


# CAT® UNDERGROUND

HARD ROCK MINING

UNDERGROUND  
CHALLENGES.

INNOVATIVE  
SOLUTIONS.





Underground hard rock mining presents special challenges when it comes to safe, efficient, productive operation — from environmental concerns and rising costs to communications and connectivity challenges. Even simple logistical issues become harder to manage as you dig deeper underground in search of new reserves.

But you want to do more than address these challenges. You want to work harder and turn those challenges into opportunities to improve.

At Caterpillar, we feel the same way. We're committed to listening to your challenges and collaborating with you to find new ways to improve the way you mine. From increasing productivity and reducing emissions to lowering operating costs and reducing maintenance and more, Cat® hard rock underground trucks and loaders are designed to help you meet your challenges head-on.

But we never stop looking for new ways to innovate and optimize.

We continually improve our products and seek out new ways of mining, new ways to reduce impact, and new ways to get more out of game-changers like technology and automation.

## UNDERGROUND CHALLENGES. INNOVATIVE SOLUTIONS.

No matter what you mine — or how far underground you mine it — you need an equipment provider that understands the unique problems you face, and that has years of experience in solving them. You need a partner like Caterpillar.



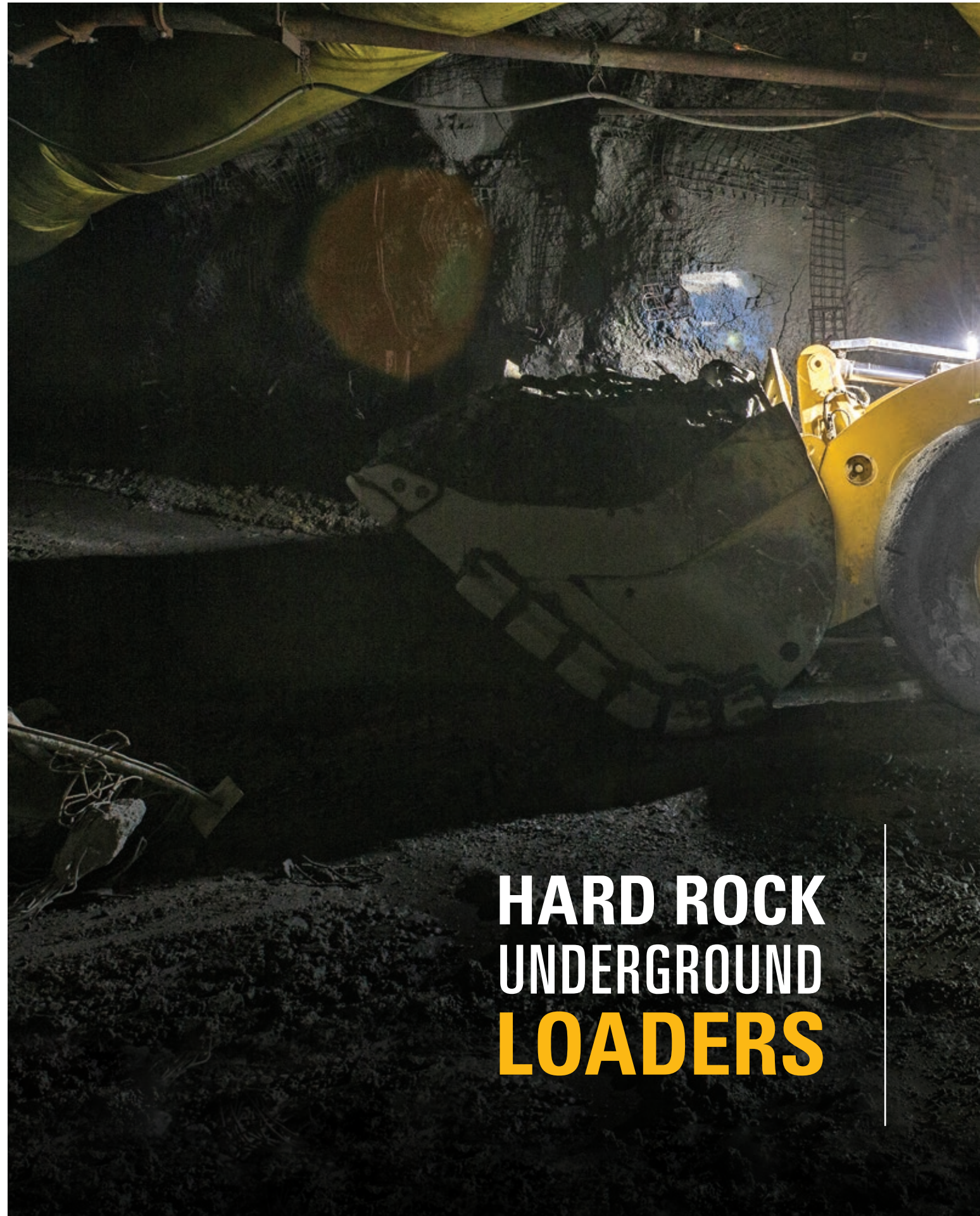
## INNOVATIVE MACHINES FOR OPTIMIZED UNDERGROUND MINING

Cat underground loaders and trucks stand the test of time in a wide range of difficult conditions while also incorporating our latest innovations. In addition to providing products that help you meet your production goals, we're focused on safety innovations and reduced and zero-exhaust-emission technologies for our underground mining products.



