

# 120M

## Motor Grader



**The Cat® M Series Motor Grader has become the industry standard in operational efficiency and overall productivity. From building roads to maintaining them, M Series Motor Graders are designed to help you get more work done in less time. Unprecedented operator comfort and ease of service help to maximize your return on investment.**

### **Joystick Controls**

Simple, intuitive joystick controls replace levers, so hand and arm movement is reduced by 78%, helping reduce operator fatigue for better productivity. Control pods are electronically adjustable so operators can easily achieve an ideal operating position. Features like Articulation Return to Center make operation even easier.

### **Operator Station**

Angled cab doors, tapered engine enclosure and a sloped rear window to make it easy to see the moldboard and tires, as well as behind the machine. A spacious cab, adjustable suspension seat and high capacity Heating, Ventilation and Air Conditioning (HVAC) give you a quieter, more comfortable working environment. An optional deluxe radio with CD features MP3 and Bluetooth technology.

### **Engine and Power Train**

A Cat C6.6 ACERT™ engine gives you the performance to maintain consistent grading speeds for maximum productivity. Superior torque and lugging capability provide the power to pull through sudden, short-term increases in loads. A smooth shifting transmission enables precise results and provides outstanding performance with automatics.

A hydraulic demand fan automatically adjusts speed according to engine cooling needs, so when cooling demand is reduced, you benefit from more power to the ground and improved fuel efficiency.

The sealed front axle spindle is oil bathed and places the larger tapered roller bearing on the outside to give you greater service life. Oil-bathed multi-disc service brakes are hydraulically actuated for smooth, predictable braking and lower operating costs. Brakes are located at each tandem wheel and have a large total brake surface area to give you dependable stopping power and longer life.



# 120M Motor Grader Features

## Drawbar-Circle-Moldboard (D-C-M)

In addition to performance and durability, we designed the M Series D-C-M so it's quick and easy for you to keep the components tight. Shims and patented top-adjust wear strips are easy to add or replace, dramatically reducing downtime. Durable nylon composite wear inserts maximize circle torque and component life. Sacrificial brass wear strips between the blade mounting group and moldboard can be easily adjusted and replaced. Shimless Moldboard Retention System uses vertical and horizontal adjusting screws to keep moldboard wear strips aligned for reduced blade chatter and precise blade control.

## Responsive Hydraulics

A proven load-sensing system and advanced electro-hydraulics give you superior implement control and responsive hydraulic performance. Proportional Priority Pressure-Compensating valves have different flow rates for the head and rod ends of the cylinder, so you can count on consistent, predictable implement response. Balanced hydraulic flow is proportioned to give you confidence that all implements will operate simultaneously without slowing the engine or speed of some implements.

## Integrated Technologies

- Fully scalable, factory integrated Cat Grade Control Cross Slope helps you more easily maintain desired cross slope by automatically controlling one side of the blade.
- Cat AccuGrade™ uses positioning and guidance technologies, machine sensors, and automatic blade control to help you get to grade faster, easier and more efficiently.
- Cat Product Link™ aids your equipment management with remote monitoring capabilities. A secure VisionLink® user interface lets you know where your equipment is, what it's doing and how it's performing so you can maximize efficiency, improve productivity and lower operating costs.\*

*\*Product Link licensing not available in all areas.  
Please consult your Cat dealer for availability.*

## Safety

Cat M Series Motor Graders are designed with a long list of features to enhance operator safety, as well as the safety of others around the machine. Among the key safety features are:

- Electrical Disconnect Switch that allows the machine to be shut off from ground level.
- Operator Not Present System that keeps the parking brake engaged and hydraulic implements disabled until the operator is seated and the machine is ready for operation.
- Hydraulic Lockout disables all implement functions while still providing machine steering control – especially useful while roading.
- Speed Sensitive Steering becomes less sensitive as ground speed increases for greater operator confidence and control.

