



# Cat<sup>®</sup> R1700 XE

## Underground Battery-Electric LHD Loader

*The Cat<sup>®</sup> R1700 XE 15-tonne (16.5 ton) payload battery electric LHD is designed to deliver superior productivity, with the benefits of no engine heat or exhaust emissions. With key performance metrics matching R1700 diesel LHD, the R1700 XE features fast charging by means of the MEC500 mobile equipment charger with stringent safety features.*

### Greater Operator Safety, Comfort and Control

#### Operator Safety

- Integral to the cab and frame, the Rollover Protective Structure (ROPS) and the Falling Objects Protective Structure (FOPS), are resiliently mounted to the frame to isolate the operator from vibration for a more comfortable ride.
- Operator Presence system using machine sensors, including the door sensor.
- Tire pressure monitoring system.
- All new HVAC coverage with improved airflow, greater defrosting coverage, and reduced noise levels.
- Neutral creep inhibitor – machine has neutral coast and neutral creep safety features.
- Dual secondary emergency exits.
- Seat belt monitoring systems available.
- Door Latch Sensor warns of partially closed door.

#### Operator Comfort

- Cab pressurization to keep dust out.
- Optional dual pane windows further reduce noise and improve temperature control in extreme ambient conditions.
- Climate control standard.
- Adjustable padding for the operator's knees; adjustable arm rest.
- Ride control option with electronic cylinder snubbing.

#### Operator Control

- The operator station is ergonomically designed for total machine control.
- STIC™ Steering and Transmission Integrated Control – provides maximum responsiveness and control that combines directional selection, virtual gears and steering into a single lever.
- Low-effort electrically operated joystick controls implement functions for smoother, faster cycles with less operator fatigue.
- Auto retarding for control and confidence on long downhill hauls.
- Optional rear and side view cameras, enhancing the operator's visibility.
- Auto lights high and low beam, auto directional switching, auto boom lights on and off functions.

### Zero Emissions

- 100% Battery Electric Propulsion, zero emissions and significantly less heat generation.
- Over 400 Caterpillar electrification patents leveraged in the design.

### Priority on Production

- Class leading productivity, performance matching R1700.
- 15 metric tonne (33,069 lb) truck loading and tramping capability and software controlled maximum speed, tailored to the needs of the application, to optimize battery life and run time.
- Power train carryover features such as traction control, proportional braking, axles, shaft, final drives, dropbox (same gears) to improve component durability, reliability and reduce overall operating cost, while maximizing availability and productivity.
- Front linkage geometry is the same as the R1700 for strong breakout force.
- Robust chassis designs for long term durability.
- Aggressive hydraulic performance for improved loading times and common implement control and load sensing pumps with controllable flow.
- Five bucket sizes available to match your material density and meet a range of loading, hauling and dumping conditions.
- Full range of Cat Ground Engaging Tools (GET) offering to achieve best productivity while maximizing bucket life.



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## Safety Features

- Multi Layered Electrical Safety Systems, designed to withstand the rigors of underground mining environments.
- R1700 XE leverages 15 years of experience in Cat electric drive. Utilize existing, proven electric drive components, inclusive of motor and inverters from various Cat Product lines as well as leverage the output gearing from the R1700.
- Reliable, field proven braking system.
- Electrical and Electronics – maintain upgrades introduced in R1700 whilst allowing for new electric drive requirements.
- Minimal new hydraulic and lube systems, new routings for electric drive.
- Fire suppression system available to prevent oil fire cascading into adjacent systems, fire suppression activation from within the cab.

## Powerful Battery

- Tried and tested thermally stable Lithium Iron Phosphate battery system for fast charge, high performance, and improved safety.
- Caterpillar engineered cooling system to maximize performance and cell life.
- Parallel Boxes for safe operation.
- Maintenance free, tested integrated battery storage boxes.

## Fast Charging

- Batteries stay on the machine which maximizes available runtime and reduces capital expenditure and operating cost. No need for spare batteries, no need for development of dedicated charging bays.
- The Portable MEC500 Mobile Equipment Charger utilizes components from Cat Gensets and Microgrid applications.
- Two MEC500 chargers in parallel to achieve less than 20 minutes full charge or less than 30 minutes with a single MEC500.
- Charge wherever the work is: MEC500 can be towed or forklifted and is with 15-meter ground-fault protected cable.
- Monitoring while charging; battery cooling while charging; opportunity charging; with each full charge, targeting 2.5 hours of aggressive runtime.
- Optional skid mount and lift eyes available.