## A FOCUS ON QUALITY

Cat underground hard rock loaders and trucks are designed in Burnie, Tasmania, Australia, and manufactured in Rayong, Thailand. Burnie is home to the Caterpillar Burnie Proving Ground, which features a complete underground autonomy testing facility and training and demonstration center. The Caterpillar factory in Rayong is one of the newest Caterpillar manufacturing facilities and is 100% dedicated to underground hard rock mining products. The facility was designed and built by Caterpillar and is managed by a highly skilled and diverse team that has embedded the Cat Production System into its culture.



# HARD ROCK UNDERGROUND LOADERS



To keep material moving underground, you need a quick, precise method of loading material. Cat underground loaders have the necessary strength and durability to work in tough conditions, but it's their precise controls and efficient operation that set them apart. The power shift transmission delivers smooth, responsive tramming performance for new industry standards in comfort and efficiency.

POWERFUL  
PERFORMANCE IN A  
COMPACT PACKAGE

# R1300G



### R1300G

The R1300G is our smallest LHD, but with a breakout force of 12 020 kg (26504 lb) and 117 kW (157hp) of engine power, it brings maximum production capability to smaller mines. An operator favorite, the R1300G features excellent loaded weight distribution, ride control and seat suspension for maximum comfort. To raise the bar on air quality in your mine, you can equip your R1300G with an optional diesel particulate filter.

### NOMINAL PAYLOAD CAPACITY

6 800 kg (14,991 lb)

### GROSS MACHINE MASS

29 702 kg (65,482 lb)

### BUCKET CAPACITIES

2.5-3.4 m<sup>3</sup> (3.2-4.4 yd<sup>3</sup>)

### ENGINE MODEL

Cat® 3306B DITA

### ENGINE POWER @ 2,200 RPM –

ISO 14396:2002

117 kW (157 hp)



FASTER.  
SAFER.  
SMARTER.

# R1600H





### R1600H

The R1600H has a powertrain tuned specifically for speed on grade—mastering poor floor conditions and delivering maximum production in all speed ranges. The loader offers a number of safety features, from fire suppression and safety glass to the ability to incorporate autonomous operation. Thanks to the extreme durability designed into the structure, the R1600H can be productive through up to four rebuilds. The R1600H is an ideal match for the Cat AD30 truck.

### NOMINAL PAYLOAD CAPACITY

10 200 kg (22,487 lb)

### GROSS MACHINE MASS

44 204 kg (97,453 lb)

### BUCKET CAPACITIES

4.2-5.9 m<sup>3</sup> (5.5-7.7 yd<sup>3</sup>)

### ENGINE MODEL

Cat C11

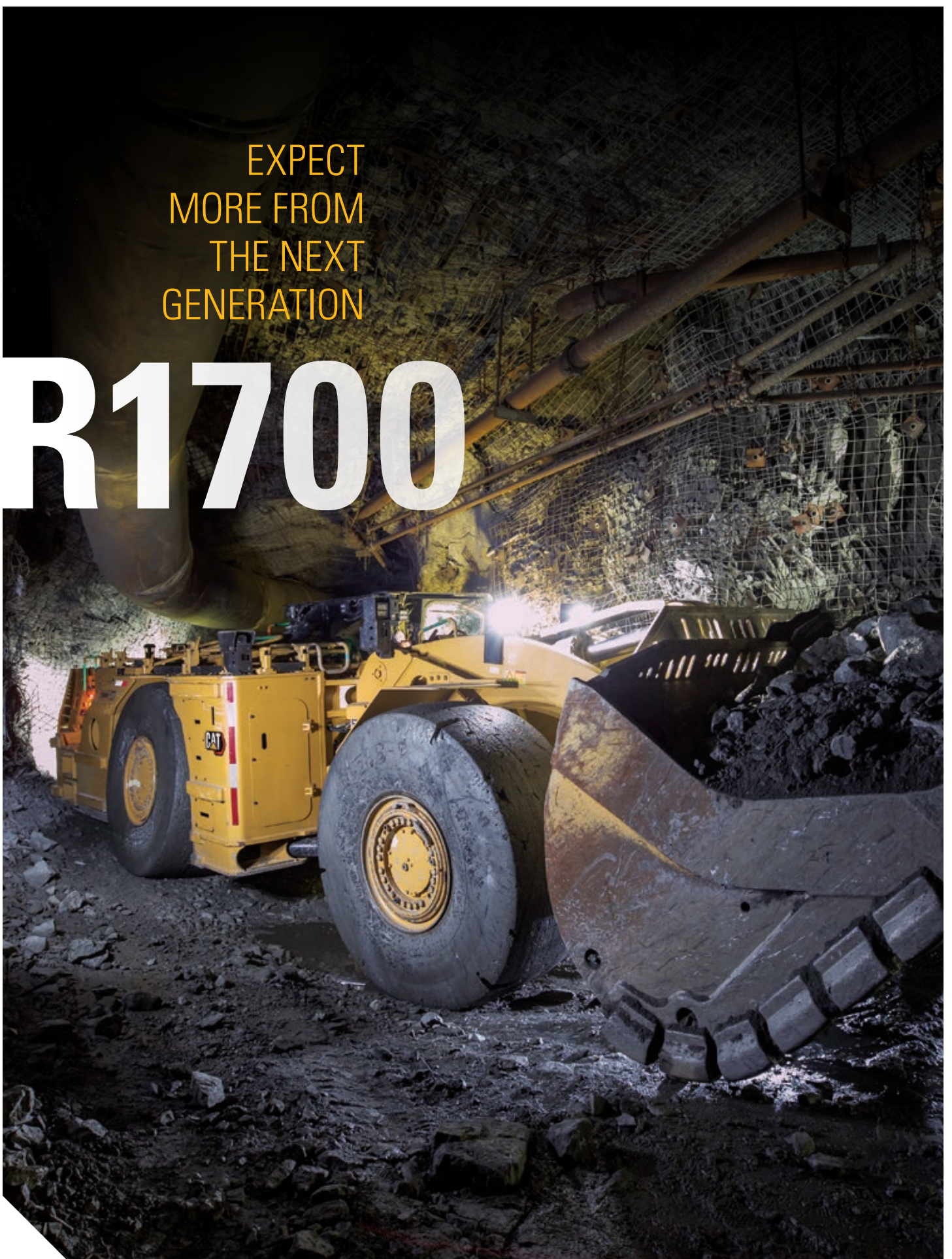
### ENGINE POWER @ 1,800 RPM – ISO 14396:2002

