

# 12M3 AWD

## Motor Grader



**M Series 3 graders bring the latest emissions reduction technology to the most durable, productive and comfortable motor graders on the market. From building roads to maintaining them, M Series Motor Graders are designed to help you get more work done in less time. Outstanding durability, unprecedented operator comfort and ease of service help to maximize your return on investment. M Series 3 Motor Graders meet Japan 2014 (Tier 4 Final) emission standards.**

### Machine 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 can be adjusted electronically, making it easy to set your ideal operating position.

Adding to ease of operation are features like Articulation Return to Center, which automatically returns the machine to a straight frame position with the touch of a button. Electronic Throttle Control provides the best match of horsepower and torque for the demands of the application. Selectable Blade Lift Modes allow you to choose Fine, Normal or Coarse blade lift modes to best fit your application or operating style.

### Operator Station

In addition to excellent comfort and visibility, M Series 3 graders feature an updated seat with heated/ventilated options, as well as an optional seat belt indicator. The high capacity Heating, Ventilation and Air Conditioning (HVAC) system dehumidifies and pressurizes the cab, seals out dust and helps keep windows clear. An updated message display shows machine and diagnostic information. A center console mounted messenger display shows machine and diagnostic information. Cat® Grade Control Cross Slope readings are conveniently displayed in front of the operator. An optional deluxe radio with CD features MP3 and Bluetooth technology.

### Emissions Technology

Emissions reduction technology on the M Series 3 Motor Grader is designed to be transparent, with no action required from the operator. There is no need to stop. Regeneration runs automatically at cold start-up and, if needed, in the background while you work. The Selective Catalytic Reduction system utilizes Diesel Exhaust Fluid (DEF), which can be conveniently filled from ground level. Simply refill the DEF tank when you refuel. A gauge on the dash shows your fluid level.



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# 12M3 AWD Motor Grader Features

## Engine and Power Train

A Cat C9.3 ACERT™ engine gives you the performance to maintain consistent grading speeds for maximum productivity. Programmable Autoshift simplifies operation by allowing you to program the transmission to shift at optimal points to match your application. A new standard Economy Mode can be turned on to help you save fuel by reducing engine speed so the machine works in a more efficient range. The average fuel savings is up to 10%, depending on the application.

Standard Automatic Differential Lock/Unlock monitors machine and application parameters to unlock/re-lock the differential during operation, improving production and enhancing comfort while protecting the power train. A hydraulic demand fan automatically adjusts speed according to cooling needs, so when cooling demand is reduced, you benefit from more power to the ground and improved fuel efficiency.

## All Wheel Drive

All Wheel Drive (AWD) gives you the additional power to the ground you need to work more efficiently in mud, gravel, sand or snow. The added traction helps reduce sliding on side slopes.

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

The drawbar, circle and moldboard are designed to make it easy to keep the components tight. One person can easily adjust or replace the patented top-adjust drawbar wear inserts from the top of the drawbar plate, 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. The 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 optional Cat Grade Control Cross Slope helps you more easily maintain desired cross slope by automatically controlling one side of the blade.
- Optional 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 and lower operating costs.
- Optional Cat Advanced Control Joysticks (ACJs) allow you to control automated grading solutions efficiently and safely without removing your hands from the joysticks.

## Safety

Some of the many safety features designed into the M Series 3 Motor Grader include:

- Ground-level Electrical Disconnect switch and Engine Shutoff switch.
- Operator Presence System keeps the parking brake engaged and hydraulic implements disabled until the operator is seated and machine is ready for operation.
- Hydraulic Lockout disables all implement functions while still providing machine steering control – especially useful while roading.
- Speed Sensitive Steering is a standard feature for greater operator confidence and control.
- Rearview camera with in-cab monitor.

