# R2900 XE UNDERGROUND LOADER









# CLEANER, FASTER, MORE POWERFUL.

Built on the platform of our most popular underground loaders, the new R2900 XE is the first Cat® diesel electric underground LHD. It's a productive, powerful, reliable machine built to meet the underground mining industry's need for bigger payloads, faster loading and reduced emissions.

Its powerful diesel electric drive engine is EU Stage V compliant, and it offers the power to match its class-leading 18.5-tonne (20.4-ton). The R2900 XE is highly productive, with smooth and quick machine responses combined with improved digging and tramming performance. Employing electric drive components reduces fuel burn and improves productivity—helping mines reduce greenhouse gas emissions and carbon footprint.

We also made the R2900 XE easier and less expensive to maintain. Major structures are designed for increased strength and easier maintenance, and other major components have been upgraded for longer life, lower consumable usage and reduced maintenance downtime. Flexible bucket and Ground Engaging Tool (GET) options make for a versatile machine that can get the job done no matter what you mine — or how far underground you mine it.

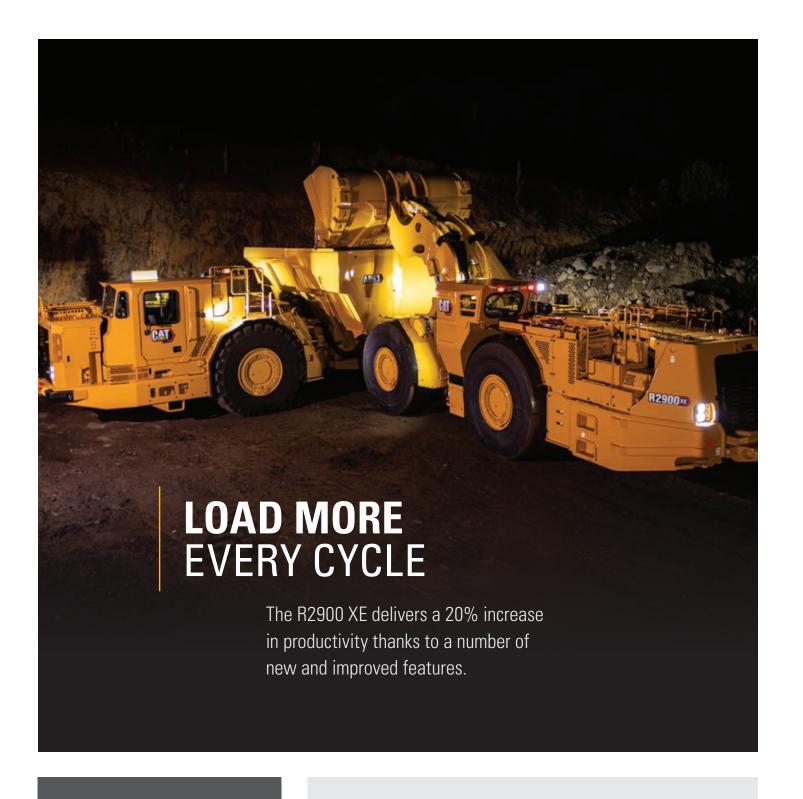
# REDUCED MAINTENANCE AND REPAIR

- » Diesel electric drive reduces maintenance and repair costs
- » Stronger frame for increased durability
- » Traction control maximizes tire life
- » Increased component life and extended service intervals

#### SUPERIOR PRODUCTIVITY

- » 18.5 tonne payload / 20.4-ton payload for 3- to 4-pass match with Cat AD63 truck
- » Instant machine response
- » 52% faster acceleration and reduced cycle times vs. previous model
- » Greater than 31% improvement in fuel efficiency during load and carry