Tier 3 Engine – 202 kW (271 hp)



EXPECT  
MORE FROM  
THE NEXT  
GENERATION

# R1700



## R1700

A clean-sheet redesign, the R1700 loader leverages engineering talent from across Caterpillar to bring new levels of productivity, operator comfort and service convenience to your operation. The R1700 is Stage V emissions capable and factory-ready for a full suite of technology solutions. It carries 20% more material with each pass and is highly aggressive in the pile. Ten bucket options, including ejector and bolt-together buckets, are available to suit unique mining applications.

### NOMINAL PAYLOAD CAPACITY

15 000 kg (33,069 lb)

### GROSS MACHINE MASS (LOADED)

62 739 kg (138,316 lb)

### BUCKET CAPACITIES

5.7-8.6 m<sup>3</sup> (7.5-11.2 yd<sup>3</sup>)

### ENGINE MODEL

Cat C13

### ENGINE POWER @ 2,050 RPM – ISO 14396:2002

EU Stage V Engine – 257 kW (345 hp)



SUPERIOR  
PRODUCTIVITY.  
ZERO EXHAUST  
EMISSIONS.

# R1700 XE

BATTERY ELECTRIC



### **R1700 XE**

The R1700 XE is a high productivity, zero-exhaust-emission loader with the industry's only onboard battery. It provides an alternative to expensive static charging station infrastructure, the need for additional batteries, and battery handling and swapping. It charges quickly—in less than 20 minutes when paired with two of the durable and mobile Cat MEC500 chargers. It features Autodig for optimized loading and is factory-ready for autonomous operation. And it delivers the powerful performance, maximum uptime and low operating costs you demand.

#### **NOMINAL PAYLOAD CAPACITY**

15,000 kg (33,069 lb)

#### **GROSS MACHINE MASS**

63 743 kg (140,500 lb)

#### **BUCKET CAPACITIES**

5.7 - 7.5 m<sup>3</sup> (7.5 - 9.8 yd<sup>3</sup>)

#### **RUNTIME**

2.5 hr





# R2900G

ENGINEERED FOR PERFORMANCE.  
DESIGNED FOR COMFORT.  
BUILT TO LAST.

## R2900G

The Cat R2900G underground loader is designed for high-production, low cost-per-ton loading and tramming in underground mining applications. An operator favorite, it delivers a safe, comfortable ride in a cab equipped with easy-to-use controls and efficiency-boosting features that optimize performance and maximize productivity. Its compact design provides agile performance combined with rugged construction and simplified maintenance to ensure excellent productivity, long life and low operating costs.

### NOMINAL PAYLOAD CAPACITY

17 200 kg (37,920 lb)

### GROSS MACHINE MASS

70 350 kg (155,095 lb)

### BUCKET CAPACITIES

6.3-8.9 m<sup>3</sup> (8.2-11.6 yd<sup>3</sup>)

### ENGINE MODEL

Cat C15

### ENGINE POWER @ 2,000 RPM – ISO 14396:2002

299 kW (401 hp)



CLEANER. FASTER.  
MORE POWERFUL.

# R2900 XE

DIESEL ELECTRIC





### **R2900 XE**

The R2900 XE was built from the ground up for increased production. Its 18.5-tonne (20.4-ton) payload allows it to load Cat AD63 trucks in 3 to 4 passes for maximum throughput. Faster acceleration, instant machine response and higher speed on grade make for shorter cycle times, while greater breakout force and higher lifting height make digging and loading faster than ever.

### **NOMINAL PAYLOAD CAPACITY**

18 500 kg (40785 lb)

### **GROSS MACHINE MASS**

78 089 kg (172,157 lb)

### **BUCKET CAPACITY**

7.4-9.8 m<sup>3</sup> (9.7-12.8 yd<sup>3</sup>)

### **ENGINE MODEL**

Cat C15

### **ENGINE POWER @ 1600 RPM –**

**ISO 14396:2002**

EU Stage V Engine – 335 kW (449 hp)



SUPER PRODUCTIVE  
AND BUILT TO LAST

# R3000H



### R3000H

Designed for the largest underground mines, the R3000H is an updated, super-productive 20-tonne (22-ton) machine that specializes in lowering costs. Most of the latest Cat safety features come standard on this machine, including the operator presence system. With its 100% Cat powertrain, performance, long-term durability and ease of maintenance are built in.

