

# 14M Motor Grader Preliminary



## Operator Station

A technologically advanced cab, featuring joystick controls, provides unmatched comfort, visibility, reduced vibration and sound levels.

## Steering and Implement Controls

Two joysticks offer precise control and unparalleled ease of operation. This advanced technology makes the 14M the most operator-friendly motor grader.

## Drawbar, Circle, Moldboard

Top-accessible drawbar wear inserts and a shimless moldboard retention system make DCM adjustment fast and simple, delivering precise material control while lowering operating costs.

## Structures

A formed front frame and box-section articulation hitch with a large tapered roller bearing provide outstanding durability and stability.

## Engine

The Cat® C11 engine combines power management with ACERT™ Technology to deliver maximum power and efficiency in every gear while reducing the environmental impact.

## Power Train

An electronically controlled power shift transmission assures smooth gear transitions while maximizing power to the ground. Modular rear axle and hydraulic brakes simplify serviceability and reduce operating costs.

## Hydraulics

The Electro-Hydraulic load-sensing system provides the foundation for advanced machine controls, enabling superior controllability, precision and predictable hydraulic movements, with the reliability you expect from Caterpillar®.



## Integrated Electronic Solutions

Full systems integration with advanced electronics including Cat Messenger, AccuGrade™, and Cat ET, create a “Smart Machine” that optimizes performance and availability.

## Work Tools and Attachments

The Work Tools and optional attachments for the 14M promote additional machine versatility, utilization and performance.

## Serviceability and Customer Support

Fast component replacement and minimum downtime are possible with Caterpillar’s exceptional parts availability and dealers’ advanced rebuild and repair capabilities.

## Operator Station

*The 14M features a revolutionary cab design that provides unmatched comfort, visibility and ease of use, making the operator more confident and productive.*



### **Advanced Joystick Controls.**

Two electro-hydraulic joysticks reduce hand and wrist movement as much as 78% compared to conventional lever controls for greatly enhanced operator efficiency. The intuitive pattern is easy to learn, and provides the precise implement control you expect from Caterpillar.

### **Auxiliary Pod and Ripper Control.**

The ripper control and auxiliary control pod are ergonomically positioned to allow simple, comfortable operation for the multiple hydraulic options on the 14M.

**Visibility.** The 14M boasts excellent visibility to the work area, made possible with angled cab doors, a tapered engine enclosure and a patented sloped rear window. Flat black anti-glare material on the front frame and rear enclosure reduces glare for the operator, resulting in safer operation at night or in snow.

**Cat Comfort Series Seat.** The Cat Comfort Series suspension seat has an ergonomic high-back design, with extra thick contoured cushions and infinitely adjustable lumbar support that evenly distributes the operator's weight. Multiple seat controls and armrests are easy to adjust for optimal support and comfort all day. The optional air suspension seat enhances ride quality for additional comfort.

### **In-Dash Instrument Cluster.**

The instrument panel, with easy-to-read, high-visibility gauges and warning lamps, keeps the operator aware of critical system information.

**Cat Messenger.** Cat Messenger provides real-time machine performance and diagnostic data. The operator can quickly view critical performance and operating information, in multiple languages, helping to maximize the life and productivity of the machine.

**Controls and Switches.** Reliable, long-life rocker switches are located on the right side cab post within easy reach for the operator.

**Comfort and Convenience.** Caterpillar® has built the most comfortable cab in the industry by removing the control levers and steering wheel, and using a deeper cab design to give more leg room.

**Optional HVAC.** The optional heating, ventilation and air conditioning system is fully integrated into the design of the cab. Intelligent placement of vents provides consistent climate control and clear windows for every condition. The high-capacity system dehumidifies air and pressurizes the cab, circulating fresh air and sealing out dust. An easily accessible fresh air filter is located outside the cab at ground level for quick replacement or cleaning.

**Optional HVAC Precleaner.** Increases the service interval of the HVAC fresh air filter by up to ten times.

### **Low Interior Sound and Vibration Levels.**

Isolation mounts for the cab, engine and transmission, in addition to the relocation of the hydraulic pump and valves, provide significant sound and vibration reductions. Interior sound levels are 72 dB(A) using ISO 6394 at 70% fan speed. The quiet interior with low vibration levels provides a comfortable work environment.

**Additional Cab Features.** Multiple optional features are available with the 14M cab, including: rear camera, Hi-Intensity Discharge (HID) lighting, satellite radio and multiple power outlets.

# Steering and Implement Controls

*The 14M sets the new standard for motor grader operational efficiency.*

**Ease of Operation.** The revolutionary joystick controls make the 14M easier to operate without sacrificing control. The intuitive control pattern allows both new and experienced operators to become productive quickly. With as much as a 78% reduction in hand and wrist movement, compared to traditional levers, you will remain comfortable throughout the day.

**Intuitive Steering Control.** The 14M introduces a breakthrough in joystick steering control. This technology creates a one-to-one relationship between the lean angle of the joystick and the turning angle of the steer tires. It automatically adjusts steering sensitivity at higher ground speeds for comfortable and predicible control.