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INCREASE IN PRODUCTIVITY

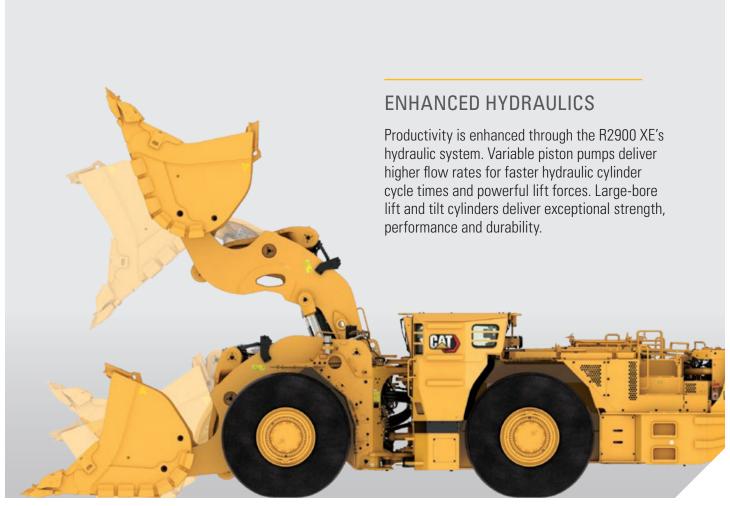
# **BIGGER PAYLOAD**

An 18.5 tonne (20.4 tonne) payload results in faster load times, making the R2900 XE a 3- or 4-pass match with the Cat® AD63 truck for greater efficiency and higher productivity.



## **FAST AND POWERFUL**

The R2900 XE features 52% quicker acceleration and improved machine response, giving operators greater control over the machine. It can accelerate from 0-24 km/h in 6.4 seconds, a 52% improvement over the R2900G, and achieves 7% higher speed on grade. The R1700-style lift arm can reach higher, making it faster and easier to load larger trucks, and improved hydraulic performance makes loading faster and easier. These improvements and more result in reduced cycle times, more material moved and lower cost per tonne.





# CLEANER AND MORE POWERFUL

#### **CLEAN DIESEL POWER**

The R2900 XE employs a highefficiency electric drive system and is powered by a quiet, reliable and durable Cat® C15 engine. With greater than 31% increased fuel efficiency and a variety of emission reduction and aftertreatment options — including an EU Stage V configuration and diesel particulate filtration — it provides the power you need while also reducing ventilation costs and helping you meet your sustainability goals. RPM, fuel burn, heat generation and exhaust emissions have all been reduced, while offering an increase in power.



#### HIGH-EFFICIENCY ELECTRIC DRIVE SYSTEM

The new R2900 XE features a proven switched reluctance electric drive system that is Caterpillar designed, integrated, validated and supported. The benefits include:

- + Improved power and cycle times
- + Continuously variable speed control
- + Implemented virtual gears for machine controllability

- + Smoother directional changing, with no driveline or powertrain shock loads
- + Programmable speed management, which improves operator efficiency and reduces fatigue
- + Neutral creep and coasting inhibitor
- + Torque control, which reduces brake applications





We understand that the most important factor in your loader's effectiveness is the performance of its operator. To help make their workday as productive as possible, we've incorporated productivity, safety and comfort features into the R2900 XE cab. The next-generation operator environment is built on the proven success of the R1700 platform, with the latest upgrades and improvements.

#### **INFORMATION DISPLAYS**

A high-resolution display gives operators real-time system information in 11 different languages, keeping them up to date on performance and machine status even before the engine starts. The display can be integrated into your mine's communications network and comes ready for Product Link<sup>TM</sup> Elite data analysis and Cat® MineStar<sup>TM</sup> connectivity.



#### IMPROVED COMFORT

In addition to an ergonomic seat and controls, the R2900 XE operator environment includes many features designed to enhance comfort and decrease fatigue. The enclosed design provides fresh, pressurized, temperaturecontrolled air circulation with air conditioning for a more comfortable working environment. Additional enhancements include a Ride Control System that smooths out the ride on uneven ground, smooth controlled directional shifts, reduced driveline shocks, and hydraulically cushioned bucket



# **DESIGNED FOR SAFETY** With two emergency exits, optional rear and side view cameras, and improved visibility, the R2900 XE cab is built with the safety of your people in mind. Rollover Protective Structure (ROPS) and Falling Objects Protective Structure (FOPS) are resiliently mounted to the frame to isolate the operator from vibration for a more comfortable ride. The operator present system helps ensure the safety of anyone working in, on or around the machine by preventing machine motion with no operator in the cab.

