

HW300

Highwall Mining System



Weight (without Cutter Module)

Machine Weight	225 000 kg	495,665 lb
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Mine Mode Dimensions (without Cutter Module)

Width	11.7 m	38.5 ft
Height	8.7 m	28.7 ft
Length	20.3 m	66.5 ft

Operating Specification

Maximum Penetration Capability	305 m	1,000 ft
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Features

Maximum Extraction

Low cost coal to traditional mining methods.

Safe Operation

The entire mining cycle is completed by a three- or four-man crew, with no personnel going underground at any time.

Excellent Mobility

The highwall miner trams easily from entry to entry and discharges coal in tight spaces.

Operator Comfort

The air-conditioned cab offers an ergonomic workplace where all controls are within the operator’s reach.

Easy Equipment Relocation

The highwall mining system can be taken apart in modules – sized for transport using regular public roads.

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Linking underground and surface mining operations, the Cat® Highwall Mining System is a testament to innovative mining equipment. The HW300 offers a safe and innovative method for extracting coal from exposed seams in a multitude of applications.

The Highwall Mining Method

Extracting coal affordably and safely.



Feasibility Determination

Our highly skilled experts are eager to assist you to determine the feasibility of your highwall mining project. The Caterpillar team uses an evaluation of your geological data and site plan to determine how best to use a Cat highwall mining system.



Highwall mining is a proven primary method for mining coal from exposed seams. In this method of mining, an unmanned cutter module is driven underground and operated in front of the highwall.

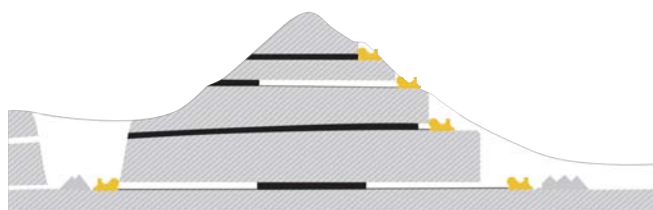
The highwall mining machine stands on the pit floor or on a bench, directly in front of the exposed seam and makes long parallel rectangular drives into the coal seam.

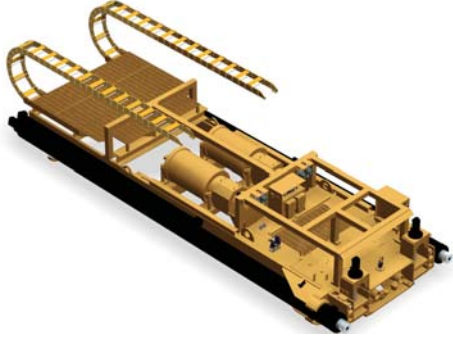
A remote-operated cutter module is pushed into the seam by a string of push beams (unmanned coal-conveying elements) that transport the mined coal back to the entry of the drive onto a stockpile. The whole mining cycle is completed by a three- or four-man crew, with no personnel going underground at any time.

The self-contained Cat highwall mining system offers an innovative method for extracting coal from exposed seams in a multitude of applications.

Whether you're operating a trench, open cast or contour mine, the Cat highwall mining system can extract coal affordably and safely:

- **Open cast:** Highwall mining is used to mine coal from underneath the final highwall, when the strip limit is reached due to economic reasons or surface conditions
- **Contour mining:** In a mountainous area, the Cat highwall mining system can follow a coal seam along the side of the hill
- **Trench mining:** The unit mines coal from both sides of a purpose-prepared trench; this mining method is used when an open pit is not an option





Cutter Module

Proven technology for accurate cuts.

Power Head

Providing the forces for optimal performance.

Heavy Duty Power Head Assembly

The power head drives the cutter module and push beam string forward using two hydraulically-powered sump cylinders with a 6.86 m (22.5 ft) stroke.

The pushing force of 133 tonnes (147 tons) propels the cutter module to a depth of 300 m (1,000 ft) and the pulling force of 275 tonnes (303 tons) retracts it safely.

Proven Cutter Module

Caterpillar offers two electric cutter modules: a low-profile cutter module for seams 0.76-1.62 m (2.5-5.3 ft) in height and a mid-seam cutter module to mine 1.3-3.05 m (4.3-10 ft) seams. The cutter modules are interchangeable and quickly attached to the power head assembly. The cutting cycle is fully automated, yet allows the operator to manually adjust the machine function using an ampere reading as the coal seam varies. This proven technology allows the cutter module to accurately follow the coal seam and produce a clean product.