**Secondary Steering System.** The standard secondary steering system automatically engages an electric hydraulic pump in case of a drop in steering pressure, allowing the operator to steer the machine to a stop.

**Electronic Throttle Control.** Electronic Throttle Control (ETC) provides easy, precise, and consistent throttle operation. An automatic and manual mode on a single switch offers flexibility for different applications and operator preference.

**Left Joystick Functions.** The left joystick primarily controls the machine direction and speed.

- 1 – Steering: Lean joystick left and right
- 2 – Articulation: Twist joystick left and right
- 3 – Articulation Return to Center: Yellow thumb button
- 4 – Wheel Lean: Two black thumb buttons
- 5 – Direction: Index trigger shifts transmission to forward, neutral or reverse
- 6 – Gear Selection: Two yellow thumb buttons upshift and downshift
- 7 – Left moldboard lift cylinder: Push joystick to lower, pull joystick to raise
  - Left moldboard lift cylinder float: Pushing joystick through detent engages float

### **Articulation Return-to-Center.**

This exclusive feature automatically returns the machine to a straight frame position from any articulation angle with the touch of a single button. Return-to-Center helps improve productivity and safety by allowing the operator to focus on controlling the moldboard.

**Right Joystick Function.** The right joystick primarily controls the Drawbar, Circle and Moldboard functions.

- 1 – Right moldboard lift cylinder: Push joystick to lower, pull joystick to raise
  - Right moldboard lift cylinder float: Pushing joystick through detent engages float
- 2 – Moldboard slide: Lean joystick left and right
- 3 – Circle turn: Twist joystick left and right
- 4 – Moldboard tip: Thumb switch fore and aft
- 5 – Drawbar center shift: Thumb switch left and right
- 6 – Electronic Throttle Control: Top trigger button is resume and decrement
- 7 – Differential Lock/Unlock: Bottom trigger button

**Ripper Control.** Infinitely variable roller switches control the rear ripper and/or front lift group (when equipped), for easy and comfortable control.

### **Programmable Auxiliary Hydraulic Pod.**

Four fingertip controls and a mini joystick maximize hydraulic control flexibility, accommodating up to six hydraulic circuits. Individual functions are easily programmable to meet any desired hydraulic configuration.

## Drawbar, Circle, Moldboard

*Designed for precise blade control, durability and maximum productivity.*

### **Top-Adjust Drawbar Wear Strips.**

The top-adjust wear strips dramatically reduce circle adjustment time.

By removing the access plates on top of the drawbar, shims and wear strips can easily be added or replaced, cutting service downtime and lowering the overall machine operating costs.

### **Shimless Moldboard Retention System.**

The unique shimless moldboard retention system reduces the potential for blade chatter. Adjusting screws keep the moldboard's wear strips aligned for precise blade control and dramatic reductions in service time.

**Replaceable Wear Inserts.** Tough, durable nylon composite wear inserts reduce rotational friction for maximum circle torque and longer component life. They are located between the drawbar and circle, and between the support shoes and circle. High load resistant brass wearstrips are placed between the blade mounting group and moldboard. This sacrificial wear system can be replaced easily and helps keep components tight for fine grading.

**Moldboard.** The tall moldboard and large throat clearance help move material quickly and efficiently. Heat-treated moldboard rails, tough, hardened cutting edge and end bits, and large diameter bolts assure reliability and longer service life. The moldboard side shift cylinder is positioned on left side to eliminate snow wing interference.

**Moldboard Positioning.** The blade link bar design extends the possibilities for moldboard positioning, most beneficial in mid-range bank sloping and in ditch cutting and cleaning.

**Circle Drive Slip Clutch.** This standard feature protects the drawbar, circle and moldboard from shock loads when the end of the blade encounters immovable objects. This feature also reduces the possibility of the grader making abrupt directional changes in poor traction conditions, protecting the machine, operator and surroundings.

**Circle Construction.** One-piece forged steel circle is built to stand up to high stress loads and provide structural durability. The front 240° of circle teeth are hardened to reduce wear and ensure component reliability.

**Drawbar Construction.** The A-frame drawbar uses a tubular design for high strength and optimum durability.

**Aggressive Blade Angle.** With a long wheelbase the operator can obtain aggressive moldboard angles, so material rolls more freely along the blade. This is particularly helpful when handling very dry materials or cohesive soils, and also reduces power requirements.

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## Structures

*The 14M frame is designed and built to exceed customers' expectations.*

**Front Frame Structure.** The 14M front frame is a formed structural carbon steel tube. This technology significantly reduces weld joints and delivers the durability you expect from Caterpillar.

**Rear Frame Structure.** The box-sectioned hitch design and cast axle mounting resists torsion loads and ensures structural durability. The integrated bumper ties the rear frame together as one unit, so the frame can withstand heavy-duty applications such as ripping and winging snow.

**Articulation Hitch.** A large tapered roller bearing at the lower pivot carries loads evenly and smoothly. A mechanical locking pin prevents frame articulation to ensure safety when servicing or transporting the machine.