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

# 12M3 AWD Motor Grader Specifications

## Engine

Engine Model	Cat C9.3 ACERT	
Emissions	Japan 2014 (Tier 4 Final)	
Base Power (1st gear) – Net	141 kW	
AWD Range – Net	141-188 kW	
Displacement	9.3 L	
Bore	115 mm	
Stroke	149 mm	
Torque Rise	38%	
Maximum Torque (VHP Plus)	1138 N·m	
Maximum Torque (AWD On)	1247 N·m	
Speed @ Rated Power	2,000 rpm	
Number of Cylinders	6	
Derating Altitude	3050 m	
High Ambient – Fan Speed		
Standard	1,400 rpm	
Maximum	1,550 rpm	
Minimum	500 rpm	
Standard Capability	43° C	
High Ambient Capability	50° C	
Gear – Net Power	<b>AWD Off</b>	<b>AWD On</b>
Forward		
1st	141 kW	149 kW
2nd	149 kW	164 kW
3rd	156 kW	168 kW
4th	160 kW	172 kW
5th	164 kW	188 kW
6th	168 kW	188 kW
7th	172 kW	188 kW
8th	172 kW	188 kW
Reverse		
1st	133 kW	133 kW
2nd	141 kW	141 kW
3rd–6th	149 kW	149 kW

- Net power is tested per ISO 9249, SAE J1349, and EEC 80/1269 Standards in effect at the time of manufacture.
- VHP Plus is standard for the 12M3 AWD.
- 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.
- No engine derating required up to 3050 m.
- Power as declared per ISO 14396  
Rated rpm 2,000  
VHP+ = 175 kW  
AWD = 190 kW
- All nonroad Japan 2014 (Tier 4 Final) emission standards diesel engines are required to use only Ultra Low Sulfur Diesel (ULSD) fuels containing 15 ppm (mg/kg) sulfur or less.
- Cat engines equipped with a Selective Catalytic Reduction (SCR) system are required to use:
  - Diesel Exhaust Fluid (DEF) which meets the requirements outlined in the International Organization for Standardization (ISO) standard 22241-1.

## Power Train

Forward/Reverse Gears	8 Forward/6 Reverse
Transmission	APECS, Direct Drive, Powershift
Brakes	
Service	Multiple Oil Disc
Service, Surface Area	23 000 cm <sup>2</sup>
Parking	Multiple Oil Disc
Secondary	Dual Circuit

## Hydraulic System

Circuit Type	Parallel
Pump Type	Variable Piston
Pump Output	210 L/min
Maximum System Pressure	24 150 kPa
Reservoir Tank Capacity	64 L
Standby Pressure	6100 kPa

- Pump output measured at 2,150 rpm.

## Operating Specifications

Top Speed	
Forward	46.6 km/h
Reverse	36.8 km/h
Turning Radius, Outside Front Tires	7.8 m
Steering Range – Left/Right	50°
Articulation Angle – Left/Right	20°
Forward	
1st	4.1 km/h
2nd	5.5 km/h
3rd	8.0 km/h
4th	11.0 km/h
5th	17.1 km/h
6th	23.3 km/h
7th	32.0 km/h
8th	46.6 km/h
Reverse	
1st	3.2 km/h
2nd	6.0 km/h
3rd	8.7 km/h
4th	13.5 km/h
5th	25.3 km/h
6th	36.8 km/h

- Calculated with no slip and 14.0R24 tires.

# 12M3 AWD Motor Grader Specifications

## Service Refill

Fuel Capacity	394 L
Cooling System	57 L
Hydraulic System	
Total	100 L
Tank	64 L
Engine Oil	30 L
Transmission/Differential/Final Drives	70 L
Tandem Housing (Each)	76 L
Front Wheel Spindle Bearing Housing	0.5 L
Circle Drive Housing	7 L
Diesel Exhaust Fluid	22 L

## Frame

Circle	
Diameter	1530 mm
Height	140 mm
Blade Beam Thickness	40 mm
Drawbar	
Height	150 mm
Width	76 mm
Thickness	12.5 mm
Front-Top/Bottom Plate	
Width	305 mm
Thickness	22 mm
Front Frame Structure	
Height	320 mm
Width	305 mm
Front Axle	
Height to Center	595 mm
Wheel Lean, Left/Right	18°
Total Oscillation per Side	32°

## Tandems

Height	505 mm
Width	200 mm
Sidewall Thickness	
Inner	16 mm
Outer	18 mm
Drive Chain Pitch	51 mm
Wheel Axle Spacing	1525 mm
Tandem Oscillation	
Front Up	15°
Front Down	25°