#### **DESIGNED FOR CONTROL**

The R2900 XE operator station is ergonomically designed for total machine control. All controls, levers, switches and gauges are positioned to maximize productivity and minimize fatique. STIC™ Steering and Transmission Integrated Control provides maximum responsiveness and control that combines directional selection, virtual gears and steering into a single lever. A twopedal design with improved spacing and position enables better foot control. Improved high and low beam lights offer autodirectional switching and automatic on and off functions. The R2900 XE's hydraulic system also improves operator control and boosts productivity. Low-effort electric-over-hydraulic joystick implement controls feature simultaneous lift and tilt functions to optimize operating efficiency.



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# **SAFETY-INFUSED**

The R2900 XE is infused with features to help both operators and service personnel feel safe and confident on the job.

Rollover Protective Structure (ROPS) and Falling Objects Protective Structure (FOPS) certified cab

Cab with interior and exterior safety details

Neutral creep and neutral coast inhibitors

Auto lights (high and low beam), auto directional switching and auto boom lights on-and-off functions

Operator Presence system door sensor and latch sensor

Standard seat belt monitoring system

Optional rear and side-view cameras

Stiffened cab roof above the door

Standard Secondary Steering System

Fire suppression activation from within the cab

Control group safety pins, articulation lock and hinged belly guards

Flat-fold handrails

Anti-skid tread on all walking surfaces

Ground-Level Service Access



Tire pressure monitoring system

Reliable, field-proven braking system

Ansul LVS (wet) Fire Suppression

Illuminated emergency stops on both sides of machine

Tow hook design is bolt-on, removable and triggers secondary steering on use



SPEND MORE TIME LOADING AND LESS TIME SERVICING





Reduced downtime and maintenance costs are key contributors to the R2900 XE's ability to achieve the lowest possible owning and operating costs. With more robust structures, increased powertrain durability, longer-lasting components, improved access to maintenance areas and extended service intervals, the R2900 XE can be maintained in less time for less money by fewer people — helping you lower cost per ton and keep your machines hard at work.



### IMPROVED FRAME AND POWERTRAIN

Leveraging proven designs, the R2900 XE's frame and powertrain are built to handle harsh underground mining conditions. By eliminating castings and reducing weight, we've increased the life and strength of the frame without sacrificing performance. And we've made a number of improvements to the powertrain that result in longer life, easier maintenance, reduced costs and a smoother ride.

A flipped articulation hitch improves durability and service life and a new front frame with a lower-mounted Y pin improves breakout. Sealed colletted pins are fitted to all major bucket and lift arm hinge points for longer pin and bushing life. Heavy duty steel lift arms with cast-steel cross-tube ensures extreme loads are efficiently dissipated for long service life.



# IMPROVED AXLES The R2900 XE features a new axle design that offers increased life, higher availability and a number of serviceability features and improvements. + Brake wear indicator & slack adjuster + Replaced final drive studs with bolts

# UPDATED WHEEL AND BRAKE DESIGNS

New, larger wheel bearings with optimized positioning and flange-mounted rims last longer and are easier to service.

The updated brake design offers increased capacity, remote mounted brake bleeders, easier service access and extended brake life.

The traction control system reduces tire spin, increasing tire life and reducing consumable costs.



# DOWNTIME-REDUCING FEATURES

A number of features and improvements make the R2900 XE easier and less expensive to maintain, driving down cost per ton and increasing availability.

- + Electric drive system with fewer moving parts and extended maintenance intervals
- + Single bolt-in fuel tank with ground level access for easy maintenance
- + Cold-side ground-level serviceability of engine
- + Radial seal air filters that are easy to change and maintain
- Fluid level checks made easier with sight gauges visible from ground level
- + Sealed electrical connectors, which lock out dust and moisture
- + Protective coverings on the harnesses and wires that are color and number coded for easy diagnosis and repair
- + A tow hook design that is bolt-on, removeable and triggers secondary steering on use
- + Radiator guard that swings open to allow service access







# GROUND ENGAGING TOOLS: FLEXIBILITY AND RELIABILITY

Caterpillar offers a number of Ground Engaging Tool (GET) options for Cat underground LHDs, so you can customize your machine to meet your site-specific needs and fit with your overall maintenance strategy. All Cat GET are built for strength and long life, so you can spend less time replacing shrouds.

