

# CAT® D6 XE

## NEXT GENERATION ELECTRIC DRIVE



### How Electric Drive Works

The electric drive system starts with a Cat C9.3B engine. But instead of powering a torque converter, the engine drives a generator which turns the mechanical engine power into electricity. And instead of a transmission, an electric motor powers the final drives. A power inverter is connected to both the generator and the motor by heavy-duty power cables and connectors, and this inverter controls the flow of electricity between the two components.

The electric motor can operate at all ground speeds, ensuring the dozer is always operating at the most efficient point possible. The electric drive components are fully sealed against the environment and liquid cooled, so the whole system performs efficiently and reliably in the most demanding dozer applications. Like a traditional powershift transmission in a high drive dozer, the D6 XE Electric Drive power train is completely modular, so internal components can be accessed quickly and efficiently.

The new Cat® D6 XE is the world's first high drive Electric Drive dozer. It reflects more than a decade of experience and continued Electric Drive development for track-type tractors and other machine families. Because of ongoing advances in design and proprietary testing, today's refined Electric Drive power train is even more simple, efficient and robust.

### The Benefits of Electric Drive

Electric Drive is the most efficient way to transfer power to the ground, so a dozer can get more work done while using significantly less fuel.

With Electric Drive, there are no gears to shift. Power to the ground is continuously optimized. Forward momentum continues throughout the push for faster cycle times. Operators just choose the ground speed and go. The electric drive is also a durable solution with no losses in efficiency over time.

The new D6 XE with Electric Drive offers a variety of benefits compared to traditional powershift dozers:

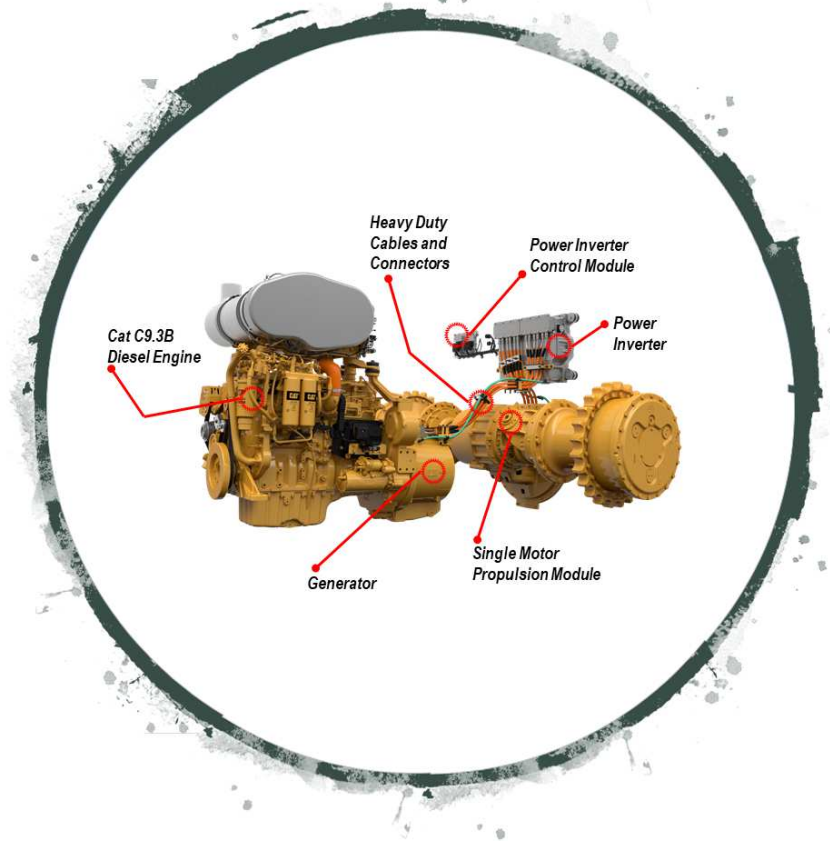
- Up to 35% better fuel efficiency
- Class-leading maneuverability and power
- Almost 90% fewer rotating parts than a traditional power train – generates less heat, aids serviceability and component life
- Reduced service and maintenance
- Added D6 XE productivity and reduced fuel cost mean customers looking for these benefits can expect to see payback of the added investment over a D6 in less than two years.<sup>1</sup>

*Note: All comparisons to 2014-2016 3-speed D6T dozer*

*<sup>1</sup>Productivity = BCM (BCY)/hour, fuel consumption = L (gal)/hour. Estimates based on average cost per bank cubic meters (cubic yards) of material moved in typical construction applications with 1,500 hours/year. Individual results may vary based on application, hour utilization, operator and other factors.*

## Next Generation Electric Drive Power Train

- Utilizes Switched Reluctance technology instead of a Permanent Magnet system
- Switched Reluctance uses a simple rotor design, which is more robust, generates less heat and is more power dense
- Eliminates the need for motor speed sensors
- Reduced heat allows for a simplified cooling system
- The propulsion module uses a single motor instead of two
- Power Train Electronic Control Modules (ECM) reduced from two to one
- Insulation in the motor system refined to support longer stator life
- Accessory systems separate from Electric Drive system for simplification



### An Evolution in Validation

Continued Electric Drive research and development has resulted in broader in-application experience, as well as innovations in testing.

Field testing in a variety of applications is ongoing, with more than 50,000 working hours already logged.

Caterpillar engineers have also developed advanced endurance testing that can put a lifetime of stress on a single component in a short amount of time.

The result is the next generation of robust, durable Electric Drive systems.

### D6 XE Serviceability

- Elevated sprocket provides simple service access – power train slides out from the back of the dozer like traditional machine
- Simplified diagnostics via Cat Electronic Technician
- New, serviceable power electronics components
- Easy access to power electronics through a panel in the back of the cab. If needed, generator accessible via 30-minute cab removal
- Parts and Labor costs are about 70% less for 10,000 hour rebuild vs. traditional power shift transmission
- D6 XE Assurance Plan covers parts and labor on everything related to the Electric Drive power train – generator, motor, power inverter and cables – should there be a defect or failure of those components. The 7-year/20,000 hour program is fully transferable\*

*\*Coverage is after standard warranty and EPP are over. Customer must perform reseal and rebearing as preventive maintenance.*

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