Advanced Technology

An optional Gamma Detection system can be used to guide the cutter module through the coal seam, leaving predetermined amounts of coal in the roof and floor. This system also allows the mining of coal in soft roof and/or soft floor situations. For even more accurate directional mining operation.

Caterpillar offers an optional solid-state, fiber-optic, gyro-based navigation and steering system. This provides operators with very precise cutter module location data in real time for enhanced cutter module steering and pillar width control.





Mobility

Improved maneuverability in tight spaces.

Excellent Mobility

The Cat highwall mining system is an agile, self-propelled machine that operates on contour benches as narrow as 18 m (59 ft). It trams easily from entry to entry and discharges coal in tight spaces. An optional right-angle conveyor system discharges coal on the right or left side on narrow benches. It can also discharge onto a stacking conveyor system, where coal is moved to the center of the bench for stockpiling large volumes.

Four heavy-duty, hydraulically-powered tracks articulate independently in two operating modes – mine mode and tram mode – and can rotate the machine 360°, which improves maneuverability in congested areas. Mine mode is used for moving parallel to the highwall, while tram mode is used when moving from pit to pit.

Operator Comfort

Ergonomic design for comfort, control and productivity.

Operator Comfort

The Cat highwall mining system is equipped with a comfortable, climate controlled, pressurized cab that offers a full view of the mining operation and the highwall. The full suspension operator seat and the two user-friendly touchscreens create an ergonomic workplace, placing controls and system information at the operator's fingertips.



Push Beams

The backbone of the highwall mining system.



Dependable Push Beams

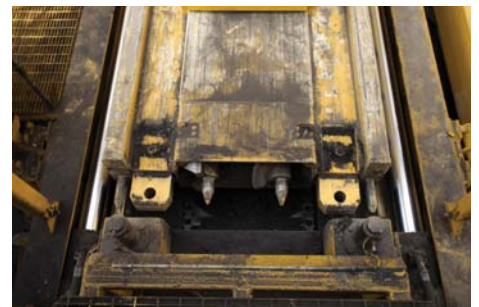
Cat push beams are 6 m (20 ft) long, rectangular, reinforced steel box structures joined together to form a string, which connects the highwall mining system to the cutter module.

The push beam string is the backbone of the machine; pushing and pulling the cutter module in and out of the coal seam.

The push beam conveys mined coal inside. The enclosed beam protects the coal from contamination and supports the hose chain that supplies control and power to the cutter module.

Other Cat push beam advantages include:

- A strong method of attachment that is secured and disengaged quickly
- A push beam connection that allows the string and cutter module to navigate through coal seam rolls and undulations
- A simple design free of electrical and hydraulic connections
- Push beams that can be stacked six high reduced storage area in narrow work sites, even under tough pushing and pulling conditions

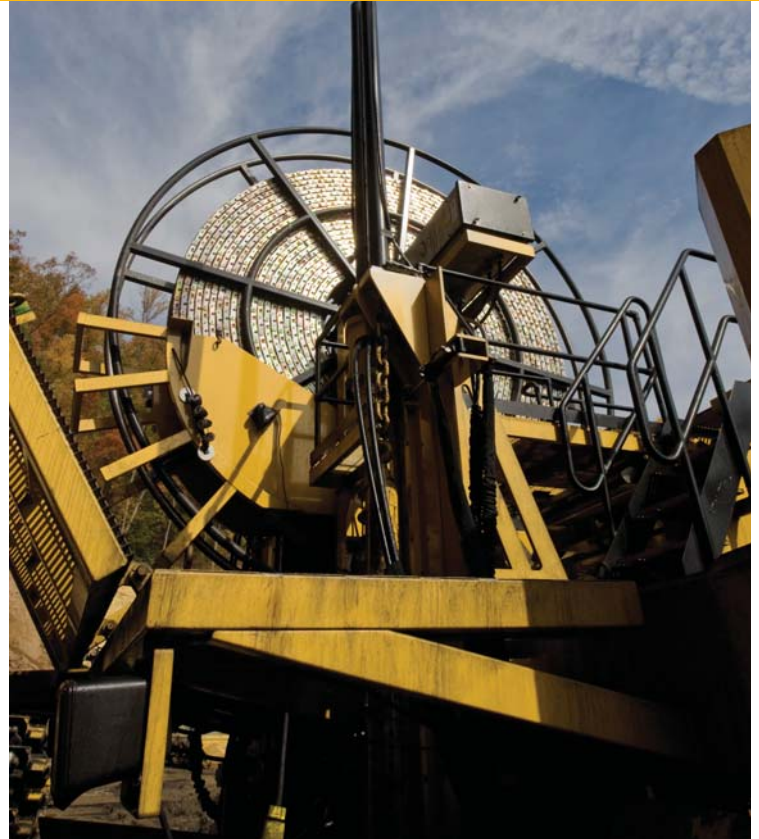


Reel and Chain

Storage and protection of cables and hoses.

