

# Hydraulic Shovels

Product Line





## Built to Last

Proven success in nearly every surface mining application across the globe substantiates the durability of Cat<sup>®</sup> hydraulic shovels. Our equipment is engineered to endure the most difficult digging environments and the harshest conditions to afford our customers the greatest productivity. Simply stated, Cat hydraulic shovels are built to last.

### Hydraulic Shovels

Cat hydraulic shovels are versatile machines used to load overburden and ore into haul trucks during the mining process in surface mines of all types across the globe. Utilizing proven Cat technology, each hydraulic excavator model is designed to provide superior digging forces and optimal cycle times while withstanding the rigors of any digging environment encountered. Our substantial global installed base validates our experience and expertise in the hydraulic mining excavator market and reaffirms our commitment to it. With the widest payload range in the industry, Caterpillar is well-equipped to fulfill any hydraulic excavator need that global mining customers may have.

### Machine Service & Support

Caterpillar factory-trained service engineers are available throughout the world to provide our customers with the support necessary to meet their production requirements. Our service engineers have the knowledge and experience to bring a successful result to the most demanding projects. In addition, they are backed by Caterpillar's team of engineers, who have design-based knowledge not available from other sources.

## TriPower™

Caterpillar uses a unique boom design that employs rotatable triangular rockers to generate superior mechanical leverage and control. This unique Caterpillar design results in:

- Increased effective lifting force
- Constant boom momentum
- Automatic constant bucket angle position in horizontal and vertical direction
- Automatic roll-back limiter

Furthermore, the TriPower system enables Cat face shovels to use smaller-diameter boom cylinders. This benefit results in fast lifting speeds to outperform the competition.

## Efficient Drive Systems

Cat hydraulic shovels are equipped with one or two diesel engines or an electric option. On models equipped with two engines, the hydraulic excavator remains operational with only a single engine running, maintaining full availability. The electric drive is used on mainly stationary-operated machines and offers superior availability because it doesn't require time to refuel and servicing the motor is minimized.

## Pump Managing System

The pump managing system continuously evaluates actual engine and hydraulic operating values against set values and adjusts pump output for optimal performance. This results in an efficient use of the engine for greater productivity.

## Superior Oil Cooling System

The cooling system utilizes dedicated pumps to provide cooling capacity as needed, whether the engine is idling or under load, whereas our competitors' machines only provide cooling when the engine is under load and the excavator is working. Consequently, on Cat hydraulic shovels, the hydraulic oil circulates through the cooling system even when the excavator is waiting for the next truck. This system provides a more efficient means of cooling, particularly in demanding applications. The radiator fan speed is thermostatically or electronically controlled for greater efficiency.



*TriPower™*



*Diesel engine drive system*



*Main hydraulic valve block*



*Sturdy undercarriage*

### **Closed-Loop Swing Circuit**

The Cat closed-loop swing circuit results in fast boom lift motions during swing. The kinetic energy of the swing motion is used during deceleration to support driving the main and auxiliary pumps. Compared to open circuits, the Cat closed-loop swing circuit is more energy-efficient, generates less heat and delivers faster speeds.

### **Simple & Efficient Hydraulic System**

The main hydraulic valve block is located on top of the boom. This design reduces the total number of hoses that are needed and ensures they're neatly organized for safe operation, easy inspection and fast service.

Because float valves are used to lower the boom instead of engaging pumps, the boom moves faster and other operating functions can occur simultaneously, such as bucket curl and stick in/out. This results in faster cycle times.

### **Sturdy Undercarriage**

Cat undercarriages are tough and long-lasting. Engineered with extensive use of Finite Element Analysis (FEA), the steel structure is optimized, travel motors are well-protected by strong cover plates and hinged door covers, and a unique robust track chain incorporates a combined pad/link design on most models. A state-of-the-art track-tensioning system automatically adapts the tensioning of the tracks depending on operating conditions, extending the track life even further.

### **Monitoring and Diagnostic System**

Enhancing diagnostic capabilities and providing detailed troubleshooting functions, the Board Control System uses sensors throughout the machine to monitor operating data, record faults, and notify the operator audibly and visually. This promotes the earliest possible detection of faults and allows for timely maintenance planning and assistance for speedy repair.

## Electro-Hydraulic Control System

All larger-model Cat hydraulic shovels use an electro-hydraulic control system that electronically relays actuating signals from hand levers. Simplified troubleshooting and advanced diagnostic routines lead to increased uptime. The design delivers fast and precise machine reactions, which reduce operator fatigue and increase efficiency. For greater comfort, joystick preferences are operator-adjustable. And since no hydraulic lines are inside or underneath the cab, it's a more comfortable and clean work environment.

## Machine Accessibility

Systems throughout Cat hydraulic shovels are designed for easy access, enhancing serviceability.

- Hydraulic Valve Block – The valve block is located on the boom where it's cleanly laid out and easily accessed by walkways on both sides. This reduces the number of hoses leading from the superstructure.
- Superstructure – Exceptional accessibility is provided to systems like the swing motor, swing gearbox and rotary distributor in the well-organized superstructure. The engine is accessible from three sides on most models.

