

# Cat<sup>®</sup> Command for Dozing

D10T and D11T



## Command for Dozing Features

- Enables continued, safe operation when conditions become unsafe for operators to be on the machine.
- Removes operator from machine, reducing exposure to dust, noise and vibration.
- Direct integration with machine electronics provides quick response, access to all operational features, and notifications of critical machine health parameters.
- Joystick directional control, paddle type brake controls and functional icons common with the machine provide a familiar environment to reduce operator on-boarding.
- Optional avoidance zone feature (Cat Terrain required) provides visual and audible warning if the operator approaches identified area.



**Cat® MineStar™ System is the industry's broadest suite of integrated mine operations and mobile equipment management technologies configurable to suit your operation's needs.**

**Combining the Fleet, Terrain, Detect and Health capabilities of Cat MineStar System, Command enables you to implement remote control, semi-autonomous or fully autonomous mining equipment systems – offering unprecedented improvements in operator safety, equipment availability and site productivity.**

**Command for dozing enables remote control of Cat D10T, D11T and D11T CD large track-type tractors. Protecting the most valuable asset on a site, the operator, Command for dozing reduces the risk of injury by allowing safe operation of the machine in potentially hazardous environments.**

## Contents

Command for Dozing .....	3
Features and Benefits .....	4
On-board Components .....	5
Operator Console .....	6
Customer Support .....	6
Command for Dozing Specifications .....	7

# Command for Dozing

Remote control technology to keep your operators safe.

Keeping operators safe and out of harm's way is a top priority for you and Caterpillar. Avoiding potentially hazardous areas of a mine such as high walls, stockpiles, falling debris and steep slopes helps you achieve this goal. Command for dozing removes operators from these hazardous environments to a safer location with less risk and often in greater comfort.

Command for dozing utilizes wireless technology and on-board electronic systems to allow the machine to be controlled without an operator in the cab. This is ideal for mining and industrial applications including stockpile feeding, leach pad construction, and high wall operations. Command for dozing gives operators the ability to effectively operate the machine from outside of the cab, while maintaining visibility to critical machine health information.

The operator console enables line of sight machine control. The over-the-shoulder unit is ergonomically designed to minimize operator fatigue while controlling the machine at a safe distance from potentially hazardous working conditions.

Caterpillar's electronics integration enables the activation of several safety features to ensure that the operator remains in control of the machine at all times. For example, a machine shutdown will be activated when a loss of communication between the console and machine is detected, or if the operator console is tipped more than 60 degrees, which may indicate that the operator has fallen. Breaching an avoidance zone will result in the stopping of machine movement. Any stopping of the machine results in the application of parking brakes.



# Features and Benefits

Enhancing operator safety and comfort.



Command for dozing provides a number of safety benefits for the operator as well as your mining operation. Familiar control icons enable operators to switch between standard in-cab machine operation and remote control with little training or orientation. Integration of this technology system into the machine electronics enables reduced latency and quick response to commands from the operator console, keeping your operators productive and efficient.

## Enhanced Safety

- Reduces operator safety risks in the event of a high wall collapse, machine roll-over or fall.
- Limits potentially unhealthy, long-term exposure to vibration, dust and noise.
- Decreases potential for injury from slips, trips and falls when climbing on and off machine.
- Multiple, redundant safety features built-in to stop all motion of machine should one of these events occur:
  - One of three stop switches is pressed.
  - Loss of wireless communications.
  - Detection of a severe fault where continued operation will result in damage to the machine.
  - Operator console is tilted more than 60 degrees from normal operating position.
  - Machine enters an avoidance zone.

## Efficient Operations

Command for dozing is the only remote control solution that integrates directly with Cat machine electronic control systems. This integration saves installation time and speeds machine response time compared to aftermarket systems.

- Simple installation procedures provide step by step instructions to quickly and efficiently implement the system with minimal machine downtime. By utilizing the machine's existing hydraulic valves and electronic harnessing, reliability is greatly increased over non-integrated systems.
- Quick system response enabled through comprehensive machine integration of the electronic and hydraulic systems. Commands from the operator console are sent directly to the engine and implement electronics via a dedicated radio, reducing delays.
- Complete control with access to advanced features offered on Cat machines such as Autocarry and Auto Blade Assist.



