

# CAT® GRADE

TECHNOLOGIES FOR MOTOR GRADERS



# CAT GRADE FOR MOTOR GRADERS

When profit margins and budget targets are on the line, Cat® Grade for Motor Graders delivers the speed, efficiency, and spot-on accuracy you need to stay ahead of the game.

FAST, EFFICIENT, AND RIGHT ON THE MONEY

Cat Grade technologies automate blade control and key machine functions. This provides accurate guidance to help operators achieve precise grade targets in less time, with fewer passes and reduced operator input.



## GRADE TECHNOLOGY BENEFITS:

- + Faster, easier, safer and more accurate — every time
- + Factory integrated and optimized for maximum precision
- + Digital dash technology simplifies operation
- + Requires fewer people on the ground for greater safety

# CROSS SLOPE: ACHIEVE GRADE FASTER

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Cat Grade with Cross Slope automatically maintains the blade at a preset cross slope. This fully integrated system lets operators achieve grade faster and more accurately. They can do more work in the same amount of time, which saves fuel and improves material efficiency.

- + **Up to 40% better material efficiency** reduces sub-base preparation time and cost
- + **Keeps operators on target** by automatically controlling one side of the blade
- + **Saves time and money** by reaching target slope quickly and with high accuracy
- + **Maintains a smooth, consistent slope** when the blade is lowered and raised — no lag between automatic and manually controlled sides of the moldboard
- + **Factory-integrated software** makes controlling cross slope easy — main machine display gives operators all the information they need at a glance





# GRADE WITH 3D: BOOST ACCURACY AND EFFICIENCY

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Cat Grade with 3D for motor graders is a fully machine-integrated system that helps you get to grade faster with more accuracy, efficiency and productivity. It automatically adjusts blade movements to follow the design plan using machine-integrated sensors and GNSS (Global Navigation Satellite System) guidance technology.

- + **Minimal set-up time** means you can get right down to business at the start of every shift
- + **Mastless receiver system** eliminates cumbersome exterior hardware, providing better moldboard visibility and more precise control
- + **GNSS receivers** are integrated into the cab roof and front frame for better protection, reducing chances for damage and improving system uptime
- + **A range of options** means you optimize your Cat Grade system to your needs and to a broader variety of applications.

# WORK SAFE, AVOID DAMAGE

- + **Mastless system** offers unlimited drawbar, circle, and moldboard movement with dual GNSS receivers integrated into the cab roof and front frame for better protection. Everything is built-in and calibrated at the factory for optimal performance and efficient operation.
  - Spend more time grading without daily setup and removal of components.
  - Reduces the potential for damage to machine components
- + **Factory E-fence capabilities** protect the machine and ease operation.
- + **Automatic moldboard centershift** keeps the operator following a guidance line if they steer away.
- + **Grade control buttons** are integrated into the joystick controls for seamless operation.

## E-FENCE PROTECTION

Mastless Cat Grade with 3D includes factory-installed E-fence capabilities. When activated, the E-fence system sets automatic boundaries to prevent the moldboard from contacting the tires and ladder. Plus, it prevents contact between the linkbar and top drawbar. The machine protects itself, freeing the operator to devote full attention to the tasks at hand.

With no masts and fully machine-integrated cabling, the potential for machine component damage is virtually eliminated. Operators can focus on the work and worry less about snagging machine systems and structures. All this with full use of functions such as moldboard pitch/tip, articulation, wheel lean, etc.





# GRADE TECHNOLOGY

## CONFIGURATION OPTIONS

### ATTACHMENT-READY OPTION

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Your machine comes from the factory ready for 2D or 3D systems, helping you save time and money. Additional attachments may be required based on machine model.

### CROSS SLOPE

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An integrated 2D system that enables operators to achieve grade faster and more accurately by automating the cross slope of the blade. Other cost-saving benefits include lower fuel consumption and up to 40% less material usage.

### LASER TECHNOLOGY

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Provides elevation control using manually configured, laser guidance where GNSS systems are impractical or unavailable. This 2D option can be combined with Cross Slope to control both elevation and slope of the blade for full automation blade control.

### SONIC TECHNOLOGY

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Another manually-configured, 2D alternative to satellite navigation, sonic technology tracks sound waves to provide elevation control. As with laser technology, it can be combined with Cross Slope for automatic blade control.

### UNIVERSAL TOTAL STATION (UTS)

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The UTS receiver gets a signal from a stationary transmitter on the jobsite, which provides location and elevation. This receiver is used in conjunction with the Cross Slope sensors to provide 3D control of the moldboard with very high accuracy.