**Steel Tandem Walkways.** Perforated raised steel walkways cover the tandems. This provides a sturdy platform for standing and walking, and additional protection for the brake lines.

## Engine

*The 14M combines power management with ACERT™ Technology to deliver maximum power and efficiency while reducing the environmental impact.*

**ACERT™ Technology.** ACERT Technology allows Cat engines to supply more power per unit of displacement without causing premature wear. This breakthrough technology reduces combustion temperatures by carefully regulating four core engine systems: fuel, air, electronics and after treatment. ACERT Technology enhances overall engine performance while dramatically reducing exhaust emissions.

**Power Management.** The 14M Power Management System automatically delivers an additional five horsepower in each forward gear 1st through 4th, and each reverse gear 1st through 3rd. This optimizes rim pull for all gears by balancing traction, speed and horsepower while conserving fuel. The system limits horsepower in lower gears, which helps reduce wheel slip where traction is limited. Variable Horsepower (VHP) is standard on the 14M. With the Variable Horsepower Plus (VHP Plus) option, an additional five-horsepower is delivered in each forward gear 5th through 8th for more power at higher speeds.

**Performance.** The Cat C11 engine meets specific performance requirements for 14M applications. These include delivering a 1,000 rpm working range, a 3962 m (13,000 ft) altitude capability before engine duration, high engine torque, proper horsepower-to-operating weight ratio, and increased productivity. Its superior torque and lugging capability can pull through sudden, short-term increases in loads, maintaining consistent, desirable grading speeds to get the work done faster without downshifting.

## 14M Power Management Horsepower Where You Need It

Gear	VHP kW (hp) – Net	VHP Plus kW (hp) – Net
Fwd. 1st	183 (245)	183 (245)
2nd	186 (250)	186 (250)
3rd	190 (255)	190 (255)
4th	194 (260)	194 (260)
5th	194 (260)	198 (265)
6th	194 (260)	201 (270)
7th	194 (260)	205 (275)
8th	194 (260)	209 (280)

**Hydraulic Demand Fan.** The hydraulic demand fan automatically adjusts cooling fan speed according to engine cooling requirements. This system reduces demands on the engine, putting as much as twelve horsepower more to the ground and improving fuel efficiency.

**Low Sound and Vibration Levels.** Rubber isolating mounts for the engine package provide significant sound and vibration reductions. Exterior sound levels are 109 dB(A) using ISO 6395. The sound suppression group lowers exterior sound levels below 107 dB(A), complying with European Union 2000/14/EC. This quiet operation lets the 14M work with minimal disturbance to surroundings.

**Exhaust Emissions Compliant.**

The Cat C11 with ACERT Technology meets or exceeds all U.S. EPA Tier 3 and European Union Stage IIIa emissions control standards.

**Fuel Delivery.** The C11 engine with ACERT Technology uses multiple injection fuel delivery to precisely shape the combustion cycle. Several small ignitions lower combustion chamber temperatures, generates fewer emissions and optimizes fuel combustion. Bottom line: more work output for your fuel cost.

## Power Train

*Integrated, electronically controlled systems, deliver smooth reliable performance with reduced operating costs.*

### **Electronically Controlled Transmission.**

Full Electronic Clutch Pressure Control (ECPC) system optimizes inching modulation and smoothes shifting between all gears and directional changes. This provides outstanding control and extended transmission life. A load compensation feature ensures consistent shift quality over a broad range of applications.

**Engine Over-Speed Protection.** Protects transmission and extends component life by preventing downshifting until a safe travel speed has been established.

### **Power Shift Countershaft Transmission.**

Designed and manufactured specifically for the 14M, the direct drive countershaft transmission is matched with the powerful C11 engine to maximize power to the ground.

**Direct Drive.** Delivers superior fuel efficiency and “feel” of blade loads, material hardness and ground speed.

**Gear Selection.** Eight forward and six reverse speeds give the operator a wide operating range. The specifically designed range of gears ensures maximum productivity in all earthmoving applications.

**Inching Pedal.** Allows precise control of machine movements in any gear with low pedal effort and excellent modulation, critical in close-quarter work or finish grading.

**Programmable Autoshift.** The operator can easily customize various shift parameters through Cat Messenger, to match the specific application requirement. This feature automatically shifts the transmission at optimal points so the operator can focus on work, improving safety, productivity and ease of operation.

**Modular Rear Axle.** The 14M incorporates a bolt-on modular rear axle design, offering easy access to differential components, improving serviceability and contamination control, and lowering operating costs

**Front Axle.** The Caterpillar sealed spindle keeps the bearings lubricated and free from contaminants. They will never require repacking with grease. This durable low maintenance design reduces the customer’s owning and operating costs. Two double tapered roller bearings support the wheel spindle. The Cat “Live Spindle” design places the larger tapered roller bearing outboard where the load is higher, extending bearing life.

### **Reduced Noise and Vibration.**

The engine and transmission are isolation mounted as a unit to reduce noise and vibrations, improving operator comfort and minimizing external sound levels.