### NOMINAL PAYLOAD CAPACITY

20 000 kg (44,092 lb)

### GROSS MACHINE MASS

82 000 kg (180,779 lb)

### BUCKET CAPACITIES

8.9-11.6 m<sup>3</sup> (11.6-15.2 yd<sup>3</sup>)

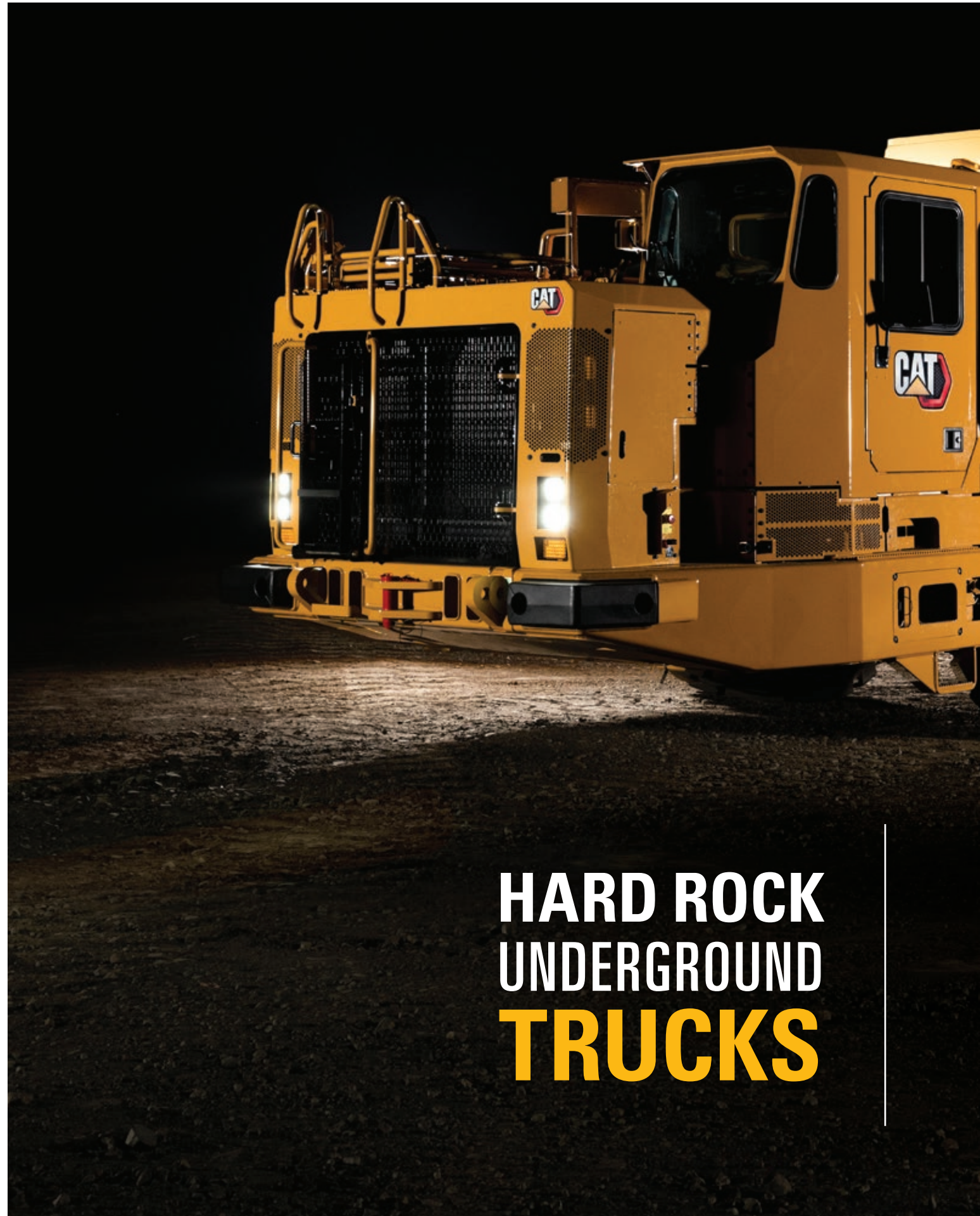
### ENGINE MODEL

Cat C15

### ENGINE POWER @ 1,800 RPM – ISO 14396:2002

Tier 3 Engine –299 kW (401 hp)





# HARD ROCK UNDERGROUND TRUCKS



Hard rock operations require a truck that can operate in confined spaces without sacrificing efficiency, capacity or operator comfort.

With a fuel-efficient engine and the most durable components in the industry, Cat underground trucks offer a reliable haulage solution and a low cost per ton. They also offer payload capacities up to 63 tonnes (69 tons), to keep up with the production requirements of even the largest underground operations.

CONSISTENT  
PERFORMER  
IN A LIMITED  
ENVELOPE

# AD30



### AD30

Ideally suited to entry sizes of 4 × 4 meters (13 x 13 feet), the AD30 is a medium to smaller mine hauler that is perfectly matched to the R1600H LHD. This proven and recognized industry leader is engineered for performance. Its Cat C15 engine provides unequaled lugging force while traversing steep grades. Torque rise effectively matches transmission shift points for maximum efficiency and fast cycle times. The cab is ergonomically designed for all-day comfort, control and productivity. Rugged construction and easy maintenance guarantee long life with low operating costs.