### GNSS SOLUTIONS

Cat motor graders can be configured with GNSS technologies to match a variety of jobsites.

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**Single Mast GNSS** uses a 3D position from a single receiver in combination with information from the Cross Slope sensors to automatically control elevation and cross slope.

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**Dual Mast GNSS** uses two receivers in combination with Cross Slope sensors to automatically control blade adjustments and moldboard elevation.

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**Mastless GNSS** automatically controls elevation and slope without the need for masts on the machine. Mastless GNSS also includes Cat Grade with 3D and E-fence as standard.

# CAT GRADE SYSTEMS AT A GLANCE

SYSTEM	AVAILABILITY	APPLICATIONS	CONSIDERATIONS
<b>Attachment-Ready Option</b>	Offered from the factory	Factory preparation for future technology installation and upgrades	<ul style="list-style-type: none"> <li>Saves installation time and costs compared to standard machine</li> <li>Makes your machine ready for technology upgrade</li> </ul>
<b>Cross Slope</b>	Offered from the factory	<ul style="list-style-type: none"> <li>Road maintenance</li> <li>Road shaping</li> <li>Road ditching</li> <li>Sports fields</li> <li>Embankments</li> <li>Parking lots</li> </ul>	<ul style="list-style-type: none"> <li>Operator manually controls elevation</li> <li>Does not require a design file</li> </ul>
<b>Sonic with Cross Slope</b>	Offered through your Grade Control solutions provider	Any construction work with a finished surface or string line to follow	<ul style="list-style-type: none"> <li>Does not require a design file</li> <li>Requires a curb and gutter, string line or previous pass for elevation reference</li> <li>Operator steers the machine to maintain the sonic sensor within the external elevation reference</li> </ul>
<b>Laser with Cross Slope</b>	Offered through your Grade Control solutions provider	<ul style="list-style-type: none"> <li>Indoor work</li> <li>Pad construction</li> <li>Sports fields</li> </ul>	<ul style="list-style-type: none"> <li>Does not require a design file</li> <li>Works in flat and single- or dual-sloped applications</li> <li>Requires off-board laser transmitter</li> <li>Requires transmitter line-of-sight to the machine within 750 ft/228 m</li> <li>Range and accuracy affected by dust, fog, wind and other machines on the jobsite</li> </ul>
<b>Single Mast GNSS with Cross Slope</b>	Offered through your Grade Control solutions provider	<ul style="list-style-type: none"> <li>Large earthmoving projects</li> <li>Landfills</li> <li>Rough grading roads and highways</li> </ul>	<ul style="list-style-type: none"> <li>Requires management of 3D design data, GNSS base station setup and site calibration</li> <li>Requires off-board RTK correction signal infrastructure</li> <li>Requires a clear view of the sky — trees and tall buildings can interfere with satellite signals</li> </ul>
<b>Dual Mast GNSS with Cross Slope</b>	Offered through your Grade Control solutions provider	<ul style="list-style-type: none"> <li>Large earthmoving projects</li> <li>Complex designs</li> <li>Steep slopes</li> </ul>	<ul style="list-style-type: none"> <li>Requires management of 3D design data, GNSS base station setup and site calibration</li> <li>Requires off-board RTK correction signal infrastructure</li> <li>Requires a clear view of the sky — trees and tall buildings can interfere with satellite signals</li> </ul>
<b>Universal Total Station (UTS) with Cross Slope</b>	Offered through your Grade Control solutions provider	<ul style="list-style-type: none"> <li>Finish grading roads and highways</li> <li>Airport construction</li> <li>Complex commercial and residential site preparation</li> </ul>	<ul style="list-style-type: none"> <li>Requires management of 3D design data, UTS setup and site calibration</li> <li>Requires off-board UTS and 2400 MHz radio network correction signal infrastructure</li> <li>Requires UTS line-of-sight to the machine within 750 ft/228 m</li> <li>Each machine requires its own UTS</li> </ul>
<b>Mastless GNSS with Cross Slope</b>	Offered from the factory	<ul style="list-style-type: none"> <li>No restrictions due to masts</li> <li>Large earthmoving projects</li> <li>Complex designs</li> <li>Steep slopes</li> </ul>	<ul style="list-style-type: none"> <li>Requires management of 3D design data, GNSS base station setup and site calibration</li> <li>Requires off-board RTK correction signal infrastructure</li> <li>Requires a clear view of the sky — trees and tall buildings can interfere with satellite signals</li> </ul>

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