**Hydraulic Brakes.** The oil bathed, multi-disc service brakes are hydraulically actuated, providing smooth predictable braking and lower operating costs. With the largest total brake surface area in the industry, the 14M delivers dependable stopping power and longer brake life.

**Brake Location.** Brakes are located at each tandem wheel to eliminate braking loads on the power train. Redundant systems at each tandem provide the highest operational safety.

### **Brake Serviceability and Reliability.**

An easily accessible brake wear indicator/compensator system maintains consistent brake performance and indicates brake wear without disassembly. This system cuts service time and extends brake service life.

**Parking Brake.** Spring-applied, hydraulically released multi-disc parking brake can be easily serviced without transmission removal to reduce operating cost. Operator Presence System keeps the parking brake engaged until the operator is seated for safe operation.

## Hydraulics

*The 14M electro-hydraulics enable advanced machine controls with precise and predictable movements.*

### **Advanced Electro-Hydraulic System.**

The 14M incorporates a state-of-the-art electro-hydraulic system. This technology is the foundation for revolutionary changes of the machine and implement controls. Advanced joystick controls provide unmatched controllability, precision and predictable hydraulic movements, with the reliability you expect from Caterpillar.

### **Load Sensing Hydraulics (PPPC).**

The time proven load-sensing system and the advanced proportional priority pressure-compensating (PPPC, or “triple-PC”) electro-hydraulic valves on the 14M are designed to provide superior implement control and enhanced machine performance in all applications. Continuous matching of hydraulic flow and pressure to power demands creates less heat and reduces power consumption.

### **Consistent and Predictable Movement.**

PPPC valves have different flow rates for the head and rod ends of the cylinder. This insures consistent extension and retraction speeds for each cylinder, and gives the operator a consistent and predictable response every time an implement control is moved.

**Blade Float.** Blade float is built into the blade lift control valves, and is optional for some auxiliary hydraulic functions. The blade float feature allows the blade to move freely under its own weight. By floating both cylinders, the blade can follow the contours of the road when removing snow. Floating only one cylinder permits the toe of the blade to follow a hard surface while the operator controls the slope with the other lift cylinder.

**Balanced Flow.** Hydraulic flow is proportioned to ensure all implements operate simultaneously with little effect on the engine or implement speeds. If demand exceeds pump capacity, all cylinder velocities are reduced by the same ratio. The result is improved productivity in all applications.

**Optional Hydraulic Lockout.** A simple switch located in the cab disables all implement functions while still providing machine steering control. This safety feature is especially useful while the machine is roading.

**Cat® XT™ Hose.** Caterpillar hose technology allows high pressures for maximum power and reduced downtime. Intelligent routing minimizes exposure to damage. Hose clips prevent hose rubbing and excessive vibration, for lower owning and operating costs.

**Independent Oil Supply.** Large separate hydraulic oil supply prevents cross-contamination and provides proper oil cooling, which reduces heat build-up and extends component life.

### **Reduced Sound and Vibration.**

The electro-hydraulic system makes it possible to relocate the hydraulic valves and main implement pump away from the operator station. This reduces sound and vibration levels, and eliminates unnecessary components.

# Integrated Electronic Solutions

*Full systems integration optimizes machine performance and availability.*

**“Smart Machine”.** The 14M fully integrates all core systems creating a “Smart Machine.” The Cat data link shares key data among systems, optimizing machine performance while preventing potential machine damage.

**Cat Messenger.** Standard on the 14M, Cat Messenger provides real-time machine performance and diagnostic data with an easy-to-use interface. Messenger monitors all system data and alerts the operator of any faults through a digital text display that can be shown in multiple languages.

**Diagnostics.** Cat Messenger combined with full systems integration enhances the diagnostic capability of the 14M. Machine system errors are displayed in text as well as with fault codes, allowing service technicians to quickly analyze critical machine data, increasing machine availability.

**Electronic Technician (Cat ET).** Cat ET is a two-way communication tool that gives service technicians easy access to stored diagnostic data and lets them configure the machine parameters through the Cat Data Link. This integrated feature reduces machine downtime and lowers operating costs.

**Optional Automatic Blade Control.** The AccuGrade system automatically controls the blade, improving operator efficiency and productivity. AccuGrade reduces the need for traditional survey stakes or grade checkers, so you can reach grade faster and in fewer passes than ever before.

**AccuGrade Attachment Ready.** The AccuGrade system is fully integrated into the 14M design making installation quick and easy. Integral hydraulic and electrical components are standard on the 14M. The AccuGrade Attachment Ready Option (ARO) provides additional mounting brackets and electrical harnesses for easy installation of the Cross Slope, Sonic, Laser, GPS or ATS electronics kits.

**Machine Security System (MSS).** The optional MSS uses electronically coded keys, selected by the customer, to limit usage by specific individuals or times of the day. MSS deters theft, vandalism and unauthorized use.

**Product Link.** The optional Product Link system streamlines diagnostic efforts, and reduces downtime, maintenance scheduling and costs by providing a communication flow of vital machine data and location. Product Link gives automatic updates on machine parameters such as machine hours, machine condition, location, fault codes and alarms.

