AccuGrade®
GPS Grade Control System

Track-Type Tractors

Machine Compatibility

D3G, D4G, D5G
D5N, D6N
D6R II, D7R II
D8T, D9T

CAT®
The AccuGrade® GPS Grade Control System

Advanced GPS technology moves the design plan to the cab for greater operator control, increased accuracy, higher productivity and lower operating costs.

The AccuGrade GPS Control System uses high technology blade control and guidance systems that allow the operator to grade to improved accuracy, without the need for survey stakes. Digital design data file, allows operator guidance features and automated blade control to help the operator achieve grade faster, meaning higher productivity, lower operating costs, and greater profitability.

AccuGrade GPS uses advanced Global Positioning System (GPS) technology to deliver precise-blade positioning and guidance from the off-board system to the machine-mounted components, an off-board GPS base station, and Real Time Kinematic positioning, GPS provides the information necessary to the system to accurately determine blade positioning with centimeter level accuracy.

The AccuGrade® GPS system integrates into the machine electronics and hydraulic system for optimum blade response time and maximum grade control in all conditions. The system integrated cab and joysticks allow easy operation and maintains quality results with minimum training.

AccuGrade GPS is designed for a wide range of construction applications, from high clearing with high production rates to finishing grading with high accuracy.

For single and dual blade systems, such as bulldozer, laser or GPS based systems, the operator simply uses the guidance features to steer the machine for consistent, accurate grades and slopes all day long without incurring higher productivity with less fatigue.

The off-board system computes the positional information on the machine and communicates this to the operator’s guidance features.

Dualj The patented dual AccuGrade GPS system design provides total blade orientation or directly measuring both edges of the blade. The dual design is not restricted by angular range of a singlej design. The dual design provides instant feedback on the right blade tip.

Singlej The singlej design is used by the machines’ GPS receivers to calculate high accuracy positions.

3D Design Software

The AccuGrade GPS system uses advanced GPS technology solutions move the design plan to the cab for greater operator control, increased accuracy, higher productivity and lower operating costs.

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Applications
Machine Components

1) GPS Receivers (MS980C). Two GPS receivers with integrated antennas are mounted on top of masts on each side of the blade.

GPS satellite signals received by the GPS receivers help define the horizontal and vertical position of the blade.

The GPS receivers allow the system to precisely measure the machine’s blade location with real-time centimeter accuracy for precise blade control and machine guidance.

2) Masts. Two rugged steel masts are mounted on the blade. The masts are used to position the GPS receivers above the blade for optimum GPS satellite reception.

3) Radio (TC900C/TC450C). The communications radio is mounted on the cab. The radio antenna is mounted above the roofline of the machine to ensure maximum radio signal reception.

The radio receives real-time Compact Measurement Record (CMR) data from the GPS base station data radio. CMR information is used to calculate high accuracy GPS positions.

4) In-Cab Display (CD550A). The in-cab graphical display with keypad allows the operator to interface with the system. It’s designed for simple operation using push buttons and a color display screen. Settings and views can be configured according to operator preference. As the machine operates, the operator can view the machine, blade positioning and elevation information relative to design plan, in real-time.

The machine uses design files to execute the site design plan. The files are stored on a compact flash data card, which is inserted into a slot below the keypad, and transferred to the display.

The data card stores a number of file types, including: 3D site designs, linework, GPS, machine and display configuration files.

5) Light Bars (LB400C). Three light bars are mounted in the machine cab and provide vertical and horizontal guidance to the operator. Bright green indicates “on grade” and amber indicates “above” or “below” grade.

6) Remote Switches.

• Auto Mode

• Manual Mode

7) Tilt Sensor (AS400C).

Connecting Cables.

Weatherproof Design.

The broadcast frequencies work in all weather conditions and penetrate clouds, rain and snow. GPS can also accurately guide operations in fog, dust and at night.

Views. The operator can work from five different display views.

• Plan View – a graphical guidance screen that displays an overhead view of the machine represented as an icon and the profile (long sections) of the design surface, represented by a line.

• Profile View – displays a side view of the machine, represented as an icon, and the profile (long sections) of the design surface, represented by a line.

• Cross-Section View – displays a cross-section of the design surface drawn through the blade tip, and the profile (long sections) of the design surface, represented by a line.

• Text Views – two configurable text screens allow basic guidance and status information to be displayed, such as cut/fill, design elevation, slope/cross-slope, northing/easting/elevation, offsets, radius, etc.

• Auto Mode
The AccuGrade® GPS Grade Control System...

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AccuGrade® GPS uses an advanced global positioning system (GPS) technology to deliver precise, blade position and grade control in all conditions. The machine-mounted components, an off-board GPS base station, and Real Time Kinematic positioning, provides GPS positioning information necessary to guide the operator to accurately achieve blade position and contoured level accuracy.