## Tire Arrangement

### Tire Option for M Series 3 Motor Graders

#### 12M3 AWD

Rim Size	Wheel Group	Tires
10 × 24	Multi-Piece	14.0R24

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

## Moldboard

Blade Width	3.7 m	4.3 m Plus
Moldboard		
Height	610 mm	685 mm
Thickness	22 mm	25 mm
Arc Radius	415 mm	415 mm
Throat Clearance	165 mm	165 mm
Cutting Edge		
Width	150 mm	150 mm
Thickness	16 mm	16 mm
End Bit		
Width	150 mm	150 mm
Thickness	16 mm	16 mm
Blade Pull		
Snow Configuration GVW	16 450 kg	16 700 kg
Construction Configuration GVW	17 370 kg	—
Maximum GVW	22 510 kg	22 510 kg

# 12M3 AWD Motor Grader Specifications

## Blade Range

Blade Width	3.7 m	4.3 m Plus
Circle Centershift		
Right	730 mm	730 mm
Left	695 mm	695 mm
Moldboard Sideshift		
Right	660 mm	660 mm
Left	510 mm	510 mm
Maximum Blade Position Angle	90°	90°
Blade Tip Range		
Forward	40°	40°
Backward	5°	5°
Maximum Shoulder Reach Outside of Tires		
Right	1980 mm	2280 mm
Left	1790 mm	2090 mm
Maximum Lift Above Ground	480 mm	480 mm
Maximum Depth of Cut	715 mm	715 mm

## Ripper

Ripping Depth, Maximum	425 mm
Ripper Shank Holders	5
Ripper Shank Holder Spacing	535 mm
Penetration Force	9440 kg
Pryout Force	12 605 kg
Machine Length Increase, Beam Raised	1030 mm

## Scarifier

Front, V-Type: Working Width	1205 mm
Front, V-Type, 5 or 11 Tooth	
Working Width	1030 mm
Scarifying Depth, Maximum	465 mm
Scarifier Shank Holders	11
Scarifier Shank Holder Spacing	115 mm
Mid, V-Type	
Working Width	1185 mm
Scarifying Depth, Maximum	290 mm
Scarifier Shank Holders	11
Scarifier Shank Holder Spacing	115 mm
Rear	
Working Width	2135 mm
Scarifying Depth, Maximum	425 mm
Scarifier Shank Holders	9
Scarifier Shank Holder Spacing	265 mm

## Weights – AWD

MLIT Snow Removal Configuration (Blade)	3.7 m	4.3 m Plus
Total	18 275 kg	18 555 kg
Front Axle	4710 kg	4870 kg
Rear Axle	13 565 kg	13 685 kg
MLIT Construction Configuration (Blade)	3.7 m	
Total	19 300 kg	
Front Axle	5645 kg	
Rear Axle	13 655 kg	
Gross Vehicle Weight, Maximum (Blade)	3.7 m	4.3 m Plus
Total	25 015 kg	25 015 kg
Front Axle	7745 kg	7745 kg
Rear Axle	17 270 kg	17 270 kg

- Base operating weight on standard machine configuration is calculated with full fuel tank, coolant, lubricants, operator and 14.0R24 tires with multi-piece (MP) rims.