**For more details on these and other features, please see your Cat Dealer or visit [www.cat.com](http://www.cat.com).**

# 120M Motor Grader Specifications

## Engine

Engine Model	Cat C6.6 ACERT	
Base Power (1st gear) – Net	103 kW	138 hp
Base Power (1st gear) – Net (Metric)	140 hp	
VHP Plus Range – Net	103-136 kW	138-182 hp
VHP Plus Range – Net (Metric)	140-185 hp	
Displacement	6.6 L	403 in <sup>3</sup>
Bore	105 mm	4.13 in
Stroke	127 mm	5 in
Torque Rise (VHP Plus)	40%	
Maximum Torque (VHP Plus – Net)	906 N·m	668 lb-ft
Speed @ Rated Power	2,000 rpm	
Number of Cylinders	6	
Derating Altitude	3505 m	11,500 ft
Standard – Fan Speed		
Maximum	1,150 rpm	
Minimum	600 rpm	
Standard – Ambient Capability	43° C	109° F
High Ambient – Fan Speed		
Maximum	1,650 rpm	
Minimum	600 rpm	
High Ambient Capability	50° C	122° F

- Maximum torque (VHP Plus) measured at 1,400 rpm.
- Net power is tested per ISO 9249, SAE J1349, and EEC 80/1269 Standards in effect at the time of manufacture.
- Net power advertised is the power available at rated speed of 2,000 rpm, measured at the flywheel when engine is equipped with fan running at minimum speed, air cleaner, muffler and alternator.
- Power as declared per ISO 14396  
Rated Speed = 2,000 rpm  
VHP Plus = 137 kW (183 hp)
- No engine derating required up to 3505 m (11,500 ft).

\* Note: Meets non-current U.S. EPA Tier 3 or EU Stage IIIA emission standards.

## 120M Net Power

Gear	VHP Plus – Net	
Forward		
1st	103 kW	138 hp
2nd	106 kW	143 hp
3rd	110 kW	148 hp
4th	114 kW	153 hp
5th	118 kW	158 hp
6th	121 kW	163 hp
7th	125 kW	168 hp
8th	136 kW	182 hp
Reverse		
1st	103 kW	138 hp
2nd	106 kW	143 hp
3rd–6th	110 kW	148 hp

## Power Train

Forward/Reverse Gears	8 Forward/6 Reverse	
Transmission	Direct drive, power shift, countershaft	
Brakes		
Service	Multiple oil disc	
Service, Surface Area	23 000 cm <sup>2</sup>	3,565 in <sup>2</sup>
Parking	Multiple oil disc	
Secondary	Dual circuit control system	

## Hydraulic System

Circuit Type	Electro-hydraulic load sensing, closed center	
Pump Type	Variable piston	
Pump Output	210 L/min	55.7 gal/min
Maximum System Pressure	24 100 kPa	3,500 psi
Standby Pressure	3100 kPa	450 psi

- Pump output measured at 2,150 rpm.

# 120M Motor Grader Specifications

## Operating Specifications

Top Speed		
Forward	47.5 km/h	29.5 mph
Reverse	37.5 km/h	23.2 mph
Turning Radius, Outside Front Tires	7.34 m	24 ft 1 in
Steering Range – Left/Right	47.5°	
Articulation Angle – Left/Right	20°	
Forward		
1st	4.1 km/h	2.6 mph
2nd	5.6 km/h	3.5 mph
3rd	8.2 km/h	5.1 mph
4th	11.2 km/h	7.0 mph
5th	17.5 km/h	10.8 mph
6th	23.7 km/h	14.8 mph
7th	32.7 km/h	20.3 mph
8th	47.5 km/h	29.5 mph
Reverse		
1st	3.3 km/h	2.0 mph
2nd	6.1 km/h	3.8 mph
3rd	8.9 km/h	5.5 mph
4th	13.8 km/h	8.6 mph
5th	25.8 km/h	16.0 mph
6th	37.5 km/h	23.3 mph

• Speeds when equipped with 14.00-24 tires.