## Durability and Serviceability

- The Cat R1700 XE has strong commonality with the R1700, enabling an upgrade path for the future.
- Being a battery machine, the R1700 XE has less parts. The benefits include reduced maintenance and parts inventory requirements.
- Electrical connectors are sealed to lock out dust and moisture. Harnesses are covered for protection. Wires are color and number coded for easy diagnosis and repair.
- Smaller cooling package space claim, new chilling cores for battery cooling.
- Cat hoses throughout machine – durable and reliable.
- Cat Electronic Technician (Cat ET) service tool enables quick electronic diagnosis of machine performance and key diagnostic data for effective maintenance and repairs.

## The Latest Technology Delivers Optimum Productivity and Efficiency

- Cat Minestar™ for Underground Technology ready.
- Autodig function to optimize loading and traction control to maximize tire life.
- Product Link™ Elite (PLE) system for machine health monitoring.
- Scalable levels of remote operation from Line of Sight (LOS) through to full automation.

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## Standard and Optional Equipment

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

	Standard	Optional		Standard	Optional
<b>POWER TRAIN</b>			<b>OPERATOR ENVIRONMENT (continued)</b>		
Brake axle cooling	✓		Electrohydraulic implement controls (single joystick)	✓	
Brakes, full hydraulic enclosed wet multiple-disc (SAFR)	✓		Seat belt, retractable	✓	
Machine Power Source:			Mounts, radio and speaker (×2)	✓	
– Battery	✓		Storage box, enclosed, 5 L (3 gal)	✓	
– Two independently controlled motors for propulsion and hydraulics	✓		Armrests and kneepads, independently adjustable	✓	
Reversible hydraulic steering lines		✓	Color rear view camera		✓
Fast fill and evacuation of fluids (Power train and Hydraulic)		✓	<b>TIRES, RIMS, AND WHEELS</b>		
<b>ELECTRICAL</b>			Tires	✓	
Alarm, reversing	✓		Rims (set of four):		
Alternate implement control functions		✓	– Five piece	✓	
DC-DC convertor, 8 Amp	✓		Spare rim		✓
24V Battery disconnect switch, ground level	✓		<b>TECHNOLOGY</b>		
24 V Battery isolation switch in the cab		✓	Traction control	✓	
24V Batteries, low maintenance	✓		Cat Auto Dig		✓
HV indication lamp	✓		Ride control		✓
HV battery disconnect switch	✓		Tire Pressure Monitoring		✓
Diagnostic connector	✓		Cat payload monitoring		✓
Lighting, external, front, rear (LED)	✓		Product Link™ Elite System	✓	
Lighting, stop, dual (LED)	✓		Product Link Elite with WiFi*		✓
Receptacle, auxiliary start	✓		Cat line of sight remote receiver for the machine		✓
<b>OPERATOR ENVIRONMENT</b>			Cat line of sight remote console (over the shoulder design)*		✓
Enclosed Cab, ROPS/FOPS certified	✓		Wireless communications control group		✓
Color Multi Purpose Display (CMPD):			*Confirm regional availability with your Cat dealer.		
– Front and rear brake gauges	✓		<b>OTHER EQUIPMENT</b>		
– System diagnostics	✓		Autolube		✓
– Residual brake warning	✓		Ansul fire suppression – wet 37 L (9.8 gal)		✓
Horns, electric	✓		Bolt-on, brake release recovery bar or hook		✓
Instrumentation/gauges:			Dump bucket	✓	
– Speedometer/tachometer	✓		Bolt Together bucket		✓
– Battery SOC (State of Charge) level	✓		Bolt-on bucket lips		✓
– Hydraulic oil temperature	✓		Lift arm positioner for return to dig	✓	
– Battery and PTO coolant temperature	✓		Service bay light		✓
Operator presence system	✓		Truck loading light		✓
Automatic Brake Application (ABA)	✓		<b>CHOOSE BETWEEN:</b>		
Light, warning, residual brake	✓		Cab:		
Monitor, door latch	✓		1. Standard height		
			2. Raised height		

Not all features are available in all regions. Please check with your local Cat dealer for specific offering availability in your area. For additional information, refer to the Technical Specifications brochure available at [www.cat.com](http://www.cat.com) or your Cat dealer.