Cat hydraulic shovels are equipped with retractable access ladders. A less steep 45° folding stairway is available as an option. An exit harness kit or a kick-down type, cage-equipped ladder allows for safe egress in case of emergency.



*Board Control System*



*Accessibility*

## Safe, Comfortable Cab Design

Cat hydraulic excavator cabs have a falling object protection system (FOPS) and meet DIN ISO 3449 standards. They are equipped with comfortable multi-adjustable chairs, ample legroom, excellent visibility, temperature control, sound abatement and ergonomically-designed controls.

- Windows: Safety glass is used for all windows and armored glass for the windshield.
- Seating: The pneumatically-cushioned, multi-adjustable seat enhances operator productivity and includes a safety switch in the cushion that automatically neutralizes the hydraulic controls when the operator leaves the seat.
- Display: A large, transfective color screen displays monitoring and diagnostic data for convenient troubleshooting and service assistance.
- Five languages can be selected: English, French, German, Spanish and Russian.



*Safe, comfortable cab design*

## Safe Bucket Control

The TriPower roll-back limiter prevents the bucket from being curled back too far and minimizes the potential for material to spill onto the attachment or the cab. Lifting the bucket automatically in constant-angle position requires just a single lever actuation.

## Emergency Shut-Offs

An easily-accessible, standard shut-off switch located in the cab shuts down the electrical system in case of emergencies. Additional shut-off switches are located on the machine (e.g., in the machine house) or are accessible from the ground with pull ropes.





- 93.6 tonne (103 ton) payload capacity – largest hydraulic excavator in the market
- Operating weight: 980 tonnes (1,080 tons)
- Engine output: 3 360 kW (4,500 hp)
- Standard bucket size: 52 m<sup>3</sup> (68 yd<sup>3</sup>)
- 3-pass load – Cat 795F and Unit Rig MT4400
- 4-pass load – Cat 797F, Unit Rig MT5500 and Unit Rig MT6300
- Available in electric or diesel drive
- 5-circuit hydraulic system
- Closed-loop swing circuit with torque control
- All major components are stress-relieved after welding to minimize internal stresses
- Automatic central lubrication system
- Rugged, high-stability undercarriage
- Spacious cab with ergonomically-designed controls for added operator comfort

## 6060



- 61 tonne (67 ton) payload capacity
- Operating weight: 562-565 tonnes (620-622 tons)
- Engine output: 2 240 kW (3,000 hp)
- Standard bucket size: 34 m<sup>3</sup> (44.50 yd<sup>3</sup>)
- 3-pass load – Cat 789C and Unit Rig MT3700
- 4-pass load – Cat 793D and Unit Rig MT4400
- Available in diesel or electric drive
- 5-circuit hydraulic system
- Closed-loop swing circuit with torque control
- All major components are stress-relieved after welding to minimize internal stresses
- Automatic central lubrication system
- Spacious cab with ergonomically-designed controls for added operator comfort
- Rugged, high-stability undercarriage
- Optional face shovel or backhoe configuration

## 6050



- 50 tonne (55 ton) payload capacity
- Operating weight: 525-534 tonnes (579-589 tons)
- Engine output: 1 880 kW (2,520 hp)
- Standard bucket size: 28 m<sup>3</sup> (36 yd<sup>3</sup>)
- 3-pass load – Cat 785D and Unit Rig MT3300
- 4-pass load – Cat 789C and Unit Rig MT3700
- Available in diesel drive
- 5-circuit hydraulic system
- Closed-loop swing circuit with torque control
- All major components are stress-relieved after welding to minimize internal stresses
- Automatic central lubrication system
- Spacious cab with ergonomically-designed controls for added operator comfort
- Rugged, high-stability undercarriage
- Optional face shovel or backhoe configuration



- 40 tonne (44 ton) payload capacity
- Operating weight: 397 tonnes (438 tons)
- Engine output: 1 516 kW (2,032 hp) /1 492 kW (2,000 hp)
- Standard bucket size: 22 m<sup>3</sup> (28.80 yd<sup>3</sup>)
- 3-pass load – Cat 777F Mining Truck
- 4-pass load – Cat 789C, Cat 785D and Unit Rig MT3300
- Available in electric or diesel drive5-circuit hydraulic system
- Closed-loop swing circuit with torque control
- All major components are stress-relieved after welding to minimize internal stresses
- Automatic central lubrication system
- Spacious cab with ergonomically-designed controls for added operator comfort
- Rugged, high-stability undercarriage
- Optional face shovel or backhoe configuration



- 30 tonne (34 ton) payload capacity
- Operating weight: 287-290 tonnes (316-319 tons)
- Engine output: 1 140 kW (1,530 hp) /1 008 kW (1,350 hp)
- Standard bucket size: 17 m<sup>3</sup> (22.20 yd<sup>3</sup>)
- 3-pass load: Cat 777F Mining Truck
- 4-5-pass load – Cat 785D and Unit Rig MT3300
- Available in electric or diesel drive
- 5-circuit hydraulic system
- Closed-loop swing circuit with torque control
- All major components are stress-relieved after welding to minimize internal stresses
- Automatic central lubrication system
- Spacious cab with ergonomically-designed controls for added operator comfort
- Rugged, high-stability undercarriage
- Optional face shovel or backhoe configuration