## Service Refill

Fuel Capacity	378 L	100 gal
Cooling System	33 L	8.7 gal
Hydraulic System – Tank	64 L	16.9 gal
Engine Oil	14 L	3.7 gal
Transmission/Differential/ Final Drives	62.5 L	16.5 gal
Tandem Housing (each)	59 L	15.6 gal
Front Wheel Spindle Bearing Housing	0.5 L	0.1 gal
Circle Drive Housing	7 L	1.8 gal

## Frame

Circle		
Diameter	1530 mm	60.2 in
Height	134.5 mm	5.3 in
Blade Beam Thickness	35 mm	1.4 in
Drawbar		
Height	152 mm	6 in
Width	76.2 mm	3 in
Front Frame Structure		
Height	280 mm	11 in
Width	255 mm	10 in
Thickness	22 mm	0.9 in
Front Axle		
Height to Center	596 mm	23.5 in
Wheel Lean, Left/Right	18°	
Total Oscillation per Side	32°	

## Tandems

Height	502 mm	19.76 in
Width	171.7 mm	6.76 in
Sidewall Thickness		
Inner	14 mm	0.5 in
Outer	16 mm	0.6 in
Drive Chain Pitch	44.5 mm	1.8 in
Wheel Axle Spacing	1510 mm	59.5 in
Tandem Oscillation		
Front Up	15°	
Front Down	25°	

## Moldboard

Moldboard		
Width	3.668 m	12 ft
Height	610 mm	24 in
Thickness	22 mm	0.87 in
Arc Radius	413 mm	16.3 in
Throat Clearance	134 mm	5.2 in
Cutting Edge		
Width	152 mm	6 in
Thickness	16 mm	0.6 in
End Bit		
Width	152 mm	6 in
Thickness	16 mm	0.6 in
Blade Pull		
Base GVW	9785 kg	21,571 lb
Maximum GVW	12 223 kg	26,948 lb
Down Pressure		
Base GVW	6291 kg	13,869 lb
Maximum GVW	11 622 kg	25,623 lb

• Blade pull calculated at 0.9 traction coefficient, which is equal to ideal no-slip conditions, and Gross Machine Weight.

# 120M Motor Grader Specifications

## Blade Range

Circle Centershift		
Right	656 mm	25.8 in
Left	656 mm	25.8 in
Moldboard Sideshift		
Right	660 mm	26 in
Left	510 mm	20.1 in
Maximum Blade Position Angle	90°	
Blade Tip Range		
Forward	40°	
Backward	5°	
Maximum Shoulder Reach Outside of Tires		
Right	1905 mm	75 in
Left	1742 mm	68.6 in
Maximum Lift Above Ground	427 mm	16.8 in
Maximum Depth of Cut	720 mm	28.3 in

## Ripper

Ripping Depth, Maximum	428 mm	17 in
Ripper Shank Holders	5	
Ripper Shank Holder Spacing	533 mm	21 in
Penetration Force*	8031 kg	17,705 lb
Pryout Force*	11 931 kg	26,303 lb
Machine Length Increase, Beam Raised	995 mm	39.2 in

\* Based on typically equipped weight.

## Scarifier

Front, V-Type, 5 or 11 Tooth		
Working Width	1205 mm	47.4 in
Scarifying Depth, Maximum	467 mm	18.4 in
Scarifier Shank Holders	5/11	
Scarifier Shank Holder Spacing	116 mm	4.6 in
Mid, V-Type		
Working Width	1184 mm	46.6 in
Scarifying Depth, Maximum	292 mm	11.5 in
Scarifier Shank Holders	11	
Scarifier Shank Holder Spacing	116 mm	4.6 in
Mid, Straight		
Working Width	1800 mm	71 in
Scarifying Depth, Maximum	317 mm	12.5 in
Scarifier Shank Holders	17	
Scarifier Shank Holder Spacing	111 mm	4.4 in

## Weights

Gross Vehicle Weight – Base		
Total	14 493 kg	31,950 lb
Front Axle	3621 kg	7,982 lb
Rear Axle	10 872 kg	23,968 lb
Gross Vehicle Weight – Maximum		
Total	20 271 kg	44,690 lb
Front Axle	6689 kg	14,748 lb
Rear Axle	13 582 kg	29,942 lb
Gross Vehicle Weight – Typically Equipped		
Total	16 876 kg	37,204 lb
Front Axle	4524 kg	9,974 lb
Rear Axle	16 876 kg	27,230 lb

- Base operating weight calculated on standard machine configuration with 14.00 24 12PR (G-4) tires, full fuel tank, coolant, lubricants and operator.