### **Cat Modular Segment Welded GET System**

Modular shrouds deliver welded part reliability with the replacement simplicity of a mechanical system. Integrated bevel allows for faster weld installation time—20% faster than competitive shroud systems—and creates an 18% stronger modular shroud assembly by locking segments together. Wear indicators are visible from the top to help establish maintenance intervals.

#### **BOLT-ON HALF ARROW GET**

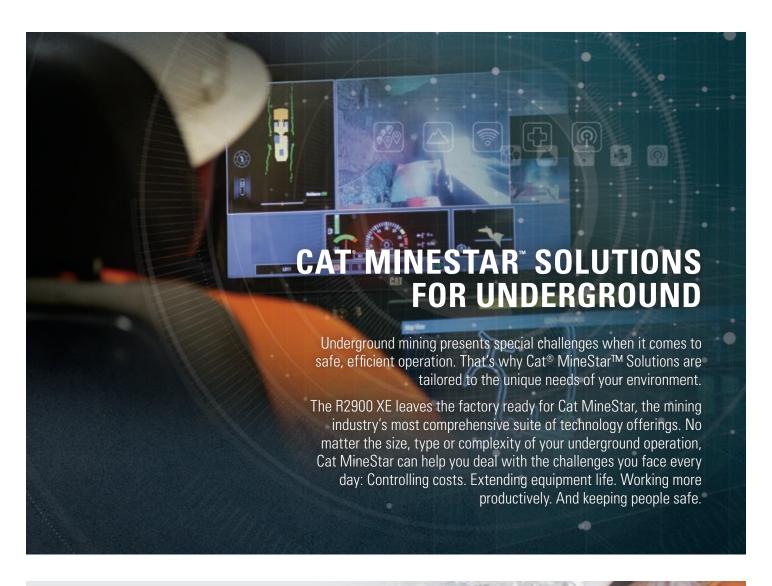
Cat bolt-on half arrow (BOHA) GET can reduce changeout times while extending the life of traditional weld-on GET options — allowing the R2900 XE's new bucket design to perform even better in heavy, hard-digging rock conditions. BOHA GET are bolted onto the bucket instead of welded — shortening replacement time from as much as 40 hours to as little as one or two. And with no need for welding, they are easier to replace.

# DURILOCK™ LIP SHROUD SYSTEM

The new Durilock Lip Shroud system for underground loader buckets is a flexible, productive option for all Cat underground LHDs. This new system features hammerless installation and maintenance-free retention of GET. Three interchangeable shroud styles allow you to configure your loader to its current application needs — without stopping to change the base edge or retention system.

- + Standard Wedge shape for general production and development
- + Abrasion Contoured to put more material on the shroud base
- + Penetration Less leading-edge material to easily penetrate dense material





#### **RUN YOUR LHDS REMOTELY**

with MineStar Command for underground

Command for underground enables remote operation of load-haul-dump machines — from simple line-of-sight to full autonomy — providing immediate productivity and efficiency gains and improving safety. Command allows you to relocate operators to a safe, comfortable location underground or on the surface. Automation improves accuracy of tunnel navigation, boosting productivity and reducing machine damage caused by contact with drive walls.



# GET ESSENTIAL OPERATIONAL INFORMATION

with MineStar Fleet for underground

Timely access to accurate information is key to running a productive mine. Fleet for underground provides real-time visibility to cycle time, payload, machine position and other key operational parameters and automatically records and tracks data up and down the value chain. Fleet can help you better understand machine usage, improve shift changes, manage tasks, maximize operational efficiency and more.

#### ADDITIONAL TECHNOLOGY SOLUTIONS

**Automated Functions** 

- New Autodig Components optimize loading by automating critical parts of the digging cycle.
- + Cat Payload Management (CPM) includes an integrated onboard payload weighing scale with material management, cycle count and time recording, and wireless production detail reporting capability.
- + Optional tire pressure monitoring is fully integrated, allowing operators, on the fly, to determine if their tires are properly inflated.

# ADDRESS RISKS TO PEOPLE AND ASSETS

with MineStar Detect for underground

Detect prevents unintended interactions between people and assets by letting you "see" in the dark. Using a high-precision peer-to-peer proximity detection system coupled with a revolutionary communications and tracking network, Detect can prevent incidents and track people and machines in real time and with no reliance on mine infrastructure. It provides operators continuous awareness of their surroundings, along with the location and status of all personnel and assets.