**Low Battery Elevated Idle.** After the 14M is at low idle for an extended period and low system voltage is detected, idle speed is raised. This ensures adequate system voltage and improves battery reliability.

**Automatic Engine Deration.** Protects the C11 engine by automatically lowering engine torque output and alerting the operator if critical conditions are detected.

## Work Tools and Attachments

*The work tools and optional attachments for the 14M expand machine versatility, utilization and performance.*

**Moldboard.** The 14M moldboard is made of durable Cat DH-2 steel. It is designed for maximum material flow/roll for superior productivity. A submerged arc welding process is used for the moldboard mounting, and slide rails are hardened to help ensure long component life.

**Ground Engaging Tools (GET).** A wide variety of Caterpillar GET is available on the 14M, including cutting edges, graderbits and end bits, all designed for maximum service life and productivity.

**Ripper.** The 14M optional ripper is made to penetrate tough material fast and rip thoroughly, for easier material movement with the moldboard. The ripper includes three shanks with the ability to add four more if needed.

**Snow Removal Work Tools.** Caterpillar Work Tools offers a variety of snow removal equipment specifically for the 14M. Multiple snow plow, snow wing and mounting options are available, adding additional machine versatility and utilization throughout the year.

**Front Mounted Groups.** A front mounted push plate/counterweight or front lift group can be added on the 14M. The Caterpillar Work Tools front lift group can be combined with a front dozer blade or front scarifier for added versatility.

**Automatic Lubrication System.** The optional Lincoln AutoLube System maintains the proper grease lubrication on working surfaces, significantly extending component life. Contaminants are purged from open pins and bushings to help prevent dirt from damaging critical components.

**Rear View Camera.** The optional Work Area Vision System rear view camera helps improve job site safety with a color monitor mounted in the cab.

**Air Compressor.** An optional air compressor is available, giving you a convenient on-board air system to blow debris off the machine, operate power tools and fill tires.

**Blade Lift Accumulators.** This optional feature uses accumulators to help absorb impact loads to the moldboard by allowing vertical blade travel. Blade lift accumulators reduce unnecessary wear on machine structures and helps to increase the comfort and safety of the operator.

**Front and Rear Fenders.** To reduce the build-up of mud, snow and debris as well as flying objects from the tires, non-metallic front and rear fenders can be added. The front fenders are designed to follow the tires through turns, and accommodate wheel lean.

## Serviceability and Customer Support

*Simplified service, world-class product support and Cat dealer trained experts keep your fleet up and running, maximizing your equipment investment.*

**Grouped Service Points.** Operators are more likely to perform daily inspections when they can do it with ease. The 14M groups daily service points in the left side service center to help ensure proper maintenance and inspection routines.

**Extended Service Intervals.** The 14M extended service intervals, such as 500-hour engine oil changes and 4000-hour hydraulic oil changes, reduce machine service time and increase machine availability.

**Ecology Drains.** Conveniently located ecology drains shorten service times and help keep the environment safe by preventing spills.

**Diagnostics and Monitoring.** The 14M integrates Cat Messenger, Cat Electronic Technician and S•O•S<sup>SM</sup> Sampling ports for easy monitoring and fast troubleshooting, which keeps your machine up and running.

**Machine Selection.** Make detailed comparisons of the machines under consideration before purchase. Cat dealers help you size the right machine for your operations and can estimate component life, preventive maintenance cost, and the true cost of production.

**Purchase.** Consider the financing options available, as well as day-to-day operating costs. Look at dealer services that can be included in the cost of the machine to yield lower equipment owning and operating costs over the long run.

**Maintenance Services.** Repair option programs guarantee the cost of repairs up front. Diagnostics programs such as Scheduled Oil Sampling, S•O•S<sup>SM</sup> analysis, Coolant Sampling and Technical Analysis help avoid unscheduled repairs.

**Product Support.** You will find nearly all parts at our dealer parts counter. Cat dealers use a world-wide computer network to track in-stock parts to minimize machine down time. Save money with genuine Cat Reman parts. You receive the same warranty and reliability as new products at substantial cost savings.

## Engine

Engine Model	Cat® C11 ACERT™ VHP	
Displacement	11.1 L	677 in <sup>3</sup>
Bore	130 mm	5.1 in
Stroke	140 mm	5.5 in
Torque rise	26%	
Max torque @ 1,000 rpm	1447 N·m	1,067 lb ft
Speed @ rated power	1,800 rpm	
Number of cylinders	6	
Derating altitude	3962 m	13,000 ft
Std – Fan speed	– max	1,450 rpm
	– min	550 rpm
Std – Ambient Capability	43° C	109° F
Hi Ambient – Fan speed	– max	1,650 rpm
	– min	550 rpm
Hi Ambient Capability	50° C	122° F

Base Power (1st gear) – Net	183 kW	245 hp
VHP range – Net	183-194 kW	245-260 hp
VHP Plus range – Net	183-209 kW	245-280 hp