#### NOMINAL PAYLOAD CAPACITY

30 000 kg (66,139 lb)

#### GROSS MACHINE MASS

60 000 kg (132,300 lb)

#### BODY CAPACITIES

11.3-17.5 m<sup>3</sup> (14.8-22.9 yd<sup>3</sup>)

#### ENGINE MODEL

Cat C15

#### ENGINE POWER @ 1,800 RPM – ISO 14396:2002

Tier 3 Engine – 299 kW (401 hp)



# AD45

CLEANER,  
MORE RELIABLE  
PERFORMANCE





## AD45

Based on the proven performance of the AD45B, the AD45 underground articulated truck is powered by the Cat C18 engine, with scalable solutions to meet emission regulations, including the industry's strictest — EU Stage V.

A perfect match for the flagship Cat R1700 loader, the AD45 delivers proven operating efficiency and improved serviceability. The truck can be fitted with Payload Measurement System (TPMS), and the new Product Link™ Elite (PLE) system is a standard feature.

### NOMINAL PAYLOAD CAPACITY

45 000 kg (99,208 lb)

### GROSS MACHINE MASS

89 250 kg (196,765 lb)

### BODY CAPACITIES

18.0-25.1 m<sup>3</sup> (23.6-32.8 yd<sup>3</sup>)

### ENGINE MODEL

Cat C18

### ENGINE POWER @ 2,000 RPM – ISO 14396:2002

EU Stage V Engine – 446 kW (598 hp)



MORE PAYLOAD.  
MORE POWER.  
MORE PROFITABILITY.

# AD63



### AD63

With 5% greater payload and more torque, the AD63 underground truck delivers more production than its predecessor.

The AD63 is powered by the Cat C27 engine, which offers the perfect balance between power, robust design and economy. In addition, the C27 meets the strictest nonroad emission standards (EU Stage V) and is approved by CANMET for use in underground mines.

Five body sizes, including a new lightweight dump body, ensure optimal performance and reliability in tough mining applications. The truck can be fitted with Payload Measurement System (TPMS), and the new Product Link Elite (PLE) system is a standard feature.

### NOMINAL PAYLOAD CAPACITY

63 000 kg (138,891 lb)

### GROSS MACHINE MASS

118 940 kg (262,218 lb)

### BODY CAPACITIES

26.9-38.3 m<sup>3</sup> (35.2-50.1 yd<sup>3</sup>)

### ENGINE MODEL

Cat C27

### ENGINE POWER @ 1,800 RPM – ISO 14396:2002

Stage V Engine – 593 kW (795 hp)



# THE RIGHT OPTIONS FOR THE JOB

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## TRUCK BODY SYSTEMS

Selection of the right body depends on material, haul road, and dump conditions. The better the match of body to application, the greater the efficiency. Your Cat dealer can help you select the right body size and system for your specific application.

Caterpillar offers two specific body styles — a dump body and an ejector body — for the most efficient hauling solutions at the lowest cost per ton.

Cat truck bodies are designed for optimal strength, capacity and durability. Drawing on years of experience in truck body design, Cat truck bodies are designed for long service life and low cost per ton. They're designed and matched with the integrated chassis system for optimum structural reliability, durability and long life.

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## TRUCK PAYLOAD MANAGEMENT SYSTEM (TPMS)

The optional TPMS system calculates the payload the truck is carrying and determines truck cycle times. It now offers digital payload scoreboards on both sides of the truck providing the LHD operator with visual real time payload data.



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## DURABLE CAT BUCKETS

Cat underground loader buckets deliver unmatched productivity and structural reliability to help lower your cost-per-ton. Our bucket design is also improved with the use of two types of cast corners to help strengthen the side plate to bucket lip joint as well as allowing for various cutting edges.