The AccuGrade® system computes the positioning information on the machine and compares the position of the blade relative to the design plan, and delivers that information to the operator for the quickest, simplest and most accurate blade knowledge! The AccuGrade® system is designed to work seamlessly in all conditions.

The AccuGrade® system integrates all the guidance information the operator needs to control the blade, all in the cab. It delivers information the operator needs to achieve grade, and all that knowledge is sent via a compact flash card!

AccuGrade® GPS is designed for a wide range of construction earthwork applications, from bid closing with high production rates to funds covering with light materials.

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Off-Board Components

GPS Receivers. The system uses GPS information to send positioning information to the machine. GPS receivers are used to deliver precise blade positioning, and is also used for the valve control information to the cab. Using the system, the operator can create blade control and guidance system that allows design plans to guide with increased accuracy, without the need for survey stakes. Digital design data, in-cab operator guidance features and automatic blade controls help the operator achieve grade faster, meaning higher productivity, lower operating costs, and greater profits!

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Features and Benefits

**Increases Productivity and Efficiency** by up to 50%

- Improves accuracy by more than 50% by using real-time data from GPS
- Reduces guesses and costly rework by up to 50%

**Range**: Up to 10 km (6.2 miles)

**Initialization**: Automatic

**LED status indicators**

- **Upper LED**: Power On
- **Middle LED**: Radio Signal Received
- **Lower LED**: GPS Signal Received

**Specifications**

**Storage Temperature**: -40°C to 70°C (-40°F to 158°F)

**Humidity**: 100% humidity-waterproof

**Vertical Accuracy**: 30 mm (1.2 in)

**IP Rating**: IP56

**Operating Temperature**: -30°C to 62°C (-22°F to 143°F)

**Weight**: 3.8 kg (8.3 lb)

**Width**: 95 mm (3.7 in)

**Height**: 228 mm (9 in)

**Depth**: 89 mm (3.5 in)

**Power Consumption**: <20 watts

**Input Voltage**: 9 to 32 V DC

**Control Interface**: SAE J1939 CAN

**Plug and play connections allow fast, easy integration into Cab and Joysticks**

- **Safety Interlock** ensures blade is securely locked when system is inactive
- **Low power consumption**
- **IP56-rated housing**
- **16 color sunlight readable scratch-resistant display**
- **QVGA (320 x 240) color adjustable light output**

**Warranties**

- **Proven, optimized on-board electronics**
- **RTK positioning system**
- **License-free in US and Canada**
- **Routine maintenance reduces costs**

**Applications**

- **Increases safety and reduces job satisfaction**

**Bonuses with Leasing Strategies**

- **Reduces labor requirements and costs**
- **Customers can get the job done quicker**
- **Reduces need for stake-out and string lines**
- **Operator can adjust to check grade from the cab**

**Rugged, waterproof design**

- **Reduces survey costs up to 90%**
- **Provides more responsibility and accountability**
- **Reduces labor for staking as job progresses**

**Integrated into Cab-Machines**

- **Faster, more advanced electronics and hydraulic systems**
- **Components are designed into machine cab**
- **Integrates into the machine and provides customer support**

**Customer Support**

- **For over 25 years, Caterpillar has been providing electronic and electrical components and systems for the earthmoving industry – real world technology solutions that enhance the value of Caterpillar products and make customers more productive and profitable. Your Cat Dealer is ready to assist you with matching your system to the application or obtaining responsible, knowledgeable support**

**Cat Dealer Network** provides unmatched

- **Solutions that enhance the value of Cat products and make customers more productive and profitable. Your Cat Dealer is ready to assist you with matching your system to the application or obtaining responsible, knowledgeable support**

**AccoGrade GPS Grade Control System**: specifications

- **Height**: 95 mm (3.7 in)
- **Width**: 232 mm (9.1 in)
- **Depth**: 70 mm (2.8 in)
- **Weight**: .22 kg (0.5 lb)
- **Electrical Input**: 9-32V DC
- **Safety Interlock ensures blade is securely locked when system is inactive**
- **Shock resistant, fully sealed to ± 5 psi (220 kPa)**
- **Low-glare glass**
- **IP66-rated enclosure ensures connection is totally waterproof to non-submersible conditions**
- **17 key backlit keypad with 6 softkeys and contextual menu**
- **140 mm Diagonal, 16 color sunlight readable scratch-resistant display**
- **Operating Temperature**: -40°C to 70°C (-40°F to 158°F)
- **Humidity**: 95% Relative
- **LED status indicators**
- **Lower LED**: Radio Signal Received
- **Upper LED**: Power on
- **AS400C Tilt Sensor**
- **LB400C Light Bars**
- **CD550A Display**
- **MS980C GPS Receiver**
- **Integrated into Cat Machines**
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D5N, D6N
D6R II, D7R II
D8T, D9T

Materials and specifications are subject to change without notice. Equipment illustrated or pictured may contain optional equipment. See your Caterpillar dealer for available options.

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