- Net power is tested per ISO 9249, SAE J1349, and EEC 80/1269 Standards in effect at the time of manufacture.
- VHP Plus is an optional attachment.
- Net power advertised is the power available at rated speed of 1800 rpm, measured at the flywheel when engine is equipped with fan, air cleaner, muffler and alternator.
- No derating up to 3962 m (13,000 ft) altitude. Deration rate of 1% above 3962 m (13,000 ft) and deration rate of 3% above 4267 m (14,000 ft) per 305 m (1,000 ft).
- Net power when cooling fan is at minimum speed can be calculated by adding 9 kW (12 hp) to each gear horsepower value

## 14M Net Power

Gear	VHP kW (hp) – Net	VHP Plus kW (hp) – Net
Fwd. 1st	183 (245)	183 (245)
	2nd	186 (250)
	3rd	190 (255)
	4th	194 (260)
	5th	194 (260)
	6th	194 (260)
	7th	194 (260)
	8th	194 (260)
Rev. 1st	183 (245)	183 (245)
	2nd	186 (250)
	3rd – 6th	190 (255)

## Power Train

Forward/Reverse Gears	8 Fwd/6 Rev	
Transmission	Direct drive, power shift, Countershaft	
Brakes – Service	oil-actuated, oil-disc	
	– Service, surface area	34 500 cm <sup>2</sup> 5,347 in <sup>2</sup>
	– Parking	Spring applied, hydraulically released
	– Secondary	Oil-actuated, oil-disc

## Hydraulic System

Circuit type	Electro-hydraulic load sensing, closed center	
Pump type	Axial piston	
Pump output	280 L/min	74 gal/min
Maximum system pressure	24 150 kPa	3,500 psi
Standby Pressure	3100 kPa	450 psi

- Pump output measured at 2,150 rpm

## Operating Specifications

Top Speed – Fwd.	48.3 km/h	30 mph
– Rev.	38.2 km/h	23.8 mph
Turning radius, outside front tires	8.3 m	27 ft 3 in
Steering range – left/right	47.5°	
Articulation angle – left/right	20°	
Fwd. 1st	4.2 km/h	2.6 mph
2nd	5.7 km/h	3.5 mph
3rd	8.3 km/h	5.2 mph
4th	11.5 km/h	7.1 mph
5th	17.8 km/h	11.1 mph
6th	24.1 km/h	15 mph
7th	33.2 km/h	20.6 mph
8th	48.3 km/h	30 mph
Rev. 1st	3.3 km/h	2.1 mph
2nd	6.2 km/h	3.9 mph
3rd	9 km/h	5.6 mph
4th	14 km/h	8.7 mph
5th	26.3 km/h	16.3 mph
6th	38.2 km/h	23.8 mph

## Service Refill

Fuel Capacity	492 L	130 gal
Cooling system	46.5 L	12.3 gal
Hydraulic system – total	114 L	30.1 gal
– tank	65 L	17.2 gal
Engine Oil	30 L	7.9 gal
Differential/Final Drives	67 L	17.7 gal
Tandem housing (each)	96.5 L	25.5 gal
Front wheel spindle bearing housing	0.9 L	0.24 gal
Circle drive housing	6 L	1.6 gal

## Frame

Circle – diameter	1822 mm	71.75 in
– blade beam thickness	50 mm	2 in
Drawbar – height	203.2 mm	8 in
– thickness	76.2 mm	3 in
Front frame structure – width	304.8 mm	12 in
– height	406.4 mm	16 in
– thickness	15.9 mm	0.6 in
Front axle – height to center	621 mm	24.5 in
– wheel lean, left/right	17.1°	
– total oscillation per side	32.0°	

## Tandems

Height	616 mm	24.25 in
Width	214 mm	8.4 in
Sidewall thickness – inner	20 mm	0.8 in
– outer	20 mm	0.8 in
Drive chain pitch	57 mm	2.24 in
Wheel axle spacing	1656 mm	65 in
Tandem oscillation – front up	15°	
– front down	25°	

## Moldboard

Blade Width	4.267 m	14 ft
Moldboard Height	688 mm	27 in
Thickness	25 mm	1 in
Arc radius	413 mm	16.3 in
Throat clearance	117 mm	4.6 in
Cutting edge – width	203 mm	8 in
– thickness	16 mm	0.6 in
End Bit – width	152 mm	6 in
– thickness	16 mm	0.6 in
Blade Pull – max GVW	17 967 kg	39,610 lb
– base GVW	13 896 kg	30,636 lb
Down Pressure – max GVW	15 674 kg	34,555 lb
– base GVW	10 074 kg	22,210 lb

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

## Blade Range

Circle centershift – right	520 mm	20.5 in
– left	650 mm	25.5 in
Moldboard sideshift – right	790 mm	31.1 in
– left	650 mm	25.6 in
Maximum blade position angle	65°	
Blade tip range – forward	40°	
– backward	5°	
Maximum shoulder reach outside of tires		
– right	2082 mm	82 in
– left	2057 mm	81 in
Maximum lift above ground	419 mm	16.5 in
Maximum depth of cut	438 mm	17.3 in

