

AD22

Underground Articulated Truck



Engine

Engine Model	Cat® C11 ACERT™	
Gross Power – SAE J1995 – Equivalent to U.S. EPA Tier 3/EU Stage IIIA	242 kW	325 hp

Operating Specifications

Nominal Payload Capacity	22 000 kg	48,501 lb
Gross Machine Mass	44 220 kg	97,488 lb
Body Capacities	9-12 m ³	11.8-15.7 yd ³

A New Truck for Compact Mining



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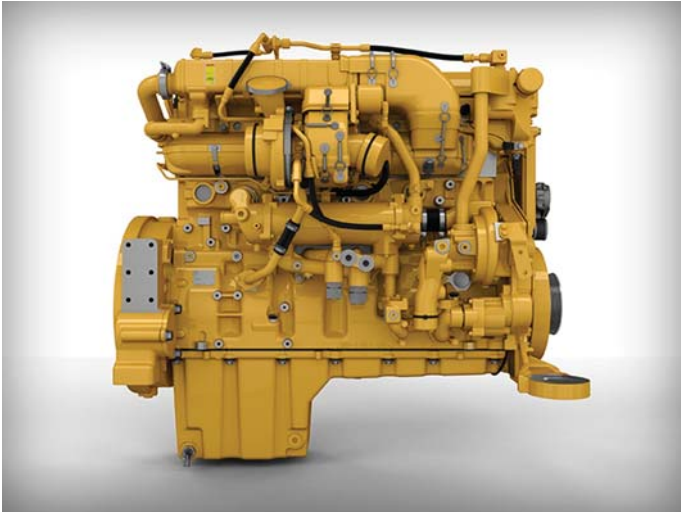
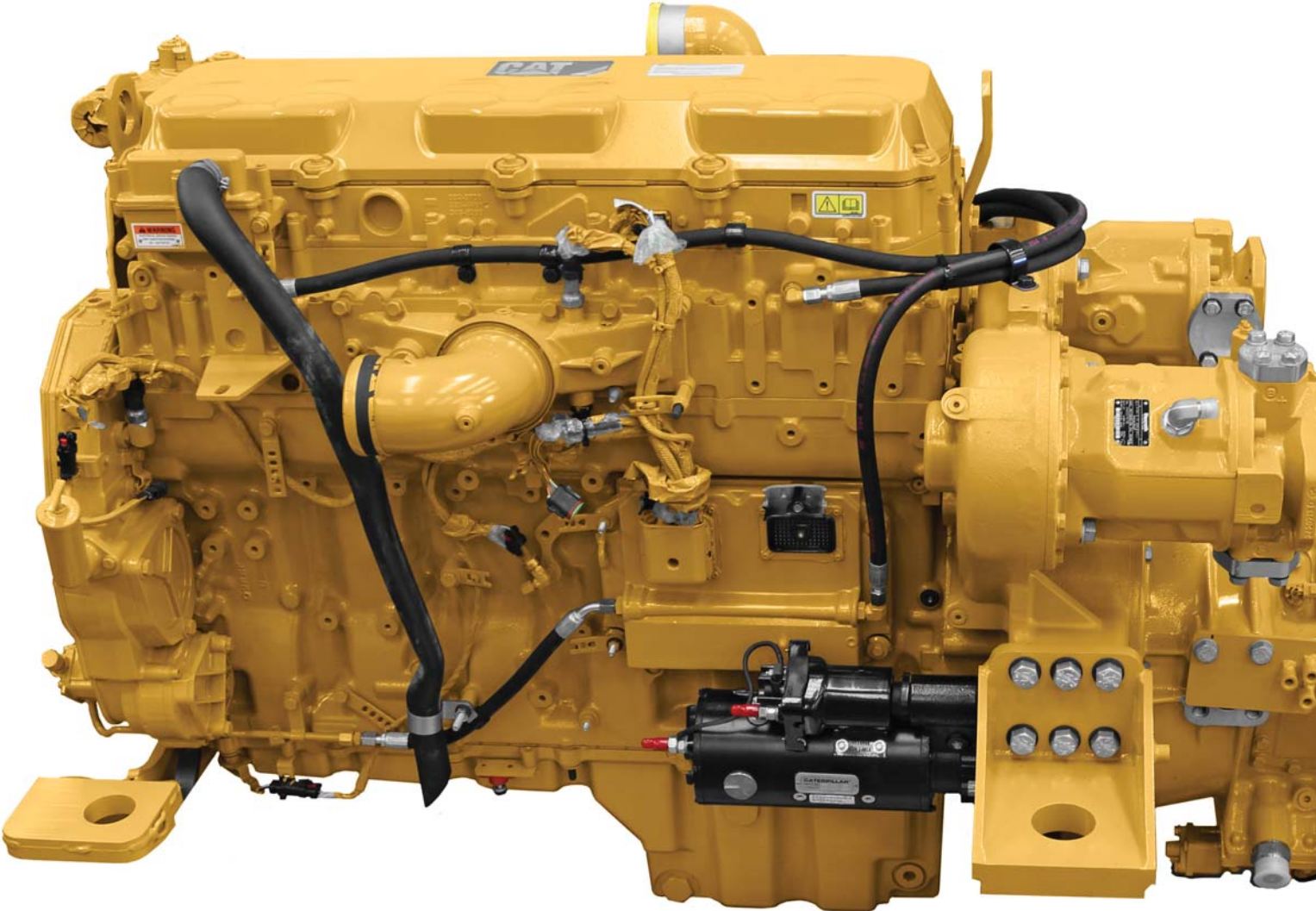
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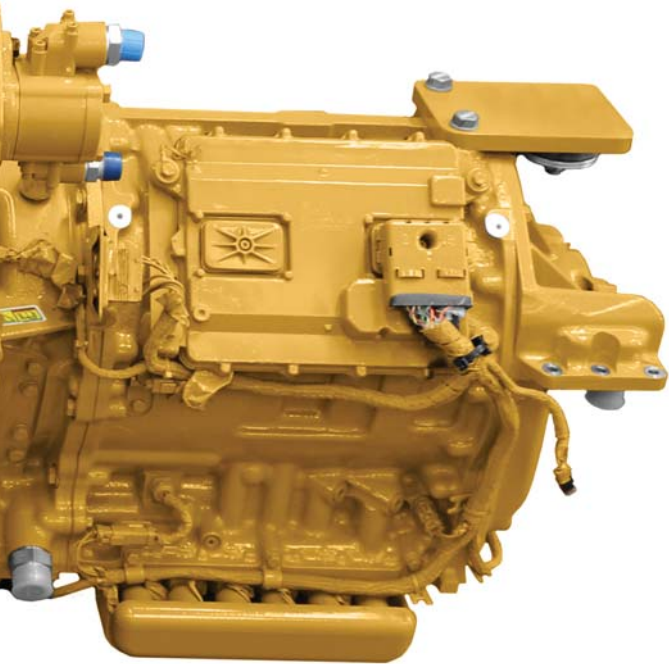