# MAKE INFORMED DECISIONS AND OPTIMIZE MAINTENANCE

with MineStar Health

Machine health data is critical to helping you improve the reliability of your mining equipment, reduce unplanned downtime and prevent costly failures. MineStar Health products and services enable you to collect and transmit equipment data that enables proactive maintenance services and predictive equipment analysis.

## **CAT PRODUCT LINK™ ELITE**

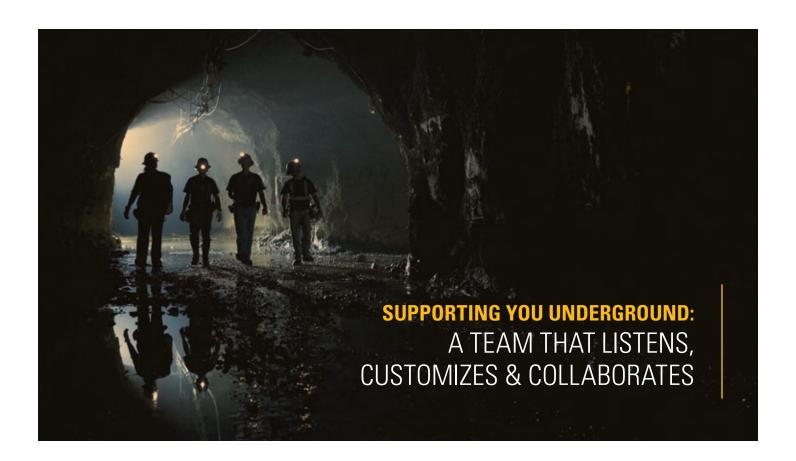
Product Link™ Elite system boosts connectivity and increases the availability of data provided by the R2900 XE. The on-board hardware enables the loader to collect and transmit information into locally hosted or cloud-hosted applications. The system opens the door for industry-leading equipment health and condition monitoring services from Caterpillar and your local Cat dealer.

# MINING — FOR A — BETTER WORLD

Governments and regulatory agencies mandate that you establish and follow environmentally sound policies and practices as you meet the demand for mined materials. We're focused on doing our part to make sure our machines help you meet those regulations. Every piece of Cat equipment is designed to be better and do better. Because the better we mine, the better the world can be.

At Caterpillar, we continue to research alternative energy sources such as biofuels and liquefied natural gas and power options like electrification to find new ways to reduce emissions. In addition, we preserve raw materials, conserve energy and reduce emissions through the Cat Reman program, which returns end-of-life components to like-new condition.

We've designed the R2900 XE to be more efficient and use less fuel, which reduces engine emissions. Its high-efficiency electric drive system is powered by a quiet, reliable and durable Cat® C15 engine. With up to 31% increased fuel efficiency and a variety of emission reduction and aftertreatment options — including an EU Stage V configuration and diesel particulate filtration — it reduces emissions, lowers ventilation costs and helps you meet your sustainability goals.



# YOUR PARTNER FOR THE COMPLETE EQUIPMENT LIFECYCLE

No one knows more about how to get the most from a piece of Cat equipment than Caterpillar and your local Cat dealer. Our partnership starts with validation and testing of the machine and continues through the complete lifecycle of the loader.

The one-of-a-kind Cat dealer support network delivers expert service, integrated solutions, aftersales support, fast and efficient parts fulfillment, world-class rebuild and remanufacturing capabilities and more.

Cat dealers operate as nearly 200 local businesses — each one fully embedded in and committed to the geographic area it serves. That means you work with people you know, who know your business, and who respond on your timeframe.

Caterpillar and Cat dealer personnel will partner with you on site to improve the performance not only of your LHD but of your overall loading and hauling operation.

You'll have access to parts and service, as well as technicians who are focused on helping you optimize repairs to keep machines productive. And we help with training to ensure your operators have the skills and knowledge they need to work as efficiently and productively as possible.

We also work alongside you to ensure you achieve maximum value throughout the life of your equipment. Together with our Cat dealer network, we customize service offerings to provide a maintenance solution that fits your operation—whether you want to perform the majority of service yourself, or you're looking for an onsite partner to manage your maintenance organization. We're also consultants who can help you make smart decisions about buying, operating, maintaining, repairing, rebuilding and replacing equipment.