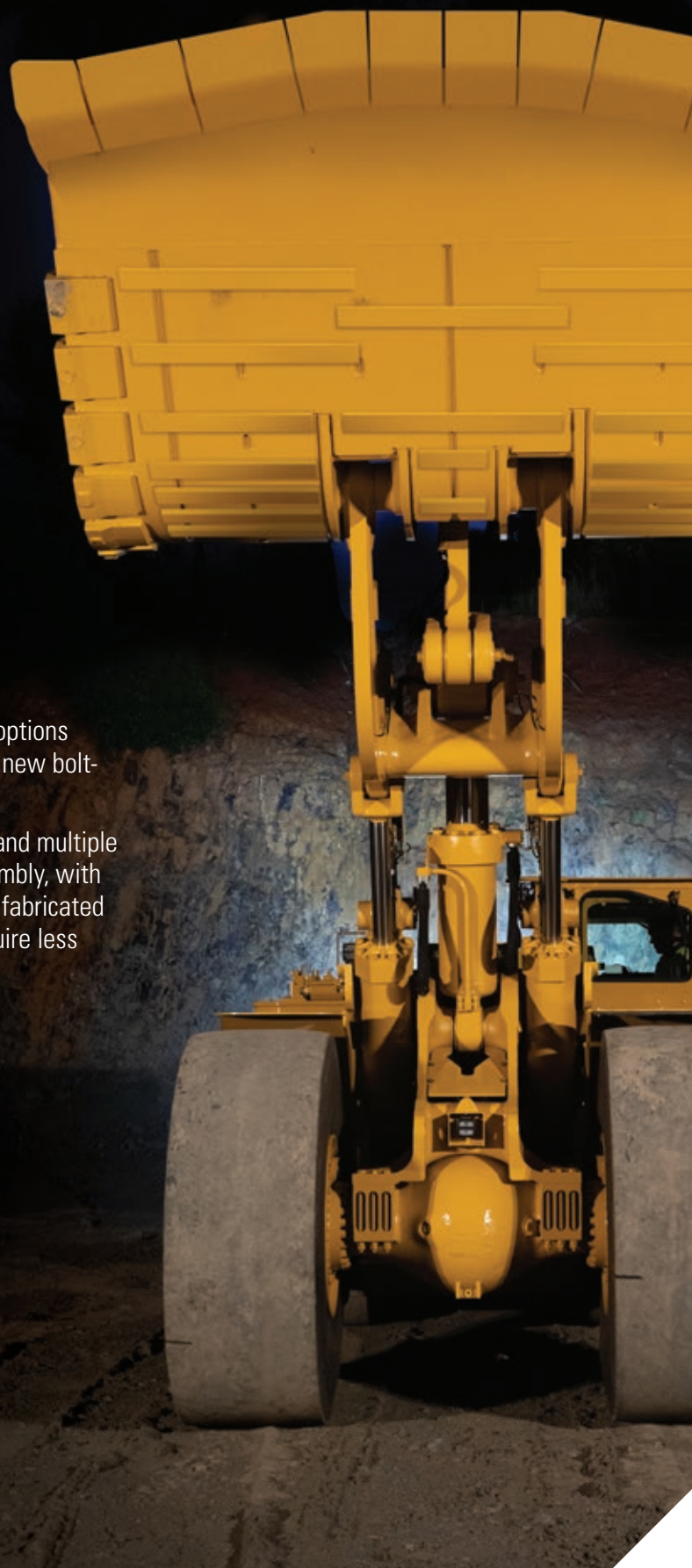
Buckets are available in a range of sizes to suit material types and densities, with multiple options including dump buckets, ejector buckets and the new bolt-together bucket.

Bolt-together buckets feature a modular design and multiple components for ease of transportation and assembly, with no underground welding required. Designed and fabricated for abrasive materials, they deliver long life, require less maintenance and reduce overall costs.

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## OPTIONAL AUTODIG FEATURE

Some Cat underground loaders can be equipped with Autodig, an autonomous digging and bucket loading function that helps new operators be productive on the first day and reduces fatigue for experienced operators. This function also enables autonomous haulage through MineStar™ Command for underground.





FLEXIBLE & RELIABLE

# GROUND ENGAGING TOOLS

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Caterpillar offers a number of Ground Engaging Tool (GET) options for the underground loaders, so you can customize your machine to meet your site-specific needs and fit with your overall maintenance strategy. Whether you choose welded, bolted or hammerless, Cat GET helps you achieve the productivity and the bucket life you desire. In addition, Cat Bucket Pro can help you manage GET performance and optimize bucket lifecycle costs. All Cat GET are built for strength and long life, so you spend less time replacing shrouds.

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## BOLT-ON HALF ARROW GROUND ENGAGING TOOLS

For the entire underground loader line, Caterpillar now offers Bolt On Half Arrow ground engaging tools (GET) for bucket edges. The system is designed for high abrasion applications where weld-on GET experience high wear rates. With a proven and reliable retention system, the bolt-on GET offer more wear material than standard weld-on GET, and the bolt-on design enables fast and easy removal and replacement. Despite additional wear material, the low-profile front edge eases pile penetration and promotes fast bucket loading.

BOHA GET can reduce changeout times while extending the life of traditional weld-on GET option. 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.

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## CAT MODULAR SEGMENT WELDED GET SYSTEM

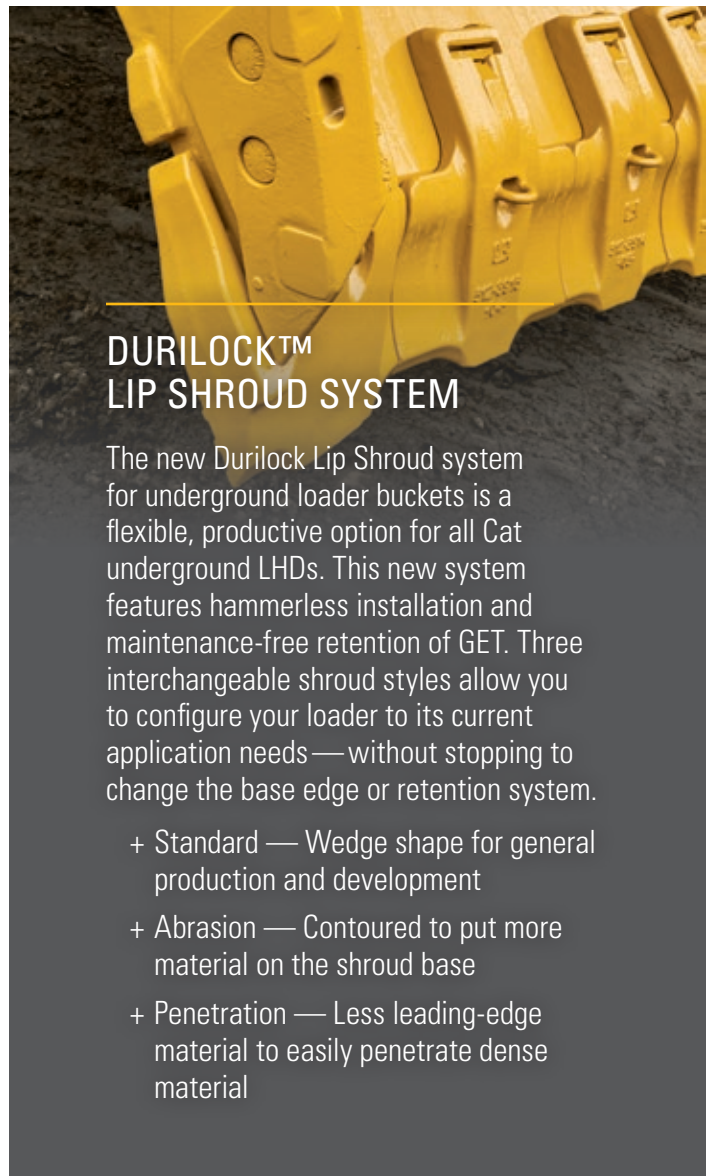
Modular shrouds deliver welded part reliability with the replacement simplicity of a mechanical system. Integrated bevel allows for faster weld installation time — 20% faster than competitive shroud systems — and creates an 18% stronger modular shroud assembly by locking segments together. Wear indicators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