## Ripper

Ripping depth, maximum	401 mm	15.8 in
Ripper shank holders	7	
Shank holder spacing – min	373 mm	15 in
	– max	472 mm 19 in
Penetration force	10 676 kg	23,541 lb
Pryout force	11 804 kg	26,028 lb
Machine length increase, beam raised	1130 mm	44.5 in

## Weights

Gross Vehicle Weight, base	21 151 kg	46,630 lb
– front axle	5711 kg	12,590 lb
– rear axle	15 440 kg	34,040 lb
Gross Vehicle Weight, max	28 849 kg	63,600 lb
– front axle	8885 kg	19,588 lb
– rear axle	19 963 kg	44,011 lb

- Base operating weight calculated on standard machine configuration with 16.00-24 12PR (G-2) tires, full fuel tank, coolant, lubricants and operator.

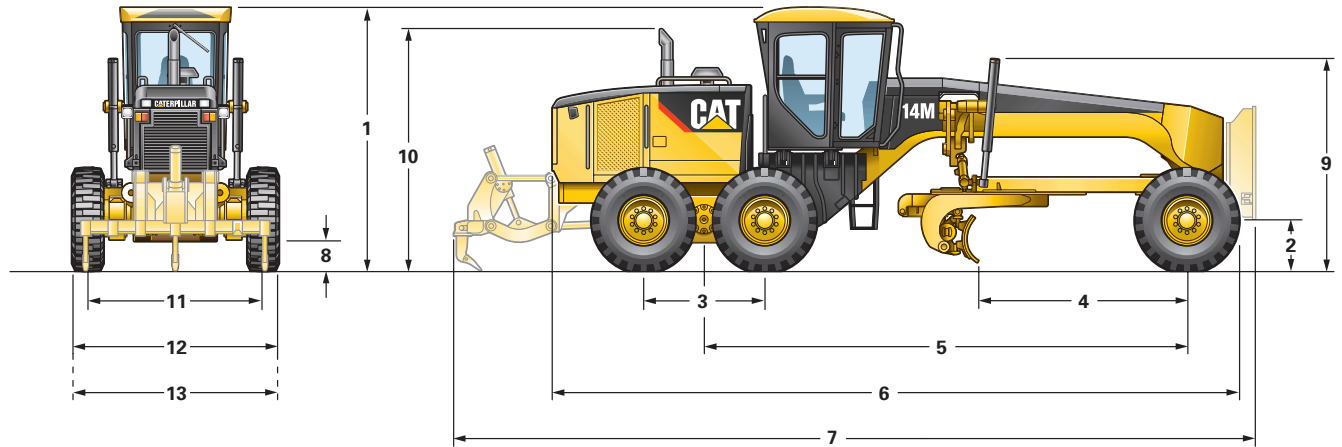
## Cab

ROPS/FOPS ISO 3471/ISO 3499

- ROPS (Rollover Protective Structure) meets the following criteria: SAE J396, SAE J1040 APR 88, ISO 3471:1986, ISO 3471:1974
- FOPS (Falling Object Protective Structure) meets the following criteria: SAE J231 JAN 81, ISO 3449:1984, ISO 3449:1992 Level II

# Dimensions

All dimensions are approximate.



1	Height – top of cab	3516 mm	138.4 in
2	Height – front axle center	621 mm	24.5 in
3	Length – between tandem axles	1656 mm	65 in
4	Length – front axle to moldboard	2842 mm	112 in
5	Length – front axle to mid tandem	6559 mm	258 in
6	Length – front tire to end of rear frame	9437 mm	371.5 in

7	Length – counterweight to ripper	10 896 mm	429 in
8	Ground clearance at rear axle	364 mm	14 in
9	Height to top of cylinders	2840 mm	112 in
10	Height to exhaust stack	3231 mm	127.2 in
11	Width – tire center lines	2361 mm	93 in
12	Width – outside rear tires	2795 mm	110 in
13	Width – outside front tires	2795 mm	110 in

## Standard Equipment

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

### OPERATOR ENVIRONMENT

- Articulation, automatic Return-to-Center
- Ashtray and lighter
- Armrest, adjustable
- Centershift pin indicator
- Coat hook
- Cup holder
- Cat Messenger, operator information system
- Display, digital speed and gear
- Door, driver access (left side) with wiper
- Gauges – fuel, articulation, engine coolant temp, system voltage
- Hour meter, digital
- Joystick hydraulic controls implements steering transmission
- Lights, nighttime cab
- Mirror, inside rearview, wide angle
- Rear vent
- ROPS cab, sound suppressed
- Seat, cloth-covered, comfort suspension
- Seat belt, retractable 89 mm (3 in)
- Storage area for cooler/lunchbox
- Throttle control, electronic
- Windows, laminated glass:
  - fixed front with intermittent wiper
  - right side with dual wipers, (door optional)
  - side and rear (3)