At 22 tonnes (24 tons), the Cat AD22 represents a new size class for Caterpillar with industry leading capacity for its size. This truck is powerful, quick and nimble. It is extremely productive in compact mining conditions on less than ideal haul roads. It can also be uniquely configured for your mine with different cab and body options (including an ejector body). The AD22 uses the C11 ACERT diesel engine and other Cat power train components to produce excellent low-end torque, speed on grade and top speeds of 25.3 km/h or 15.7 mph in 4th gear.

Power Train

Agile Performance for Tight Spaces





The Cat C11 ACERT diesel engine is a quiet, responsive performer that is proven in underground applications.

The C11 is an in-line, six-cylinder engine that uses ACERT to reduce emissions, deliver excellent fuel economy and provide outstanding low-end torque performance. The engine's rated speed is 2,100 rpm.

Here are some quick statistics on this engine:

- The engine has a bore of 130 mm (5.2 in) and a stroke of 140 mm (5.51 in).
- In the AD22, it is turbocharged and aftercooled for performance.
- It has a displacement of 11.1 L (677.36 in³) and a compression ratio of 17.2:1.

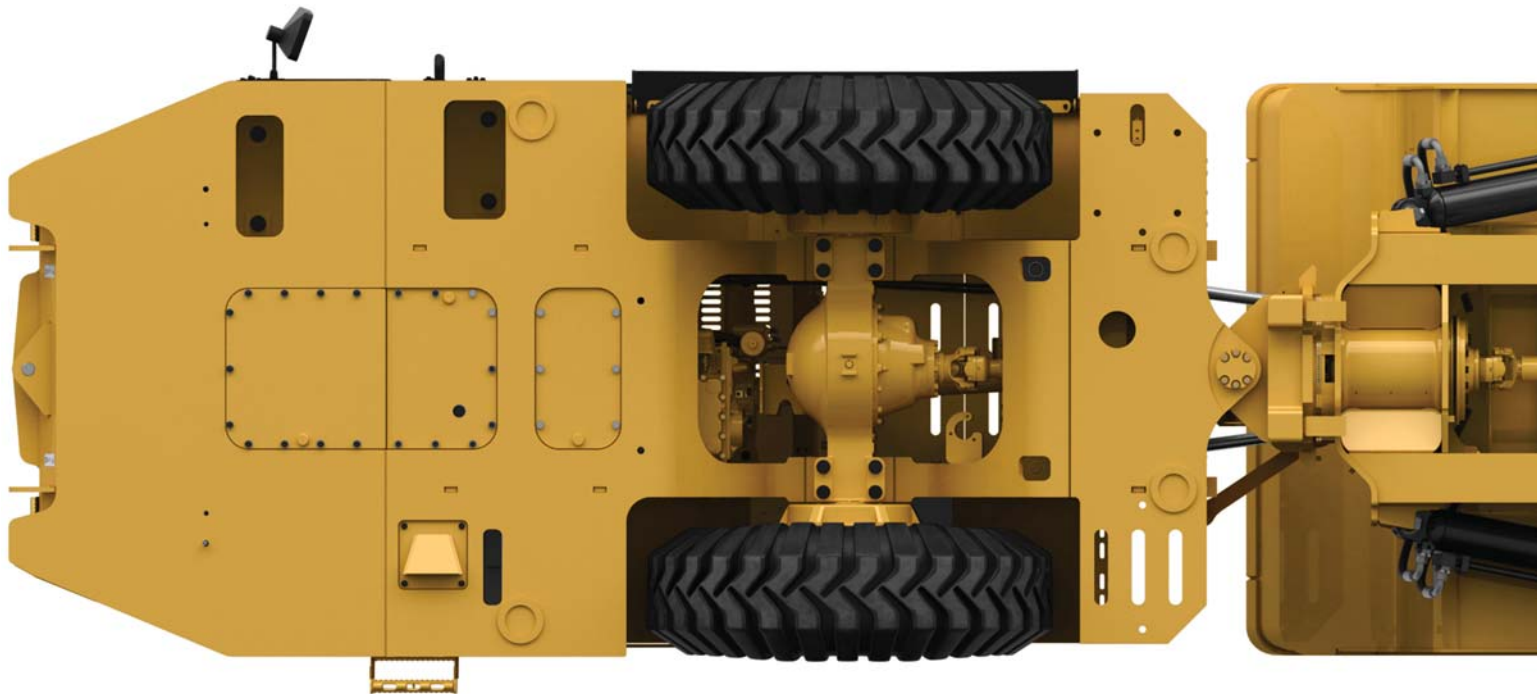
ACERT

ACERT is an emissions control and performance strategy developed by Caterpillar. It involves precise and efficient delivery of fuel using state of the art injectors, engine electronics and a proprietary method for routing air into the combustion process. The C11 ACERT uses MEUI – Mechanical Electronic Unit Injectors. One key to reducing emissions is to control temperature during combustion. To manage this, Caterpillar uses precisely timed microbursts of fuel during the four-stroke cycle. The quantity of fuel used will depend on the load being asked of the engine, and the fuel is highly atomized so that we're using every drop for work.