## 6018




- 18 tonne (20 ton) payload capacity
- Operating weight: 172 tonnes (190 tons)
- Engine output: 858 kW (1,150 hp)
- Standard bucket size: 10 m<sup>3</sup> (13.10 yd<sup>3</sup>)
- 3-pass load – Cat 773F
- 4-pass load – Cat 775F
- Available in electric or diesel drive
- 3-circuit hydraulic system
- Closed-loop swing circuit with torque control
- All major components are stress-relieved after welding to minimize internal stresses
- Automatic central lubrication system
- Spacious cab with ergonomically-designed controls for added operator comfort
- Rugged, high-stability undercarriage
- Optional face shovel or backhoe configuration

## 6015



- 12.6 tonne (13.8 ton) payload capacity
- Operating weight: 105 tonnes (116 tons)
- Engine output: 522 kW (700 hp) /477 kW (640 hp)
- Standard bucket size: 7.0 m<sup>3</sup> (9.2 yd<sup>3</sup>)
- 2-3-pass load – Cat 770
- 3-4-pass load – Cat 772
- Utilized in both quarry and mine site applications
- 3-circuit hydraulic system
- Triple-race swing roller bearing
- Closed-loop swing circuit with torque control
- Automatic central lubrication system
- Spacious cab with ergonomically-designed controls for added operator comfort
- Rugged, high-stability undercarriage
- Optional face shovel or backhoe configuration

Excavator									
PRODUCT	OPERATING WEIGHT	SHOVEL	BACKHOE	OUTPUT	785D MT3300	789C MT3700	793D MT4400	795F MT5500	797F MT6300
<b>6090</b>	980 tonnes (1,080 tons)	52 m <sup>3</sup> (68.0 yd <sup>3</sup> )	N/A	3 360 kW (4,500 hp)			3 passes	3-4 passes	4 passes
<b>6060</b>	562-565 tonnes (620-622 tons)	34 m <sup>3</sup> (44.5 yd <sup>3</sup> )	34 m <sup>3</sup> (44.5 yd <sup>3</sup> )	2 240 kW (3,000 hp)		3 passes	3-4 passes	5 passes	6 passes
<b>6050</b>	525-534 tonnes (579-589 tons)	26 m <sup>3</sup> (34 yd <sup>3</sup> )	28 m <sup>3</sup> (36.6 yd <sup>3</sup> )	1 880 kW (2,520 hp)	3 passes	4 passes	4-5 passes	6-7 passes	7-8 passes
<b>6040</b>	397 tonnes (438 tons)	22 m <sup>3</sup> (28.8 yd <sup>3</sup> )	22 m <sup>3</sup> (28.8 yd <sup>3</sup> )	1 492-1 516 kW (2,000-2,032 hp)	4 passes	5 passes	5-6 passes		
<b>6030</b>	287-290 tonnes (316-319 tons)	16.5 m <sup>3</sup> (21.6 yd <sup>3</sup> )	17 m <sup>3</sup> (22.2 yd <sup>3</sup> )	1 008-1 140 kW (1,350-1,530 hp)	4-5 passes	6 passes			
<b>6018</b>	172-175 tonnes (190-193 tons)	10 m <sup>3</sup> (13.1 yd <sup>3</sup> )	10 m <sup>3</sup> (13.1 yd <sup>3</sup> )	858 kW (1,150 hp)	7-8 passes				
<b>6015</b>	105 tonnes (116 tons)	7 m <sup>3</sup> (9.2 yd <sup>3</sup> )	6.0/7.0 m <sup>3</sup> (7.8-9.2 yd <sup>3</sup> )	477-522 kW (640-700 hp)					

#### 6090

3-pass load – Cat 795F and Unit Rig MT4400  
4-pass load – Cat 797F, Unit Rig MT5500 and Unit Rig MT6300

#### 6060

3-pass load – Cat 789C and Unit Rig MT3700  
4-pass load – Cat 793D and Unit Rig MT4400

#### 6050

3-pass load – Cat 785D and Unit Rig MT3300  
4-pass load – Cat 789C and Unit Rig MT3700

#### 6040

3-pass load – Cat 777F  
4-pass load – Cat 785D, Cat 789C and Unit Rig MT3300

#### 6030

3-pass load – Cat 777F  
4-5 pass load – Cat 785D and Unit Rig MT3300

#### 6018

3-pass load – Cat 773F  
4-pass load – Cat 775F

#### 6015

2-3 pass load – Cat 770  
3-4 pass load – Cat 772  
4-5 pass load – Cat 773F

# Hydraulic Shovels – Product Line

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at [mining.cat.com](http://mining.cat.com) and [www.cat.com](http://www.cat.com)

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