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## 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



# PARTNERS BEYOND THE IRON

Caterpillar offers a breadth of machines for underground mining. But the power of Caterpillar is more than iron. It's our technologies, which are helping mines optimize their operations, improve the way they manage equipment health and keep people safe. It's the end-to-end services we provide, like power, rail and financing. It's our knowledge and expertise, which we leverage to create a unique mix of solutions to meet site-specific needs. And it's the unparalleled support that Caterpillar and Cat dealers provide after our machines go to work.







## TAKE TECHNOLOGY UNDERGROUND

It's no secret that underground mining presents special challenges when it comes to safe, efficient operation. That's why we tailor Cat MineStar™ Solutions to the unique needs of your environment.

MineStar is the mining industry's most comprehensive and thoroughly integrated suite of technology offerings. No matter the size, type or complexity of your underground operation, MineStar can help you deal with the challenges you face every day: Controlling costs. Extending equipment life. Working more productively. And keeping people safe.

Run your LHDs remotely

**WITH 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.



Get essential operational information

**WITH 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 and other key operational parameters and automatically records and tracks data up and down the value chain.



Address risks to people and assets

**WITH 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 — wherever they are underground — in real time and with no reliance on mine infrastructure. It provides operators continuous awareness of their surroundings to sub-meter accuracy, along with the location and status of all personnel and assets.

Make informed decisions and optimize your maintenance strategy

**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.



# MAXIMIZE THE VALUE OF YOUR EQUIPMENT

Your journey with a piece of Cat equipment begins when you decide to make the purchase. But that's just the first of many decisions you'll need to make throughout its lifecycle.





Caterpillar and Cat dealers offer dozens of equipment management services that help you take care of your machine after it goes to work — from individual offerings that augment your own capabilities to comprehensive solutions that allow you to outsource the management of your fleet.

Together with Cat dealers, we go beyond supporting individual products to focus on complete operations:

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- + Providing services that ensure you have machines available when you need them.
- + Helping you better understand how to optimize equipment performance and maximize its life.
- + Leveraging equipment health data and sophisticated analytics to enable a preventive approach to maintenance.
- + Helping you make smart decisions about buying, operating, maintaining, repairing, rebuilding and replacing equipment.
- + Helping you choose the right repair option at the right time in the equipment lifecycle to keep machines on the job.



# GLOBAL — CAT DEALER — NETWORK

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 its complete lifecycle.

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



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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.

Together with our dealers, we help you employ a philosophy of preventive maintenance, proactively taking care of parts and components so they last as long as possible. Dealers leverage information gained from machine health systems, preventive maintenance programs and other initiatives to predict maintenance and repair needs and anticipate the parts and components that will be required.

Caterpillar and Cat dealer personnel will partner with you on site to improve the performance of your machines as well as your overall 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.

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.