Transmission and Torque Converter with Lock-Up Clutch

Coupled to the C11 ACERT is a Cat heavy-duty torque converter with an automatic Lock-Up Clutch and our planetary powershift transmission. These components are responsible for the nimble performance, speed on grade and all-wheel drive capabilities of the truck. The transmission features our Electronic Clutch Pressure Control (ECPC) technology. ECPC protects the transmission from pressure spikes that can reduce component life, and it produces a softer shift for operator comfort. Both the engine and transmission are equipped with Cat ADEM™ A4 electronic controls.

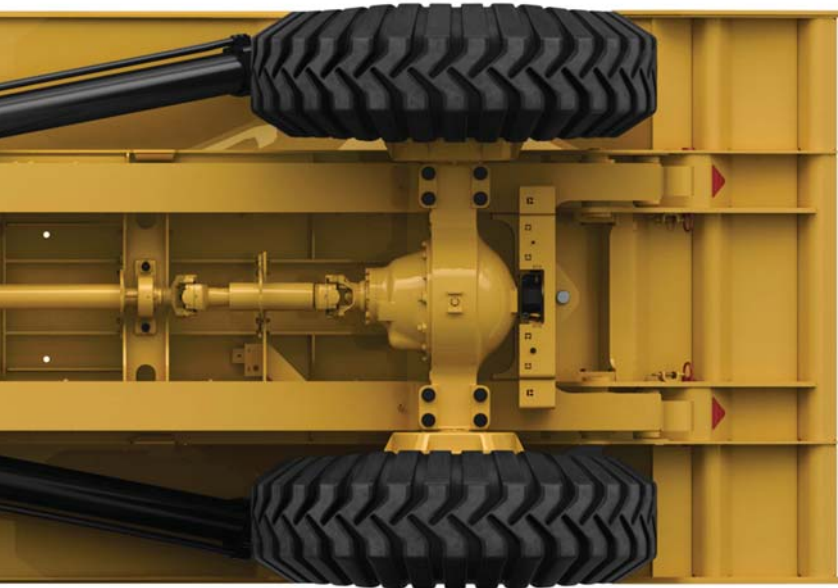
The torque converter and lock-up clutch manage available rimpull and drive train efficiency. If the truck is stopped on an uphill slope or under load conditions that require first gear – the truck will automatically select the gear it needs. This second gear take off is done automatically and is a component life and fuel saving feature.



Machine Frame and Structures

Simple Strength and Balance





The AD22 frame is constructed using box sections and incorporates belly guards on the engine end frame. Used throughout Cat truck designs, our box section construction allows the frame to manage torque loads and impact stresses.

The AD22 has been designed to carry 48 percent of its loaded weight on the front axle and 52 percent on the rear – giving the truck excellent balance and a well-positioned center of gravity. These attributes contribute to the long term life of components, operator comfort and machine stability.