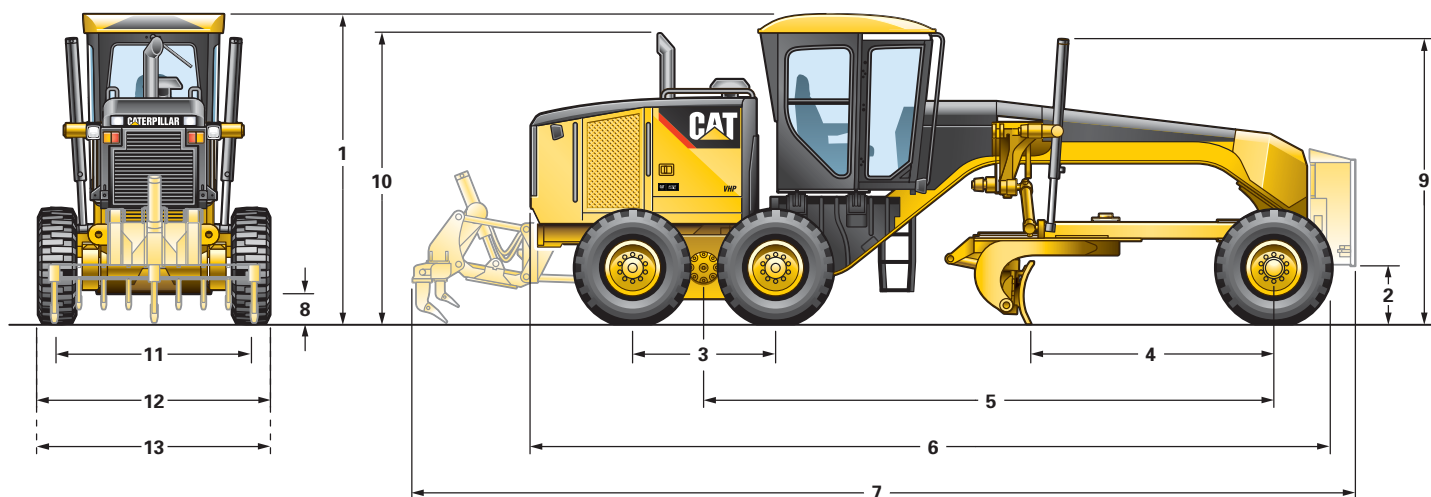
## Standards

ROPS/FOPS	ISO 3471:1994/ ISO 3449:1992
Steering	ISO 5010:2007
Brakes	ISO 3450:1996
Sound	ISO 6394:2008/ ISO 6395:2008

- The static operator sound pressure level is 74 dB(A) when “ISO 6394:2008” is used to measure the value for an enclosed cab. The measurement was conducted with the cab doors and the cab windows closed. The cab was properly installed and maintained.
- The dynamic spectator sound pressure level is 105 dB(A) for 120M when “ISO 6395:2008” is used to measure the value for an enclosed cab. The measurement was conducted at 70% of the maximum engine cooling fan speed.

# 120M Motor Grader Specifications

## Dimensions



<b>1</b>	Height – Top of Cab	3308 mm	130.2 in
	Height – Top of Cab Product Link (cellular)	3378 mm	133.0 in
<b>2</b>	Height – Front Axle Center	596 mm	23.5 in
<b>3</b>	Length – Between Tandem Axles	1511 mm	59.5 in
<b>4</b>	Length – Front Axle to Moldboard	2450 mm	96.4 in
<b>5</b>	Length – Front Axle to Mid Tandem	5915 mm	232.9 in
<b>6</b>	Length – Front Tire to Rear of Machine	8436 mm	332.1 in
<b>7</b>	Length – Push Plate to Ripper	9930 mm	390.9 in
	Length – Push Plate to Ripper Retracted	9612 mm	378.4 in
<b>8</b>	Ground Clearance at Rear Axle	348 mm	13.7 in
<b>9</b>	Height to Top of Cylinders	2924 mm	115.1 in
<b>10</b>	Height to Exhaust Stack	2885 mm	113.6 in
<b>11</b>	Width – Tire Center Lines	2120 mm	83.5 in
<b>12</b>	Width – Outside Rear Tires	2491 mm	98.1 in
<b>13</b>	Width – Outside Front Tires	2511 mm	98.9 in

All dimensions are approximate, based on standard machine configuration with 14R24 tires.