# **TECHNICAL SPECIFICATIONS**

See cat.com for complete specifications.

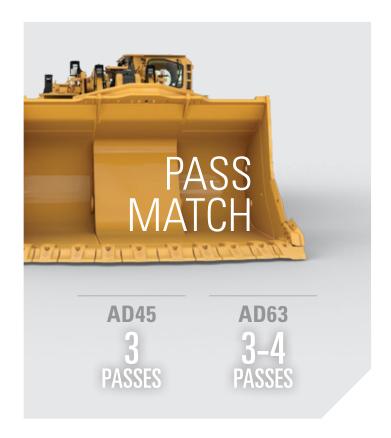
ENGINE		
Engine Model	Cat® C15	
Engine Power		
Stage V Engine – IS014396:2002	335 kW	449 hp
Tier 2 / Stage II Engine – ISO14396:2002	333 kW	447 hp
Bore	137 mm	5.39 in
Stroke	172 mm	6.77 in
Displacement	15.2 L	928 in <sup>3</sup>

	TRANSMISSION	
Transmission Type	Cat switched reluctance electric drive	
Forward – 1st (virtual)	5.8 km/h	3.6 mph
Forward – 2nd (virtual)	9.5 km/h	5.9 mph
Forward – 3rd (virtual)	17.0 km/h	10.6 mph
Forward – 4th (virtual)	24.6 km/h	15.3 mph
Forward – 5th (virtual)	33.4 km/h	20.8 mph
Reverse – 1st (virtual)	6.0 km/h	3.7 mph
Reverse – 2nd (virtual)	10.1 km/h	6.3 mph
Reverse – 3rd (virtual)	18.0 km/h	11.2 mph
Reverse – 4th (virtual)	26.0 km/h	16.2 mph
Reverse – 5th (virtual)	32.9 km/h	20.4 mph

OPERATING SPECIFICATIONS			
Rated Payload	18,500 kg	40,785 lb	
Gross Machine Mass – Loaded	78,089 kg	172,157 lb	
Shipping Weight (30% Fuel, No Operator)	59,869 kg	131,989 lb	
Static Tipping Load Straight Ahead, Lift Arms Horizontal	43,276 kg	95,407 lb	
Static Tipping Load Full Turn, Lift Arms Horizontal	37,598 kg	82,889 lb	
Break Out Force (Lift, calculated)	32,500 kg	71,500 lb	
Break Out Force (Tilt, calculated)	42,000 kg	92,500 lb	
Bucket Capacity Range	7.4 - 9.8 m <sup>3</sup>	9.7-12.8 yd <sup>3</sup>	

HYDRAULIC SYSTEM – LIFT/TILT			
Lift/Tilt System – Circuit	Electro Hydraulic Controls		
Lift/Tilt System – Pump	Variable displacement piston		
Maximum Flow	479 L/min	264 gal/min	
Relief Valve Setting – Main 31,700 kPa 4,597 p		4,597 psi	
Lift Cylinder – Bore 190 mm 7.5 ir		7.5 in	
Lift Cylinder – Stroke 1,011 mm 39.8 in			
Tilt Cylinder – Bore	270 mm	10.6 in	
Tilt Cylinder – Stroke	458 mm	18.0 in	

HYDRAULIC CYCLE TIMES		
Raise Time	9.2 seconds	
Dump Time	2.8 seconds	
Lower, empty, float down 3.5 seconds		
Total Cycle Time 15.3 seconds		