Oscillating Hitch

Connecting the front and rear frames is an oscillating hitch that allows the two frames to work independently. The oscillating hitch has several advantages:

- Allows all wheels to maintain contact with the ground in uneven haul road conditions.
- It allows the truck to maintain greater speed and control.

Inside the oscillating hitch are hardened steel pins, tapered roller bearings and oscillation stops. An integrated rubber seal prevents the introduction of dust and debris into these parts.

Braking

Braking is achieved at all four corners of the truck and includes manual retarding capability.

- One simple hydraulic system is used for braking, secondary braking, initiating the park brake (on all four wheels), and hydraulically retarding the truck.
- The hydraulic system for brake cooling uses a gear driven pump that continuously circulates oil through the system.
- The brakes feature multiple adjustment-free discs and plates that are force-cooled for predictable performance without brake fading.

Operator Station

Easy, Adjustable and Integrated Protection



The operator controls on the AD22 are both simple to learn, provide important machine information to the operator, and have ergonomically designed controls to help with operator comfort.

We offer two operator station options for the AD22 – enclosed and open. Both are ROPS/FOPS certified and isolation mounted to reduce vibration. Each also offers an excellent field of vision directly around the machine.

The enclosed cab has several key features centered around safety and comfort:

- Sound suppression.
- Filtered air with air conditioning and heat.
- Mechanical suspension seating (Tee seat).
- Protective metal mesh for the rear window (optional).

The open cab can include protective mesh, and both cab options can be fitted with a rear facing camera.

Both cab options can accommodate a variety of operator sizes with adjustable seat positioning and tilting steering column. Three points of contact are positioned to help get the operator in and out of the cab safely.



Cab Information

Both cab configurations offer colored digital displays showing:

- Transmission selection.
- Current gear indicator.
- Engine coolant level.
- Engine temperature.
- Engine speed (RPM).
- Fuel level.
- Engine oil pressure.
- Truck speed.

Truck Body Options

Options to Fit the Need





Caterpillar is making available five body options for the AD22 to best match up with the specific gravity of your material.

Traditional Dump Bodies with a target payload of 22 tonnes (24 tons) include the following sizes:

- 9.0 m³ (11.8 yd³) (this body is standard to the machine).
- 10.0 m³ (13.1 yd³).
- 11.0 m³ (14.4 yd³).
- 12.0 m³ (15.7 yd³).

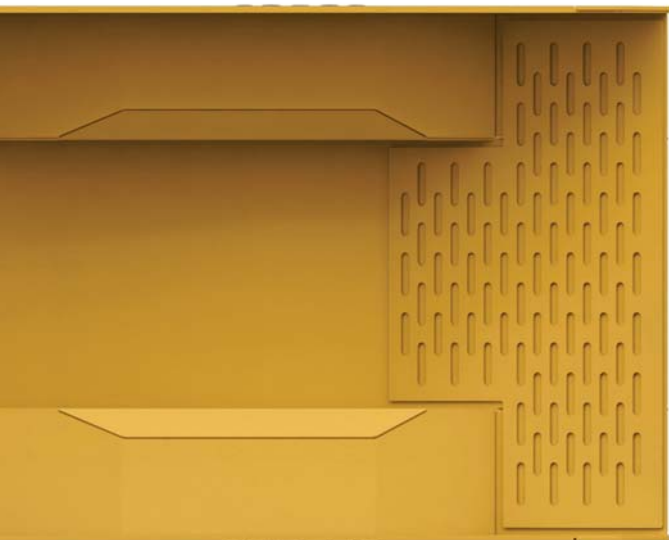
The AD22 traditional dump bodies have a body up speed restrictor for safety and include additional wear material on the rails.

Ejector

The single ejector body option is 9.7 m³ (12.7 yd³). This body option includes 8 mm (0.31 in) steel liner plate for abrasion resistance and additional wear material on rails. It includes a three stage ejector cylinder for quick unloading cycles. This body can be retrofitted to a traditional dump body chassis.

All bodies can be marked with optional reflective tape from the factory for improved visibility.

The AD22 is ideally pass matched with the R1300G and the R1600G/H – with three passes by the R1300G and two passes by the R1600G/H.





Electrical and Hydraulic Systems

Simple Designs, Easily Serviced





Hydraulics

One of the first things you notice as you look at the AD22 are the very clean hydraulic routings across the hitch.

The AD22 has three hydraulic systems:

- Gear pump driven brake cooling.
- Piston pump driven implement controls.
- Piston pump driven brake cooling.

The cooling fan is a two-speed demand fan – running only when coolant and transmission fluid temperatures reach a threshold.

All of the hydraulic systems are pulling from a single hydraulic tank that is bolted into the frame and has a refill capacity of 145 L (38.3 gal). A convenient access port simplifies cleaning the tank. Screens are located on the intakes to block debris.

Hydraulic oil filters have both manual and electronic sensors and will warn the operator if they become clogged.

The Cat cylinders used to steer as well as the body lift cylinders have a wiper mechanism to prevent any debris entering the cylinder.