## Optional Tire Arrangements

120M		
Rim Size	Wheel Group	Tires
9 × 24	Single-Piece	13.00-24
9 × 24	Single-Piece	14.0R24
13 × 25	Single-Piece	17.5R25
10 × 24	Multi-Piece	14.00-24
10 × 24	Multi-Piece	14.0R24
14 × 25	Multi-Piece	17.5R25

Note: Consult your dealer for individual tire width, size, and brand.



## Standard Equipment

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

### POWER TRAIN

- Air cleaner, dual stage, dry type, diesel, with automatic engine derate and automatic dust ejector, service indicator through Cat Messenger
- Air-to-air after cooler (ATAAC)
- Belt, serpentine, automatic tensioner
- Brakes, oil disc, four-wheel, hydraulic
- Demand fan, hydraulic
- Differential Lock/Unlock, Automatic
- Drain, engine oil, ecology
- Electronic over speed protection
- Engine Cat C6.6 with ACERT Technology, diesel, with automatic engine derate and idle control  
Note: Engines meet non-current U.S. EPA Tier 3 or EU Stage IIIA emission standards.
- Fuel tank, 341 L (90 gal), ground level access and sediment drain
- Muffler, underhood
- Parking brake – multi-disc, sealed, oil-cooled
- Priming pump, fuel
- Rear axle, modular
- Sediment drain, fuel tank
- Tandem drive
- Transmission, 8F/6R, power shift, direct drive
- VHP Plus (Variable Horsepower Plus)

### ELECTRICAL

- Alarm, back up
- Alternator, 80 ampere, sealed
- Batteries, maintenance free, heavy duty, 1,125 CCA
- Breaker panel, ground accessible
- Cab harness and electrical hydraulic valves
- Electrical system, 24V
- Grade Control Ready – Cab harness, software, electrical hydraulic valves, bosses and brackets
- Lights, roof-mounted roading, reversing, LED stop and tail
- Product Link
- Starter, electric

### OPERATOR ENVIRONMENT

- Accelerator
- Air conditioning with heater
- Arm and wrist rest, electronically adjustable
- Articulation, automatic Return-to-Center
- Cat Messenger operator information system
- Centershift pin indicator
- Coat hook
- Cup holder
- Display, digital speed and gear
- Doors, left and right side with wiper
- Gauge, machine level
- Gauge cluster (analog) – fuel, articulation, engine coolant temp, engine RPM, hydraulic oil temp
- Hour meter, digital
- Joystick hydraulic controls right/left blade lift with float position, circle drive, blade sideshift and tip, centershift, front wheel lean, articulation and steering
- Joystick, adjustable armrests
- Joystick gear selection

- Joystick hydraulic power steering
- Ladders, cab, left and right side
- Lights, night time cab
- Mirror, inside rearview, wide angle
- Power port, 12V
- Radio Ready, Entertainment
- ROPS cab, sound suppressed
- Seat, cloth-covered, comfort suspension
- Seat belt, retractable 76 mm (3 in)
- Storage area for cooler/lunchbox
- Throttle control, electronic
- Windows, laminated glass:
  - fixed front with intermittent wiper
  - side and rear (3)

### FLUIDS

- Antifreeze
- Extended Life Coolant to –35° C (–30° F)

### TIRES, RIMS AND WHEELS

- Partial allowance for tires on 229 × 607 mm (9 × 24 in) single-piece rims is included in the base machine price and weight