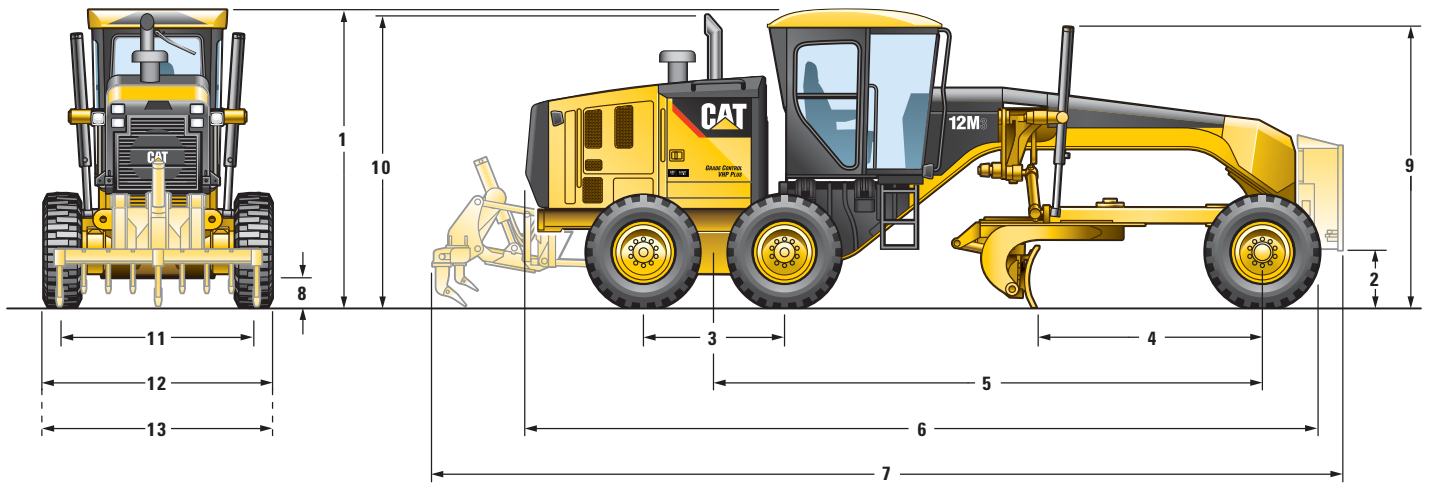
## Standards

ROPS/FOPS	ISO 3471/ISO 3499
Steering	ISO 5010
Brakes	ISO 3450
Sound	ISO 6394; ISO 6395

- The declared dynamic operator sound pressure level is 71 dB(A) for the 12M Series 3 AWD when “ISO 6396:2008” is used to measure the value for a European Union “CE” marked machine. The measurement was conducted at 70% of the maximum engine cooling fan speed. The sound level may vary at different engine cooling fan speeds.
- The declared exterior sound power level is 107 dB(A) for the 12M Series 3 AWD when the value is measured according to the dynamic test procedures and the conditions that are specified in “ISO 6395:2008.” The measurement was conducted for a European Union “CE” marked machine at 70% of the maximum engine cooling fan speed. The sound level may vary at different engine cooling fan speeds and during diesel particulate filter regeneration.

# 12M3 AWD Motor Grader Specifications

## Dimensions



<b>1</b> Height – Top of Cab	3310 mm	<b>8</b> Ground Clearance at Rear Axle	340 mm
<b>2</b> Height – Front Axle Center	595 mm	<b>9</b> Height to Top of Cylinders	3040 mm
<b>3</b> Length – Between Tandem Axles	1525 mm	<b>10</b> Height to Exhaust Stack	3255 mm
<b>4</b> Length – Front Axle to Moldboard	2550 mm	<b>11</b> Width – Tire Center Lines	2140 mm
<b>5</b> Length – Front Axle to Mid Tandem	6125 mm	<b>12</b> Width – Outside Rear Tires	2510 mm
<b>6</b> Length – Front Tire to Rear of Machine	8910 mm	<b>13</b> Width – Outside Front Tires	2595 mm
<b>7</b> Length – Counterweight to Ripper	10 135 mm		

• Calculated with 14.0R24 Tires.

# 12M3 AWD Motor Grader Standard Equipment

## 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 the integrated Message Display
- Air-to-air after cooler (ATAAC)
- Belt, serpentine, automatic tensioner
- Brakes, oil disc, four-wheel, hydraulic
- Demand fan, hydraulic, swing-out
- Diesel exhaust fluid tank, 22 L ground level access, and sediment drain
- Differential Lock/Unlock, Automatic
- Drain, engine oil, ecology
- Economy mode
- Electronic over speed protection
- Engine, C9.3 with ACERT Technology, Japan 2014 (Tier 4 Final) emission standards
- Fuel tank, 394 L, ground level access and sediment drain
- Fuel-water separator
- Muffler, under hood
- Parking brake – multi-disc, sealed, oil-cooled
- Priming pump, fuel
- Rear axle, modular
- Sediment drain, fuel tank
- Tandem drive
- Transmission, 8F/6R, powershift, direct drive, Advanced Productivity Electronic Control Strategy (APECS)