The AD22 uses all hydraulic hosing for its routings – there are no tubes used in this truck.

Electrical

The AD22 electrical system is well designed around the corrosive environment typical of underground mining. Cat electrical connectors are designed for these environments, and our electrical harnesses have an excellent reputation for long life and wear in these challenging conditions. The integrity of our electrical components in this environment directly impact the reliability of the machine.

The AD22 is equipped with all LED lighting. The following are the standard lights available on the machine:

- Two dimming headlights.
- Brake and tail lights.
- Automatic reverse lighting.
- Cab mounted rear facing light.

Safety and Serviceability

An Uncompromising Commitment





One way this truck contributes to a safe work environment is its outstanding visibility to the work area. There is an excellent field of vision around the front of the truck, and rearview mirrors and a rear facing camera allow the operator to see what's happening to the sides and to the back of their work space.

When operating in reverse, the truck will sound an alarm. Operating mostly in a very dark and visibility-challenged environment – we've made sure there's good coverage by the LED lights on the machine, and visibility can be supplemented by optional high visibility tape placed on the truck.

The majority of all service and fluid level checks can be accomplished from ground level on this truck. The battery disconnect and engine lockout switches are located just behind the cab at ground level.

An engine shutdown switch is located near the engine and a second optional switch can be installed inside the cab.

Service access ports located on top of the engine end frame are accessible under service covers that are easy to open and close.

All walk areas on top of the machine have anti-skid surfaces, and three points of contact using strategically placed handrails are possible when climbing up on the machine.

A steering frame lock is conveniently located on the machine, along with dump and ejector body retaining pins and we offer optional lift cylinders guards.

Any time you need parts, rebuild services or professionals who are the experts on your Cat equipment – reach out to your local Cat dealer.



AD22 Underground Articulated Truck Specifications

Engine

Engine Model	Cat C11 ACERT	
Gross Power – SAE J1995 – Equivalent to Tier 3/Stage IIIA	242 kW	325 hp
Bore	130 mm	5.1 in
Stroke	140 mm	5.5 in
Displacement	11.15 L	680 in ³

- Power ratings apply at a rated speed of 2,100 rpm when tested under the reference conditions for the specified standard.
- Ratings based on SAE J1995 standard air conditions of 25° C (77° F) and 100 kPa (29.61 Hg) barometer. Power based on fuel having API gravity of 35 at 16° C (60° F) and an LHV of 42 780 kJ/kg (18,390 BTU/lb) when engine used at 30° C (86° F).
- Engine derate will commence at an altitude of 3353 m (11,000 ft).

Operating Specifications

Nominal Payload Capacity	22 000 kg	48,501 lb
Gross Machine Mass	44 220 kg	97,488 lb

Weights

Empty	21 338 kg	47,042 lb
Front Axle	16 217 kg	35,752 lb
Rear Axle	5121 kg	11,290 lb
Loaded	44 220 kg	97,488 lb
Front Axle	21 204 kg	46,747 lb
Rear Axle	23 016 kg	50,742 lb

Weight Distribution

Empty	
Front Axle	76.0%
Rear Axle	24.0%
Loaded	
Front Axle	48.0%
Rear Axle	52.0%

Transmission

Forward 1	5.6 km/h	3.5 mph
Forward 2	10.7 km/h	6.7 mph
Forward 3	16.0 km/h	9.9 mph
Forward 4	25.3 km/h	15.7 mph
Reverse 1	5.7 km/h	3.5 mph

- Maximum travel speeds with standard 18.00 × R25 tires.

Final Drives

Differential Ratio	5.429
Final Drive Ratio	4.765
Total Reduction Ratio	25.87

Body Hoist

Raise	13.0 Seconds
Lower	14.0 Seconds
Total Cycle Time	27.0 Seconds

Body Capacities

Body 1 (Standard Body)	9.0 m ³	11.8 yd ³
Body 2	10.0 m ³	13.1 yd ³
Body 3	11.0 m ³	14.4 yd ³
Body 4	12.0 m ³	15.7 yd ³
Ejector	9.7 m ³	12.7 yd ³

- Heaped SAE 2:1.

Turning Dimensions

Outside Clearance Radius	7469 mm	294.0 in
Inner Clearance Radius	4095 mm	161.2 in
Frame Oscillation	±10°	
Articulation Angle	45.0°	

Service Refill Capacities

Engine Crankcase with Filter	27.0 L	7.1 gal
Transmission	20.0 L	5.3 gal
Hydraulic Tank	145.0 L	38.3 gal
Cooling System	57.0 L	15.0 gal
Front Differentials and Final Drives	44.0 L	11.6 gal
Rear Differentials and Final Drives	44.0 L	11.6 gal
Fuel Tank	360.0 L	95.0 gal
Transfer Gear Box	4.7 L	1.24 gal

