	3000 mm (9'10")	3000 mm (9'10")	3000 mm (9'10")	3000 mm (9'10")	3000 mm (9'10")
18	Overall tire width	2400 mm (7'11")	2400 mm (7'11")	2400 mm (7'11")	2400 mm (7'11")	2400 mm (7'11")
19	Overall width excluding bucket	2564 mm (8'5")	2564 mm (8'5")	2564 mm (8'5")	2564 mm (8'5")	2564 mm (8'5")
20	Overall width including bucket	2723 mm (8'11")	2723 mm (8'11")	2723 mm (8'11")	3018 mm (9'11")	2723 mm (8'11")
21	Wheelbase	3536 mm (11'7")	3536 mm (11'7")	3536 mm (11'7")	3536 mm (11'7")	3536 mm (11'7")

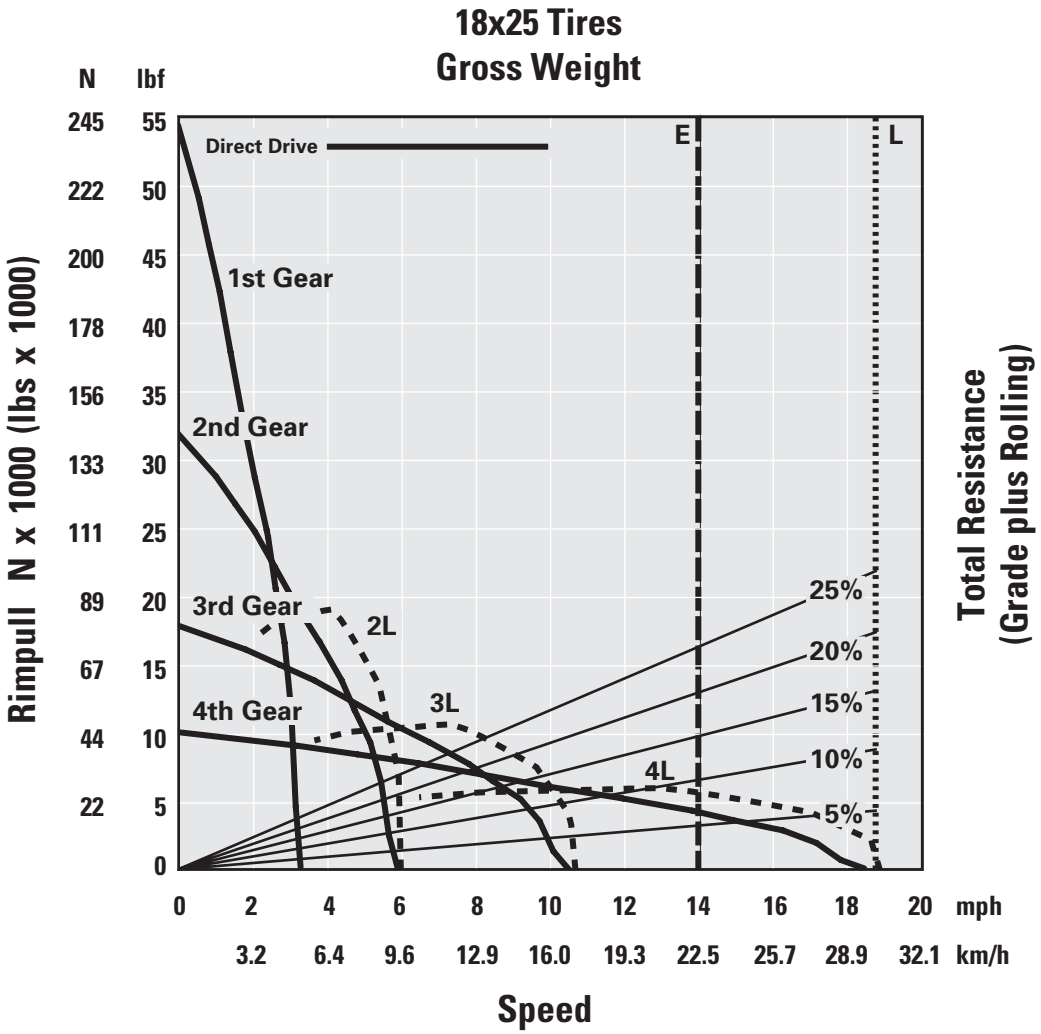
*Dimensions shown with standard material bucket sizes. High penetration bucket versions also available