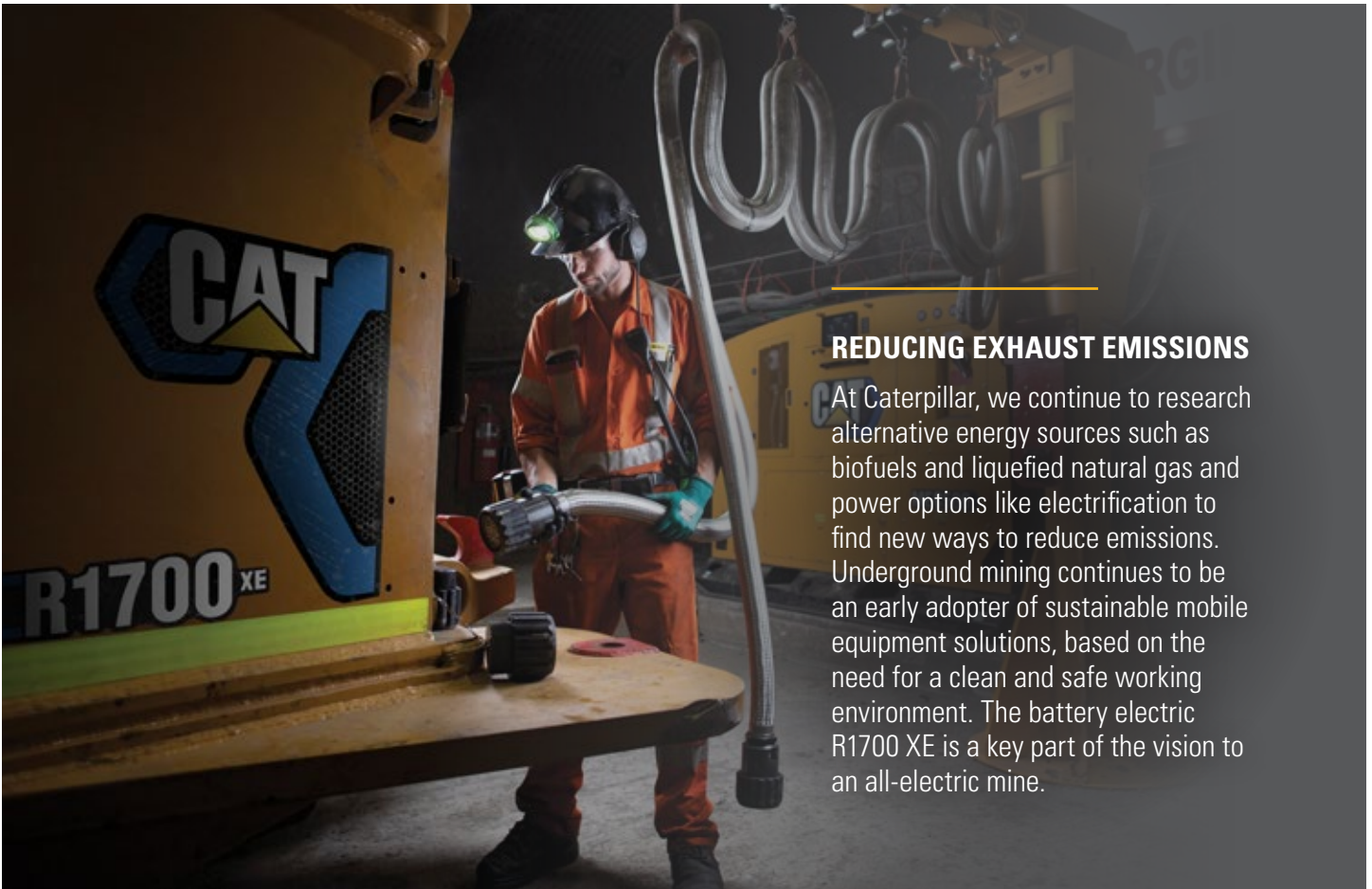


# MINING — FOR A — **BETTER WORLD**

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.







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## REDUCING EXHAUST EMISSIONS

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. Underground mining continues to be an early adopter of sustainable mobile equipment solutions, based on the need for a clean and safe working environment. The battery electric R1700 XE is a key part of the vision to an all-electric mine.



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## REBUILDING, REMANUFACTURING AND REUSING

We rebuild and remanufacture parts, components and complete machines to increase the lifespan of equipment — reusing instead of discarding, conserving energy, reducing waste, keeping nonrenewable resources in circulation for multiple lifetimes and minimizing the need for new raw materials. We're also listening to our customers and investigating ways we can help them in their efforts to recycle end-of-life machines and components.

Retrofits and upgrades enhance and improve older machines to incorporate efficiency improvements and emission reductions, and to keep them in production longer to conserve energy, lower emissions and minimize the need for raw materials.

# TRUCK LOADING

The trucks and loaders that make up your loading and hauling system must match each other's capabilities and be suited for the specific characteristics of your mine and the demands of the operation. The comprehensive lineup of Cat underground trucks and loaders are ideally matched to help you achieve optimal hauling system performance.





**R1300G**

3.0 w × 2.8 h

3306B @  
117 kW (157 hp)

6800 kg  
(14,991 lb)



**R1600H**

3.5 w × 3.0 h

C11 @  
202 kW (271 hp)

10 200 kg  
(22,487 lb)



**R1700**

4.0 w × 4.0 h

C13 @  
257 kW (345 hp)

15 000 kg  
(33,069 lb)



**R1700 XE**

4.0 w × 4.0 h

Battery  
Electric

15 000 kg  
(33,069 lb)



**R2900G**

4.5 w × 4.5 h

C15 @  
299 kW (401 hp)

17 200 kg  
(37,920 lb)



**R2900 XE**

4.5 w × 4.5 h

C15 @  
335 kW (449 hp)

18 500 kg  
(40,785 lb)



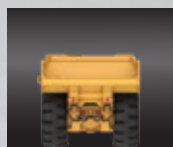
**R3000H**

5.0 w × 4.5 h

C15 @  
299 kW (401 hp)

20 000 kg  
(44,092 lb)

## MODEL VS DRIVE SIZES



**AD30**

4.0 w × 4.0 h

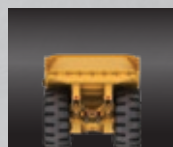
C15 @  
299 kW (401 hp)

Dump  
Body

30 000 kg  
(66,138 lb)

Ejector  
Body

27 000 kg  
(59,525 lb)



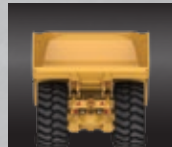
**AD45**

4.5 w × 4.5 h

C18 @  
446 kW (598 hp)

45 000 kg  
(99,208 lb)

40 000 kg  
(88,185 lb)



**AD63**

5.0 w × 5.0 h

C27 @  
593 kW (795 hp)

63 000 kg  
(138,891 lb)



# HARD ROCK MINING

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

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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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