Tires

Tire Size	18.00 × R25
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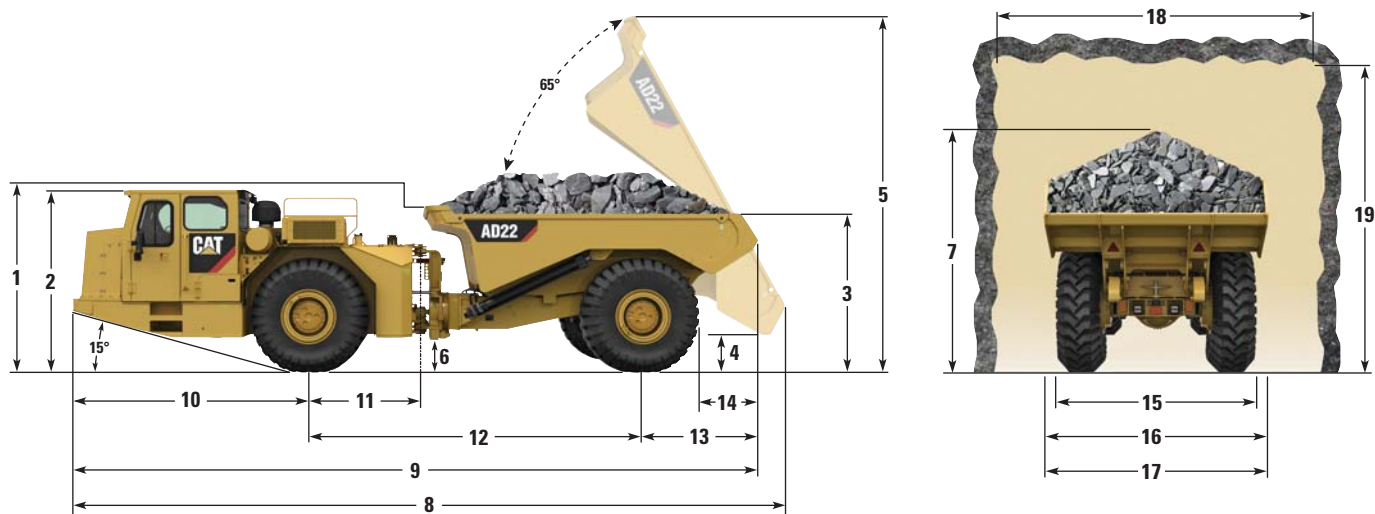
Standards

- ROPS/FOPS certified cab.

AD22 Underground Articulated Truck Specifications

Dimensions

All dimensions are approximate.



	524-9895		510-5285		500-5796		502-1172		526-6517	
	Dump Body (std)		Dump Body		Dump Body		Dump Body		Ejector Body	
Body Capacity	9.0 m ³	11.8 yd ³	10.0 m ³	13.1 yd ³	11.0 m ³	14.4 yd ³	12.0 m ³	15.7 yd ³	9.7 m ³	12.7 yd ³
	mm	in	mm	in	mm	in	mm	in	mm	in
1 Height – Top of Empty Body	2320	91.3	2320	91.3	2320	91.3	2420	95.3	2500	98.4
2 Height – Top of ROPS	2530	99.6	2530	99.6	2530	99.6	2530	99.6	2530	99.6
3 Height – Body Loading	2200	86.6	2320	91.3	2320	91.3	2420	95.3	2400	94.5
4 Height – Dump Clearance**	449	17.7	449	17.7	449	17.7	449	17.7	697	27.4
5 Height – Top of Raised Body	4822	189.8	4822	189.8	4822	189.8	4917	193.6	—	—
6 Height – Ground Clearance	393	15.5	393	15.5	393	15.5	393	15.5	393	15.5
7 Height – Top of Load (SAE 2:1)	2765	108.9	2885	113.6	2931	115.4	3031	119.3	2977	117.2
8 Length – Maximum Body Raised	9943	391.5	9965	392.3	9965	392.3	10031	394.9	10505	413.6
9 Length – Overall Body Down	9583	377.3	9593	377.7	9593	377.7	9593	377.7	9716	382.5
10 Length – Front Axle to Front Bumper	3393	133.6	3393	133.6	3393	133.6	3393	133.6	3393	133.6
11 Length – Front Axle to Hitch	1558	61.3	1558	61.3	1558	61.3	1558	61.3	1558	61.3
12 Length – Wheel Base	4608	181.4	4608	181.4	4608	181.4	4608	181.4	4608	181.4
13 Length – Rear Axle to Tail	1582	62.3	1592	62.7	1592	62.7	1592	62.7	1715	67.5
14 Length – Rear Wheel to Raised Body	867	34.1	867	34.1	867	34.1	867	34.1	867	34.1
15 Width – Overall Tire	2315	91.1	2315	91.1	2315	91.1	2315	91.1	2315	91.1
16 Width – Machine with Body	2315	91.1	2315	91.1	2500	98.4	2500	98.4	2500	98.4
17 Width – Machine without Body	2315	91.1	2315	91.1	2315	91.1	2315	91.1	2315	91.1
18 Recommended Clearance Width*	3500	137.8	3500	137.8	3500	137.8	3500	137.8	3500	137.8
19 Recommended Clearance Height*	3500	137.8	3500	137.8	3500	137.8	3500	137.8	3500	137.8