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## Technical Specifications

### Operating Specifications

Rated Payload	15 000 kg	33,069 lb
Operating Mass	48 743 kg	107,460 lb
Shipping Weight	51 918 kg	114,460 lb
Static Tipping Load Straight Ahead, Lift Arms Horizontal (calculated)	49 203 kg	108,500 lb
Static Tipping Load Full Turn, Lift Arms Horizontal (calculated)	40 649 kg	89,600 lb
Break Out Force (lift and tilt)	24 190 kg	53,330 lb
Ride Control	Yes	
Bucket Capacity Range	5.7–7.5 m <sup>3</sup>	7.5–9.8 yd <sup>3</sup>

### Hydraulic System Lift/Tilt

Lift/Tilt System – Circuit	Electro – Hydraulic, Positive Flow Control, Flow Sharing	
Lift/Tilt System – Pump	Variable Flow Piston/ Hydraulic Load Sense	
Maximum Flow	297 L/min	78.5 gal/min
Relief Valve Setting – Main	34 000 kPa	4,932 psi
Lift Cylinder – Bore	170 mm	7 in
Lift Cylinder – Stroke	830 mm	33 in
Tilt Cylinder – Bore	210 mm	8 in
Tilt Cylinder – Stroke	564 mm	22 in

### Hydraulic Cycle Times

Raise	6.8 Seconds
Dump	3.3 Seconds
Lower, Empty, Float Down	2.9 Seconds
Total Cycle Time	13.2 Seconds

### Traction Motor

Motor Type	Switched Reluctance	
Rated Power – Peak	250 kW	335 hp
Rated Power – Nominal	220 kW	295 hp
Rated Torque (peak, nominal = @ 12 km/h [7.5 mph] and nominal power)	3200 N·m/ 660 N·m	2360 lbf·ft/ 443 lbf·ft
Efficiency	95%	
Cooling Method	Liquid	
Ability of Regenerative Braking	Yes	
Service Interval	12,000-13,000 hours	

### Auxiliary Motor

Motor Type	Switched Reluctance	
Rated Power (peak, nominal)	226 kW	303 hp
Rated Torque (peak, nominal = 1,600 equivalent rpm)	600 N·m/ 531 N·m	443 lbf·ft/ 392 lbf·ft
Efficiency	96%	
Cooling Method	Liquid	
Service Interval	12,000-13,000 hours	

### Power Electronics

Inverter Rating	350A (nominal DC), 715VDC	
Cooling Method	Liquid (coolant)	
Component Ratings	IP67, IP69K	
Service Interval	12,000-13,000 hours	

### Grade Performance

Grade – %	25 Degree Ambient, 2% Rolling Resistance				
	0	5	10	15	20
Loaded – km/h (mph)	18 (11.2)	14.8 (9.2)	8.6 (5.3)	6.1 (3.8)	4.8 (3)
Unloaded – km/h (mph)	18 (11.2)	18 (11.2)	11.1 (6.9)	7.9 (4.9)	6.2 (3.9)

### Battery

<b>Battery Pack</b>	
Battery Chemistry	Li-Ion
Battery Monitoring	With integrated Caterpillar controls systems
Pack Voltage – Nominal	715 V
Pack Energy Capacity – Total	213 kWh
Charging Method	Ultra Fast Charge Onboard
On Board Fast Charging Charge time (0–100%)	Less than 20 minutes (two MEC500 in parallel) Less than 30 minutes (one MEC500)
Battery Cooling Method	Chilled Liquid (Extended Life Coolant)
Operating Temperature Limits (ambient)	50° C/–20° C (122° F/–4° F)
Charging Current, Voltage	1160A (output), 820VDC
Maximum Charging Rate	840 kW (two MEC500 chargers)
Minimum Charging Rate	500 kW
Charging Rate	Up to 4C (matched with MEC500 chargers)

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

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AEXQ3329-01 (05-2022)  
Replaces AEXQ3329  
(Global)