### POWER TRAIN

- Air cleaner, dual stage, dry type, automatic dust ejector, service indicator through Cat Messenger
- Air-to-air after cooler (ATAAC)
- Belt, serpentine, automatic tensioner
- Brakes, four-wheel hydraulic
- Differential, lock/unlock
- Drain, engine oil
- Electronic over speed protection
- Engine, Cat® C11 with ACERT™
- Ether starting aid
- Fuel-water separator
- Hydraulic demand fan
- Muffler, under hood
- Parking brake – spring applied, hydraulic released
- Priming pump, fuel
- Rear axle, modular
- Sediment drain, fuel tank
- Transmission, 8F/6R, power shift, direct drive
- VHP (Variable Horsepower)

### ELECTRICAL

- Alarm, back up
- Alternator, 80-ampere, sealed
- Base ARO – Cab harness, software, electrical hydraulic valves
- Batteries, maintenance free, 1125 CCA
- Breaker panel, ground accessible
- Electrical system, 24V
- Lights, reversing
- Lights, stop and tail, LED
- Product Link Ready

### OTHER STANDARD EQUIPMENT

- Anti-glare paint
- Brake accumulators, dual certified
- Bumper, rear, integrated with hitch
- Clutch, circle drive slip
- Cutting edges
  - curved DH-2 steel
  - 203 mm × 16 mm (8 in × 5/8 in)
  - 19 mm (3/4 in) mounting bolts
- Doors (3), engine compartment, locking
- Drawbar – 6 shoe with replaceable wear strips
- Endbits
  - 16 mm (5/8 in) DH-2 steel
  - 19 mm (3/4 in) mounting bolts
- Extended Life Coolant to –35° C (–30° F)
- Fluid check, ground level
- Frame, articulated, with safety lock
- Fuel tank, ground level access
- Guards, debris, underside
- Guards, service center debris
- Ground level engine shutdown
- Hammer (emergency exit)
- Horn, electric
- Hydraulics, base 8 implement controls
- Hydraulics, load-sensing
- Lockout, hydraulic implement for roading
- Moldboard
  - 4267 mm × 686 mm × 25 mm (14 ft × 27 in × 1 in)
  - hydraulic sideshift and tip
- Radiator cleanout access
- Serviceability, LH side
- Secondary steering
- S•O•S<sup>SM</sup> ports: engine, hydraulic, transmission, coolant, fuel
- Tandem walkway/guards
- Tool box
- Tow hitch

### TIRES, RIMS, & WHEELS

- Partial allowance for tires and multi-piece rims

## Optional Equipment

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

	kg	lb
<b>ELECTRICAL</b>		
Alternator, 150 amp	2	5
Lights:		
12 lighting arrangements, plus HID options		
Warning: Beacon or Strobe	2	5
Batteries:		
heavy duty, 1125 CCA	7	15
extreme duty, 1400 CCA	14	30
Converter:		
24V to 12V	5	11
communications (CB)	5	11
Starter, electric, heavy duty 10 21		
<b>GUARDS</b>		
covers, screen	4	9
transmission	156	344
Guard, sound	91	200
<b>OPERATOR ENVIRONMENT</b>		
Air conditioner with heater	48	106
Door, cab, right hand side	11	25
Fan, defroster, rear window	2	4
Heater, cab	34	76
Lights, rear roading, drop down	2	4
Mirrors, outside:		
heated 24V	15	33
mounted	10	22
Radio ready, AM/FM or Satellite	9	20
Seat, air suspension, cloth	2	5
Shade, sun	2	5
Windows, cab sides rear, wiper	0	1
Wiper/washer, rear	2	4
<b>POWER TRAIN</b>		
Engine, variable horsepower plus (VHP plus)		
Fuel tank, fast fill	14	31
Oil, Hydraulic, Biodegradable Synthetic		
Precleaner, Sy-Klone	5	10
Transmission, autoshift	2	5

	kg	lb
<b>OTHER ATTACHMENTS</b>		
AccuGrade® System ARO	39	85
Accumulators, blade lift	71	156
AutoLube, Lincoln	23	50
Camera, rear view	27	60
Caterpillar Product Link 321SR	5	10
Compressor/tank, Air	23	50
Drain, ecology, engine wiggins	2	5
Fenders:		
front	72	158
rear	184	405
Heater, engine coolant:		
120V	1	3
220V	1	3
Hydraulic arrangements with one or more additional hydraulic valves are available for rear ripper, dozer, snow plow and snow wing.		
Security system	2	5
Snow wing mounting, frame ready	91	200
Sound suppression	11	25
Step, cab, right hand side	8	18
<b>WORK TOOLS/G.E.T.</b>		
Blade/moldboard, 4877 mm × 686 mm × 25 mm (16 ft × 27 in × 1 in)	136	299
Blade extension, 610 mm (2 ft) right/left hand	262	577
Cutting Edges, curved	43	95
Grader bit, narrow penetration, super penetration	181	400
Push plate, counterweight	851	1875
Ripper, rear	1552	3421
Ripper tooth	28	61
<b>MACHINE ARRANGEMENTS</b>		
European Arrangement		
Roading Arrangement, European		
Snow Arrangement		

# 14M Motor Grader Preliminary

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Materials and specifications subject to change without notice.

Featured machines in photo 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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