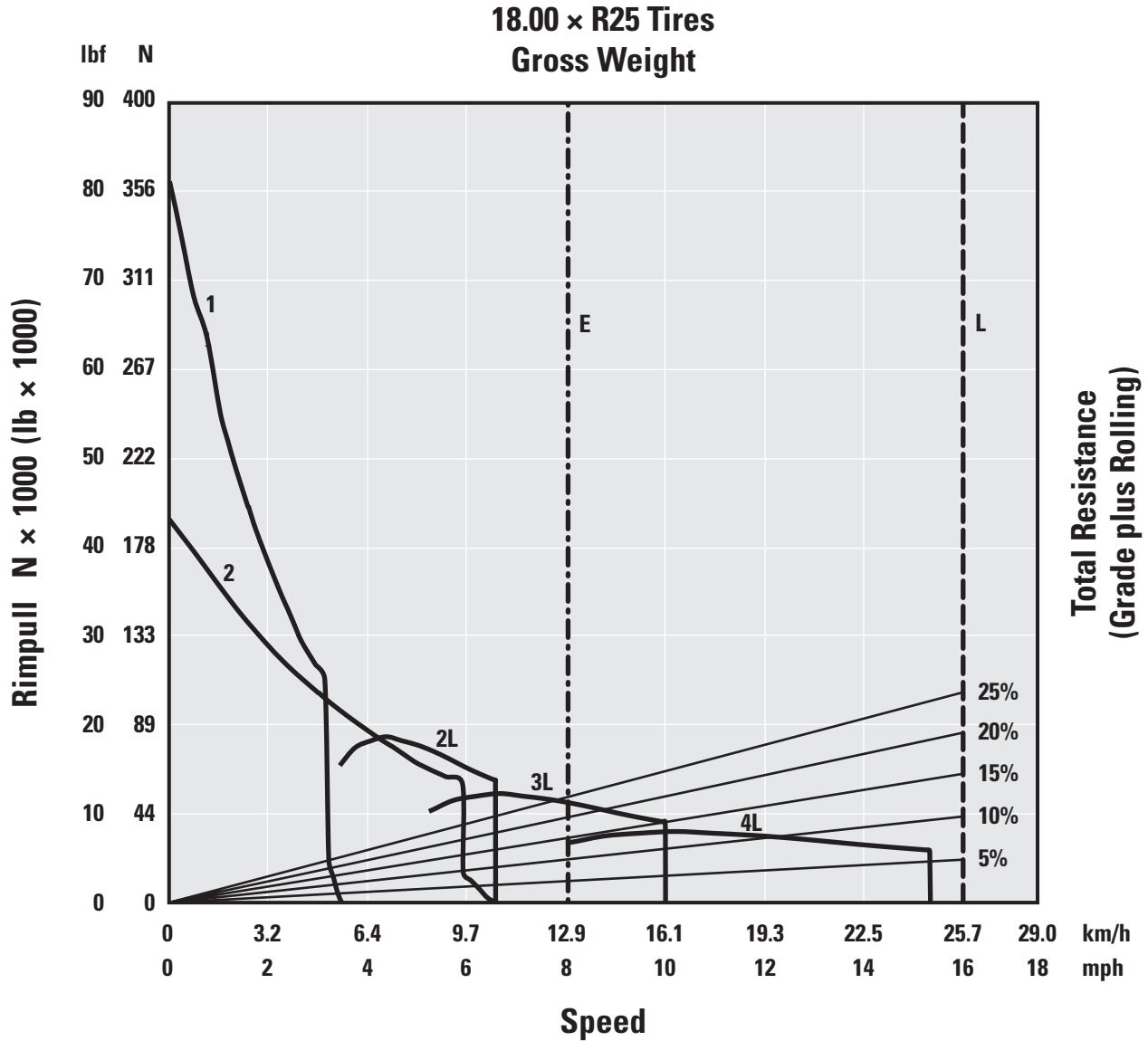
*Clearance dimensions are for reference only.

**Measurement taken with tailgate down for ejector body.

AD22 Underground Articulated Truck Specifications

Gradeability/Speed/Rimpull

To determine gradeability performance: Read from gross weight down to the percent of total resistance. Total resistance equals actual percent grade plus rolling resistance. As a general guide use 2% for rolling resistance in underground application or refer to the Caterpillar Performance Handbook. From the total resistance point, read horizontally to the curve with the highest obtainable gear, then down to maximum speed. Usable rimpull will depend upon traction available and weight on drive wheels.