### ELECTRICAL

- Alarm, back up
- Alternator, 250A, 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
- Integrated Message Display operator information system
- Centershift pin indicator
- Coat hook
- Cup holder
- Display, digital speed and gear
- Doors, left and right side with wiper
- Gauge cluster (analog) – fuel, articulation, engine coolant temp, engine RPM, hydraulic oil temp, regen, DEF
- 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 power 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
- Mirror, outside
- Power port, 12V
- Radio Ready, Entertainment
- ROPS cab, sound suppressed 70 dB(A)
- Seat, cloth-covered, comfort suspension
- Seat belt, retractable 76 mm
- Storage area for cooler/lunchbox
- Throttle control, electronic
- Windows, laminated glass:
  - fixed front with intermittent wiper
  - door with intermittent wipers (3)
- Windows: tempered
  - left and right side wipers
  - rear and intermittent wiper

### FLUIDS

- Antifreeze
- Extended Life Coolant to –35° C

### OTHER STANDARD EQUIPMENT

- Accumulators, brake, dual certified
- Anti-glare paint
- Bumper, rear, integrated with hitch
- Camera, rearview
- CD ROM Parts Book
- Clutch, circle drive slip
- Cutting edges
  - 150 × 15 mm
  - curved DH-2 steel
  - 20 mm mounting bolts
- Doors (4), engine compartment, locking
- Drawbar – 6 shoes, replaceable wear strips
- Electrical hydraulic valves, hydraulic lines for base 8 functions
- Endbits
  - 15 mm DH-2 steel
  - 20 mm 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 – 3660 × 610 × 22 mm
- Mounting, cab roof accessories
- Pump, hydraulic, high capacity, 98 cm<sup>3</sup>
- Radiator, cleanout access (both sides with swing doors)
- Secondary steering
- Serviceability, LH side
- S·O·S<sup>SM</sup> ports: engine, hydraulic, transmission, coolant, fuel
- Tandem walkway/guards
- Tool box

# 12M3 AWD Motor Grader

## Optional Equipment

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

### ELECTRICAL

- Batteries:
  - maintenance free, extreme duty 1,400 CCA
- Lights:
  - Headlights, low
  - Working lights, basic
  - Working lights, plus
  - Warning: beacon or strobe
  - Mounting for warning light

### FLUIDS

- Extended Life Coolant to  $-51^{\circ}\text{C}$

### GUARDS

- Articulation guard
- Fenders, front, AWD
- Fenders, rear
- Front axle guard
- Sound suppression (bottom)
- Sound suppression (enclosure)
- Transmission

### OPERATOR ENVIRONMENT

- Mirrors, outside:
  - heated 24V
  - mounted
- Comfort Plus Arrangement
- Comfort Premium Arrangement

### POWER TRAIN

- Precleaner, snow
- Starter, extreme duty, 1,000 ampere

### OTHER ATTACHMENTS

- AccuGrade ARO
- Integrated cross slope
- Accumulators, blade lift
- Drain, ecology, engine Wiggins
- Heater, engine coolant:
  - 120V
  - 240V
- Hydraulic arrangements with one or more additional hydraulic valves are available for rear ripper, dozer and snow plow
- Starting aid, ether

### WORK TOOLS/G.E.T.

- Blade extension, left hand, 610 mm
- Blade extension, right hand, 610 mm
- Counterweight
- Cutting edges, curved
- Endbits, overlay
- Front lift group, mounting
- Front lift group, mechanical
- Grader bit, narrow and super penetration
- Mid-Mount Scarifier, Package
- Moldboard
  - 4265 mm  $\times$  610 mm  $\times$  20 mm
  - 4265 mm  $\times$  685 mm  $\times$  25 mm
- Push plate
- Ripper, rear
- Ripper tooth
- Scarifier, front
- Tow hitch

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)

AEHQ7645 (08-2015)  
(Japan)

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Based on the Labor, Safety and Health Laws in Japan, employer of small construction equipment are required to provide specific training for all operators on machines with ship weight less than 3 metric ton. For machines greater than 3 metric ton, operator needs to obtain operator license certification from a Government approved registered training school.