**Clearance dimensions are for reference only.

Gradeability/Speed/Rimpull

To determine gradeability performance: Read from gross weight down to the percent of total resistance. Total resistance equals actual percent grade plus rolling resistance. As a general guide use 2% for rolling resistance in underground applications or refer to the Caterpillar Performance Handbook. From the total resistance point, read horizontally to the curve with the highest obtainable gear, then down to maximum speed. Usable rimpull will depend upon traction available and weight on drive wheels.

Typical Field Empty Weight
Loaded Weight



E – Empty 29 800 kg (65,698 lb)
L – Loaded 40 000 kg (88,185 lb)

Standard Equipment

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

Electrical
- Alternator, 95-amp
- Battery Disconnect Switch, Ground Level
- Circuit Breaker, 80-amp
- Corrosive Protection Spray
- Diagnostic Connector
- Electric Starting, 24-volt
- Engine Shutdown Switch
- External Lighting System, Front, Rear
- Low Maintenance Batteries
- Reversing Alarm
- Starting and Charging System

Operator Environment
- Caterpillar Electronic Monitoring System (CEMS)
- Electric Horns
- Gauges
  - Engine Coolant Temperature
  - Fuel Level
  - Hydraulic Oil
  - Speedometer
  - Tachometer
- Pilot Hydraulic Implement Controls, Single Joystick
- ROPS/FOPS Structure
- Suspension Seat With Retractable Seat Belt
- Wheel Steer

Power Train
- Cat 3176C EUI ATAAC Diesel Engine
- Engine Air Intake Precleaner
- Technology, 6-Cylinder
- Long Life Coolant
- SAFR™ Full Hydraulic Enclosed Wet Multiple-Disc Brakes
- Heat Shields
- Planetary Powershift Transmission with Automatic Shift Control, 4 Speed Forward/4 Speed Reverse
- Torque Converter with Automatic Lockup Clutch
- Transmission Neutralizer

Other Standard Equipment
- Brake Axle Cooling
- Bucket Positioner, Return To Dig
- Catalytic Exhaust Purifier/Muffler Group
- Engine and Transmission Belly Guards
- Fenders, Front, Rear
- Firewall
- Hydraulic Oil Cooler – Swing Out
- Rear Frame Protection Wear Bars, 100 × 50 mm (4 × 2 in)
- Swing Out Radiator Grill
- Tires, 18.00 × 25 – 28 PLY STMS L5S

Optional Equipment

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

Alternative Tire Arrangements
Automatic Lube System
Auxiliary Start Receptacle
Brake Light
Brake Pressure Gauges
Brake Release Arrangements
Bucket Heel Shrouds
Bucket Sacrificial Wear Strip Package
Centralized Lube System, Manual
Draw Bar Attachment, Bolt-on
Dual Fuel Tanks
Ejector Bucket Ready
Electronic Access Module
Fast Fill System
  Coolant
  Engine
  Fuel
  Hydraulic
  Transmission
Fire Extinguishers
Fire Suppression System
Front Light Protectors
Heater, Air Conditioning
Idle Timer
Oil Sample Adapters
Operators Station
  Air Conditioning
  Pressurizer
  Dome Light
  Radio Ready
Payload Control System (PCS)
Remote Activated Fire System
Remote Control Systems
  Proportional
  Retrieval Attachment
Residual Brake Pressure Light, Dash Mounted
Reversible Steering, Wheel Steer
Ride Control System
Seat Covers
Secondary Steering System
Service Tools
Starting Receptacle
STIC™ Steering
Tee Seat

R1600G Underground Mining Loader

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

Materials and specifications are subject to change without notice.
Featured machines in photos may include additional equipment.
See your Caterpillar dealer for available options.

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