- 1 – 1st Gear
- 2 – 2nd Gear
- 2L – 2nd Gear (Lock-Up Clutch)
- 3L – 3rd Gear (Lock-Up Clutch)
- 4L – 4th Gear (Lock-Up Clutch)

- E – Empty 22 220 kg (48,986 lb)
- L – Loaded 44 220 kg (97,488 lb)

Standard Equipment

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

ELECTRICAL

- 12V power supply in cab
- Alternator
 - 95 amp open cabin
 - 150 amp enclosed cabin
- Auxiliary start receptacle
- Battery disconnect switch, ground level
 - Front left hand side
- Circuit breakers
 - Main: 80 amp
 - A/C: 80 amp (enclosed cab)
 - Alternators: 105 amp (open)
150 amp for (enclosed)
- Corrosive protection spray
- Diagnostic connectors
- Electric starting, 24V
- Engine start lockout switch, ground level (LH)
 - Front left hand side
- Engine shutdown switch, ground level (RH)
 - Front right hand side
- Lighting, LED
 - Brake and tail light
 - Headlights with dimmer switch
 - Rear work light (cab mounted)
 - Reversing lights
- Low maintenance batteries
- Reversing alarm
- Starting and charging system
- Directional indicator lamps

POWER TRAIN

- Cat C11 ACERT ATAAC diesel engine, six-cylinder
- Auto shift transmission four speed forward/one speed reverse
- Manual fuel priming pump
- Exhaust, turbo compartment shielding
- Four wheel drive
- Long life coolant
- Body up speed limiter, 3-5 km/h (2-3 mph)
- Ejector body tailgate down speed limiter, 3-5 km/h (2-3 mph)
- Radiator cap manual release
- Radiator, single pane cross flow
- Rims, five-piece, tubeless
- Reverse modulated fully hydraulic enclosed wet, multiple-disc brakes, oil cooled
- Torque converter with automatic lockup

OTHER STANDARD EQUIPMENT

- Oscillating hitch
- Body, dump, 9.0 m³ (11.8 yd³)
- Catalytic exhaust purifier/muffler group
- Decals, international pictographics
- Engine and transmission belly guards
- Fenders, standard with LH front mud flaps
- Firewall
- Fuel system manual shut off tap
- Frame lifting lugs
- Front and rear tow pin
- Hand hold (access on/off top deck)
- Operation and Maintenance Manual
 - English and other applicable local language to select
- S·O·SSM port
 - Coolant
 - Engine oil
 - Hydraulic oil
 - Transmission oil
- Tire arrangement
 - Tire, Michelin 18.00 × R25 XKD1A
- Hydraulic and braking system manual pressure release function
- Steering frame lock
- Dump body retaining pins
- Ejector body retaining pin

OPERATOR ENVIRONMENT

- Dome light
- Door light
- Electric horns
- Open operator station ROPS/FOPS structure
- Operator present system
- Rearview mirrors
- Suspension seat, Tee, mechanical with retractable seat belt
- Tilt steering wheel
- USB charging port

OPERATOR ENVIRONMENT (cont'd)

- Electronic Monitoring System
 - Indicator lights
 - Parking brake
 - Electrical charging system
 - Engine oil pressure alarm
 - Engine coolant temperature alarm
 - Engine coolant level alarm
 - Transmission oil temperature alarm
 - Torque converter oil temperature alarm
 - Hydraulic oil temperature alarm
 - Transmission oil filter alarm
 - Brake cooling oil filter alarm
 - Brake system alarm
 - E stop
 - Brake drag
 - Transmission amber warning light
 - Engine amber warning light
 - IBA alarm
 - Secondary steering active
 - Operator present alarm
 - Hydraulic oil level alarm
 - Engine red fault light
 - Transmission red fault light
 - Steering oil pressure alarm
 - Retarder (on)
 - Body up
 - Hoist not on float
 - Cab door open
 - Turn indicators
 - High beam
 - Alert warning light
- Gauges (on screen display)
 - Engine coolant temperature
 - Transmission oil temperature
 - Fuel level
 - Engine oil pressure
 - Steering oil pressure
 - Brake accumulator oil pressure
 - Service brake oil pressure
 - Parking brake oil pressure
 - Tachometer
 - Speedometer
 - Gear indicator

AD22 Optional and Mandatory Attachments

Optional and Mandatory Attachments

Optional and Mandatory Attachments may vary. Consult your Cat dealer for details.

- Body dump
 - Body, 10.0 m³ (13.1 yd³)
 - Body, 11.0 m³ (14.4 yd³)
 - Body, 12.0 m³ (15.7 yd³)
- Body ejector
 - Body, 9.7 m³ (12.7 yd³)
- Camera, color rear facing
- Engine shutdown switch, cab
- Fluids
 - Arctic fuel
 - Arctic coolant
- Guard, mesh, open cab
- Guard, mesh, enclosed cab
- Park brake switch engagement
 - Push to apply
- Rims
 - Rim identification numbering
 - Spare, tubeless
- Seat cover
 - Tee
- Secondary steering system (electric driven)
- Service tools
 - Hoist cylinder supports (for body removal)
- Enclosed operator station (includes as standard):
 - Air conditioning (salt resistant)
 - Cab pressurizer and filter
 - Heater (electric)
 - Window, sliding, cab door
 - Windshield wiper and washer
- Reflective tape

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

AEHQ8139 (07-2018)

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