# On-board Components

Rugged components for harsh mining environments.

Command for dozing includes rugged on-board components that are sealed to keep out dust and moisture. Exterior components are housed in steel enclosures to protect from damage.

## Indicator Lights

The roof-mounted electronics enclosure houses the antenna, indicator lights, and wireless receiver. The high intensity green LED lights indicate when the machine is in remote operation. The yellow and red LED lights are used to indicate when the machine is near or has entered an avoidance zone. These lights are housed in a rugged vibration isolated steel enclosure to minimize damage from falling debris. Three sets of lights enhance visibility from all directions around the machine.

## Ground Level Service Center

The ground level service center contains a remote/manual switch and an engine shutdown switch as well as optional ladder and delayed lighting switches. As Cat dozers can come equipped with a drawbar, ripper carriage or counterweight attachment, mounting kits are available to accommodate these different configurations.

## Wireless Transceiver

A rugged wireless transmitter/receiver is used to communicate between the operator console and the remote control electronics that are located on the machine. The transceiver is located within the roof-mounted electronics enclosure.

# Operator Console

Comfortable, rugged, functional.



The operator console allows for line of sight control of up to 400 meters (437.4 yd) with the option of a 900 MHz version or a 2.4 GHz version. The console and on-board transceiver utilize spread spectrum technology to virtually eliminate interference from other wireless devices utilizing the 900 MHz or 2.4 GHz frequency bands. Proprietary algorithms secure the communications between the on-board wireless receiver and the console, preventing communications from unauthorized devices.

The operator console has been ergonomically designed to enable an operator to work an entire shift comfortably. The console only weighs 3.85 kg (8.5 lb) with battery and is suspended on the operator by adjustable nylon straps. Controls have been laid out to allow the use of heavy gloves. At the end of the day, cleanup is easily performed as the console is sealed to enable cleaning with low pressure water spray.

Full functionality of the dozer is available through the operator console. Basic machine functions such as start-up/shutdown, blade control, gear selection, steering and ripper control among others are easily accessed through the ergonomic layout of the console controls all of which are protected from impact by the aluminum roll bar. Advanced options such as Auto Blade Assist and Autocarry (if machine-equipped) are also accessible from the console.

Critical machine and system status information is also delivered to the operator through an intuitive layout of the console. LED indicator lights and display show the operator the gear selection, temperatures, operational mode, faults, system status and low battery warning.

# Customer Support

Providing you with unmatched global support.

For more than 25 years, Caterpillar has been providing electronic and electrical components and systems for the mining industry – real world technology solutions that enhance the value of Cat products, making customers more productive and profitable. Your Cat dealer is ready to assist you with matching machine guidance systems to the application and obtaining responsible, knowledgeable support. From sales and implementation to support and service, count on your Cat dealer to provide all of your technology product needs.

# Cat Command for Dozing Specifications

## Operator Console

Weight	3.85 kg	8.5 lb
Temperature Range	-18° C to 65° C	0° F to 150° F
Water and Dust Intrusion	Console is sealed (IP 67)	
Frequency	2.4 GHz (2.4031 GHz to 2.4786 GHz) 900 MHz (902 MHz to 928 MHz)	
Modulation Type	Frequency hopping spread spectrum	
Transmit Power	Less than 10 mW	
Battery	9.6 Volt Nickel Metal Hydride	
Battery Duration	16 hours	

## On-board Receiver

Temperature Range	-40° C to 85° C	-40° F to 185° F
Frequency	2.4 GHz (2403.1 MHz to 2478.6 MHz) 900 MHz (902 MHz to 928 MHz)	
Modulation Type	Frequency hopping spread spectrum	
Transmit Power	Less than 10 mW	
Water and Dust Intrusion	Receiver is sealed (IP 69)	
Input Voltage	9 to 32 Volts	

## Standards Compliance

ISO 15817	Earthmoving Machinery – Safety Requirements for Remote Operator Control
AS/NZS 4240	Remote Controls for Mining Equipment

# Cat Command for Dozing

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

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