Robust Reel and Chain

A steel-armored hose chain stores and protects all electric power cables, hydraulic and coolant lines, and the control cable to the cutter module. The hose chain is automatically unrolled and retracted on a reel during mining.



Control System

Keeping the operation productive.



Control System with Diagnostics

The Cat highwall mining system's operation is controlled by a Programmable Logic Controller, which provides reliable performance for greater uptime. A comprehensive diagnostics system, including troubleshooting assistance, streamlines maintenance procedures.



Anchoring System

Maximum Stabilization even under toughest conditions.

Anchoring System

Two drills mounted on the front of the machine are used to drill into the pit floor up to 2.4 m (8 ft). High-strength pins are then inserted through the base frame into the pit floor to help stabilize the machine and to maintain its accurate position, even under tough pushing and pulling conditions.

Equipment Relocation

Convenient modularity for quick assembly.

Easy Machine Relocation

For quick relocation over long distances, the Cat highwall mining system can be taken apart in modules. Rapid disassembly and reassembly is facilitated by convenient hydraulic and electrical connectors, and all modules are sized for transport using regular public roads.

Depending on local conditions, the system can also be transported between sites and without disassembly by heavy haul trucks.





Safety

Designed with safety as the first priority.

The Cat highwall mining system is engineered and equipped with a priority on safe operation; safety features include:

Elevated cab with cameras – For a complete view of the highwall mining system and mining operation, the cab is elevated on the machine and three magnetic base cameras are provided whose positions can be easily and quickly adjusted.

Above-ground operation – Operation of the system is performed entirely on the surface with no crew members working underground.

Small-crew size – The highwall mining system only requires a three- to four-person crew for full operation.

Remote operation – The machine can be operated and trammed up to 61 m (200 ft) away via laptop.

Anchoring system – Two drills mounted on the front of the machine are used to drill into the pit floor up to 2.4 m (8 ft). High-strength pins are then inserted through the base frame into the pit floor to help stabilize the machine and to maintain its accurate position, even under tough pushing and pulling conditions.

Support

Services to keep your equipment productive.

Product Support

Every HW300 is backed by 24/7 support from highly skilled and experienced staff. Large warehouse stocks with spare parts ensure the highest levels of machine uptime, and service and parts back-up can be tailored to your needs.

Training

Caterpillar can arrange operational and technical training which covers every aspect of the HW300 Highwall Miner. A two-week training program from the Caterpillar facility in Beckley, West Virginia, USA, is offered to new customers and to existing customers as a refresher.



HW300 Highwall Mining System Specifications

Environmental and Operational Conditions

The Cat HW300 is designed for following environmental and operating conditions:

Mine Application	Trench Application Open Pit Mining Contour Mining
Ambient Temperature	–30° C to +35° C (–22° F to 95° F) Arctic and Tropical Packages are optional
Pit Floor Gradient	8 degrees nominal in any direction, 10 degrees maximum in any direction for traveling
Maximum Seam Gradient	8 degrees down dip relative to horizontal (Level side-to-side, pit floor prepared at 3 degrees)

Power and Consumption

Electric Power (Installed) 995 VAC, 50/60 Hz Mid Seam Cutter Module Rear Discharge Machine

Function	Qty	Volts	Power (ea)		Total Power	
			kW	Hp	kW	Hp
Cutting Motors	2	995	179	240	350	470
Gathering Motors	2	995	33.5	45	100	134
Horizontal Auger Motors	2	995	298	400	597	800
Hydraulic Pump Motor	1	995	224	300	224	300
Base Frame Conveyor Motor	1	995	75	100	75	100
Right Angle Conveyor Motor	1	995	75	100	75	100
Stacking Conveyor Motor (Customer Equipment)	1	995	75	100	75	100
Cooling Fan Motors	4	480	1.5	2	6	8
Water Circulating Pump Motor	1	480	7	10	7	10
Hydraulic Oil Circulating Pump Motor	1	480	11	15	11	15
Water Spray Pump Motor	1	480	5.5	7.5	5.5	7.5
Air Compressor Motor	1	480	4	5	4	5
TOTAL					1525	2,045

Power for the Miner

A self-contained generator system provides electrical power to the highwall mining system in remote locations where connection to a utility grid is not practical.