MACHINE DIMENSI	ONS	
Dump Bucket (STD)	7.4 m³	9.7 yd³
Bucket Width over Cutting Edge	3054 mm	120 in
Height – Max Bucket Raised	6560 mm	258 in
Height – Max Dump	5497 mm	216 in
Height – Max Lift Bucket Pin	4663 mm	184 in
Height – Dump Clearance at Max Lift	3016 mm	119 in
Height – Digging Depth	80 mm	3 in
Height – Ground Clearance	405 mm	16 in
Height – Top of Rear Guard	2291 mm	90 in
Height – Top of ROPS	2860 mm	113 in
Length – Overall (Digging)	11320 mm	446 in
Length – Overall (Tramming)	11033 mm	434 in
Length – Wheelbase	3780 mm	149 in
Length – Front Axle to Hitch	1890 mm	74 in
Length – Rear Axle to Bumper (with auxiliary lines)	3660 mm	144 in
Length – Reach	1652 mm	65 in
Width – Overall Tire	2938 mm	116 in
Width – Machine without Bucket	3028 mm	119 in
Width – Machine with Bucket	3090 mm	122 in
Recommended Clearance Width	4500 mm	177 in
Recommended Clearance Height	4500 mm	177 in
Outer Clearance Radius	7270 mm	286 in
Inner Turning Radius	3391 mm	134 in

# **STANDARD AND OPTIONAL EQUIPMENT**

Standard and optional equipment may vary. Consult your Cat dealer for details..

ELECTRICAL		
	Standard	Optional
12V Power Supply in Cab	Х	
Alternator, 150-amp	Х	
Auxiliary Start Receptacle	Х	
Battery Disconnect Switch, Ground Level	Х	
Diagnostic Connector	Х	
Electric Starting, 24V	Х	
E-stop (Illuminated)		
Rear Right Hand Side	Х	
Rear Left Hand Side	Х	
External LED Lighting System, Front, Rear, Stop – brake – Tail light dual LED		
Lighting – Loading		Х
Service Bay light		Х
Low Maintenance Batteries	Х	

OPERATOR ENVIRONMENT		
	Standard	Optional
Operator's Station, Enclosed ROPS/FOPS		
Air Conditioning	Х	
Cab Pressurizer and Filter	Х	
Cab Pressurizer and Filter (HEPA)		Х
Radio Ready Compartment for Radio and Speakers	Х	
Cup holder and storage compartments	Х	
Cat Multi Purpose Display (CMPD)	Х	
Cameras, Color Forward and Rear Facing		Х
Electric Horns	Х	
Guard, Rear Side Quarter Window	Х	
Dual Pane windows		Х
Operator Presence System (Auto Park Brake)	Х	
Door latch monitoring	Х	
Electro-Hydraulic Implement Controls, Single Joystick	Х	
Push Button Panel for Lights	Х	
Seats		
Suspension Seat Air, Vinyl	Х	
Suspension Seat Tee, Vinyl		х
Adjustable arm rest and knee pads	Х	
Seat Belt Monitoring	Х	
Retractable Seat Belt	Х	
STIC Steering	Х	
Secondary Steering	Х	
Reversible Steering		х
Return to Dig	Х	

POWER TRAIN		
	Standard	Optional
Cat C15 ATAAC Diesel Engine, 6-Cylinder	Х	
Engine Options		
Engine, EU Stage V		Х
Engine, U.S. EPA Tier 2 Equivalent	Х	
DPF (Flow Through)		х
Catalytic Exhaust Purifier/Muffler Group	Х	
Cat Switched Reluctance Electric Generator and Pump Drive	Х	
Cat Switched Reluctance Drive Motor	Х	
Cat Integrated Powered Electronics	Х	
Brakes, fully hydraulic enclosed wet multiple disc with cooling (SAFR)	х	
Fast Fill and SOS oil sample points		х

TECHNOLOGY		
	Standard	Optional
Traction Control		Х
Auto Dig		Х
Tire pressure monitoring		Х
Auto retarder with grade control	Х	
Command for Underground		Х
Payload Control System		Х
Remote Control Interface (excludes Transmitter and Receiver)		Х
Product Link™ Elite	Х	

OTHER EQUIPMENT		
	Standard	Optional
Remote recover hook and bar		Х
Tire Arrangements	Х	
Tire, 29.5 × R29 **2 VSMS2 L5S L2A Bridg	jestone	
Tire, 29.5 × R29**2 VMDL L5 L2A Bridgest	tone	
Bucket, various Sizes, Dump (7.4 m³ to 9.8 m³)		х
GET and wear package options		Х
Centralised or Auto Lube systems		Х
Flat fold handrails	Х	
Wheel chocks		Х
Rear protection – Bat Wings		Х



# R29111 E LOADER

For more complete information on Cat products, dealer services and industry solutions, visit us at www.cat.com

Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Cat dealer for available options.

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