### OTHER STANDARD EQUIPMENT

- Accumulators, brake, dual certified
- Anti-glare paint
- Bumper, rear, integrated with hitch
- CD ROM Parts Book
- Clutch, circle drive slip
- Cutting edges
  - 152 × 16 mm (6 × 5/8 in)
  - curved DH-2 steel
  - 19 mm (3/4 in) mounting bolts
- Doors (3), engine compartment, locking
- Drawbar – 4 shoes, replaceable wear strips
- Electrical hydraulic valves, hydraulic lines for base 8 functions
- Endbits
  - 16 mm (5/8 in) DH-2 steel
  - 19 mm (3/4 in) mounting bolts
- Fluid check, ground level
- Frame, articulated, with safety lock
- Ground level engine shutdown
- Ground level fueling
- Hammer (emergency exit)
- Horn, electric
- Hydraulic lines for base functions
- Lockout, hydraulic implement (for roading and servicing)
- Moldboard – 3658 × 610 × 22 mm (12 ft × 24 in × 7/8 in)
- Mounting, cab roof accessories
- Pump, hydraulic, high capacity, 98 cm<sup>3</sup> (6 in<sup>3</sup>)
- Radiator, cleanout access
- Secondary steering
- Serviceability, left-hand side
- S•O•S<sup>SM</sup> ports: engine, hydraulic, transmission, coolant, fuel
- Tandem walkway/guards
- Tool box
- Tow hitch

# 120M Motor Grader

## Optional Equipment

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

	kg	lb
<b>ELECTRICAL</b>		
Alternator, 150 ampere	2	5
<b>Batteries:</b>		
extreme duty, 1,400 CCA	14	30
Converter, communication (CB)	5	11
<b>Lights:</b>		
Headlights, high	5	11
Headlights, low	5	11
Working lights, basic	9	20
Working lights, plus	10	22
Warning: beacon or strobe	2	5
Mounting for warning light	5	11
<b>GUARDS</b>		
Articulation guard	13	30
Axle hose guard	7	15
Fenders, front	56	123
Fenders, rear	74	163
Sound guard (bottom)	110	243
Transmission guard	141	311
<b>OPERATOR ENVIRONMENT</b>		
Deluxe CD radio with MP3 and Bluetooth technology		
Fan, defroster, rear window	2	4
<b>Mirrors, outside:</b>		
heated 24V	15	33
mounted	15	33

	kg	lb
Precleaner, HVAC	5	10
Radio ready, AM/FM	9	20
Seat, air suspension, cloth	2	5
Shade, sun	2	5
Wiper/washer, rear	2	4
<b>POWER TRAIN</b>		
Precleaner, snow/debris	2	4.4
Transmission, autoshift	2	5
<b>OTHER ATTACHMENTS</b>		
AccuGrade ARO	39	85
Accumulators, blade lift	77	170
Camera, rearview	9	20
Cat Grade Control Cross Slope	75	165
Cat Product Link 321 (Satellite)	13	29
Cat Product Link 522 (Cellular)	13	29
Compressor/tank, air	27	50
<b>Heater, engine coolant:</b>		
120V	1	3
240V	1	3
Hydraulic arrangements with one or more additional hydraulic valves are available for ripper, dozer, snow wings, front lift group, mid-mount scarifier.		
Security system	5	11
Snow wing mounting, frame ready	111	245

	kg	lb
Sound suppression	15	33
Starting aid, ether	0.5	1
<b>WORK TOOLS/ GROUND ENGAGING TOOLS</b>		
Blade extension, left hand, 610 mm (2 ft)	113	249
Endbits, overlay	24	52
Front lift group, mounting	5	11
Front lift group	680	1,500
Mid-Mount Scarifier, Package	942	2,077
Mid-Mount Scarifier, Mounting	57	125
<b>Moldboard</b>		
4267 × 610 × 22 mm (14 ft × 24 in × 7/8 in)	100	220
4267 × 686 × 25 mm (14 ft × 27 in × 1 in)	257	567
Push plate	885	1,950
Ripper, mounting	32	70
Ripper, rear	962	2,120
Ripper tooth	28	61
Scarifier, front	434	956

## MACHINE ARRANGEMENTS

Snow Arrangement

Materials and specifications are subject to change without notice.

Featured machines in photos may include additional equipment.

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

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