Water Consumption

Water is not used in the coal-cutting process, however, some is required for dust-suppression purposes. Water consumption during the mining operation is an average of 1000 L (264 gal) per hour (estimate).

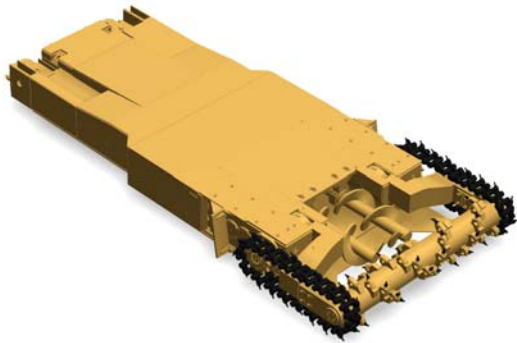
General Specifications

General Specifications	All dimensions and weights are approximate and depending on final specification.
Machine Dimensions while Mining	Width: 11.7 m (38.5 ft) Height: 8.7 m (28.7 ft) Length: LPCM: 20.3 m (66.5 ft) Mid-Seam CM: 21.3 m (70 ft)
Machine Dimensions while Tramming	Width: 7.7 m (25.3 ft) Track Width Height: 9.1 m (30 ft) Length: LPCM: 20.3 m (66.5 ft) Mid-Seam CM: 21.3 m (70 ft) Minimum road width for overhanging structure: 9.2 m (30.1 ft) with right-angle conveyor removed.
Weight	HWM without cutter head: 225 000 kg (495,665 lb) Weight: 5.150 kg (11,353.8 lb) – 50 pieces

Low Profile Cutter Modules

The low profile cutter module is specifically designed to work with the Cat HW300

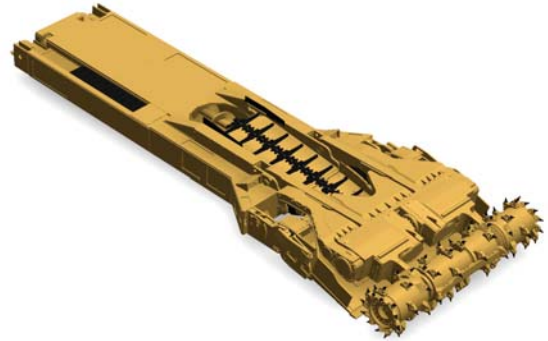
Cutter Drum Diameter – two options	65.1 cm (25 5/8 in) Diameter 71.12 cm (28 in) Diameter
Cutting Width	2.95 m (116 in)
Drum Drive	(2) 123 kW (165 hp)/995 VAC/60 Hz Electric Motors
Maximum Cutting Height	1.6 m (63 in)
(2) Hydraulic cylinders with integrated liner transducers to measure cutting height.	
Gathering System	Coal gathered by augers



331 Cutter Modules

The mid cutter module is a Cat design that employs a CM235 Cutting Boom and gathering pan assembly.

Cutter Drum Diameter	965 mm (38 in)
Drum Width	3.5 m (11 ft 6 in)
Drum Drive	(2) 175 kW (235 hp)/995 VAC/60 Hz
Gathering System	CLA System



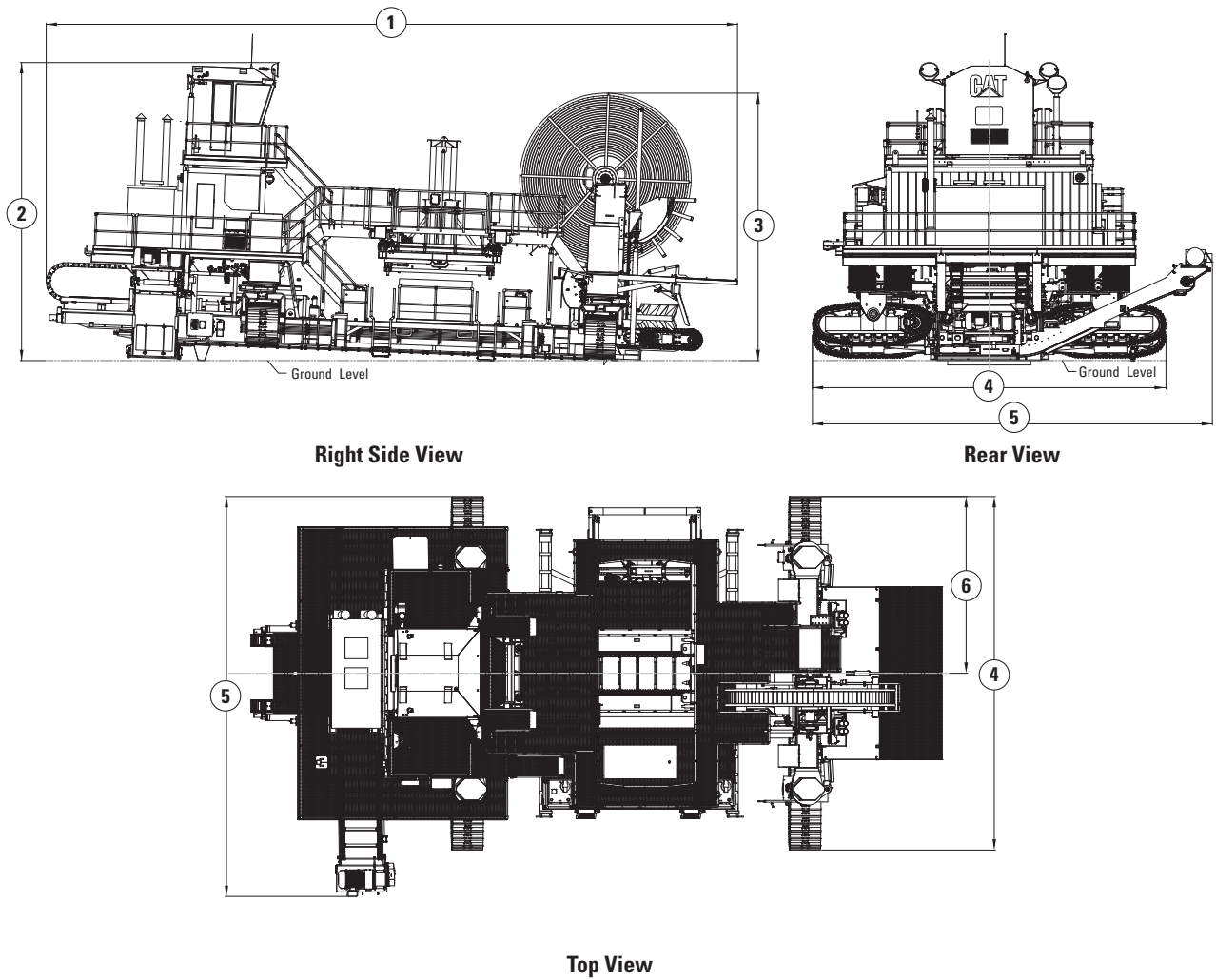
Optional

Navigation and Steering	An internal navigation device can be mounted in the cutter module for accurate heading and tracking of the position of the cutter module. It can also be controlled left and right by two steering cylinders.
Natural Gamma Sensor	Natural gamma sensors can be mounted to the top and/or the bottom of the cutter module. These sensors enables the operator to leave coal on the roof and/or floor to improve the coal quality or to enhance roof support in weak strata conditions.
Electric Controls	Electrical switch gears for the cutting motors is mounted in the Electrical Control Module of the HW300 System. Electronic controls are housed Electrical Enclosures aboard the Cutter Module.
Hydraulic Controls	Hydraulic valves are, where possible, integrated in a block. The valves are provided with explosion proof solenoids according to ATEX Ex classification.

HW300 Highwall Mining System Specifications

Dimensions

All dimensions are approximate.



HW300		
1 Overall Length	20 278 mm	66.5 ft
2 Overall Height	8743 mm	28.7 ft
3 Hose Reel Height	7844 mm	25.7 ft
4 Track Width	10 369 mm	34.0 ft
5 Overall Width	11 730 mm	38.5 ft
6 Half Track Width	5185 mm	17.0 ft

Optional Equipment

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

GAMMA DETECTION SYSTEM

- Used to guide the cutter module through the coal seam, leaving predetermined amounts of coal in the roof and floor. This system also allows the mining of coal in soft roof and/or soft floor situations.

TROPICAL PACKAGE

- For hot-climate applications, this package extends the operating temperature of the equipment up to 55° C (131° F).

ARCTIC PACKAGE

- For extreme-cold climates, this package extends the operating temperature to –40° C (–40° F).

RIGHT-ANGLE DISCHARGE

- This feature discharges coal to the right or left of the machine.

PUSH BEAM GRAPPLE

- This tool is mounted to the front of a wheel loader to provide safe and efficient transportation of push beams to and from the highwall mining system.

GENERATOR SET

- A self-contained generator system provides electrical power to the highwall mining system in remote locations where connection to a utility grid is not practical.

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and industry solutions, visit us on the web at **www.cat.com**

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AEHQ6802-01 (03-2013)
Replaces AEHQ6802

