



### Engine

Engine Model Cat C11 ACERT <sup>™</sup>			
Gross Power - SAE J1995	242 kW / 325 hp		
Net Power - SAE J1349	237 kW / 317 hp		

### **Operating Weight**

Tare	29,450 kg	64,926 lb
GVM	41,950 kg	92,483 lb

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ACERT<sup>™</sup> Technology. Caterpillar optimizes engine performance while meeting EPA Tier 3 regulations. ACERT<sup>™</sup> Technology reduces emissions during the combustion process by using advanced technology in the air and fuel systems, in conjunction with integrated electronics. The Caterpillar engine meets emission regulations at the combustion source rather than recycling exhaust gases.

**ADEM A4 Control Module.** This module controls the fuel injector solenoids to monitor fuel injection. This system provides automatic altitude compensation.

**Turbocharger.** The C11 engine features a waste gate turbocharger that provides high boost over a wider range, improving engine response and peak torque, as well as providing low-end performance.



**Proven Fuel Injectors.** The Cat C11 has a proven high-pressure, direct injection fuel system. This system electronically monitors operator demands and sensors optimize engine performance.

**Maintenance.** The machine is equipped with Caterpillar high efficiency oil filters, whose design doubles efficiency without increasing the change interval. They provide clean oil to the engine, reducing wear on all lubricated surfaces.

**Reliability Features.** The C11 offers maximum reliability and response due to the following features:

- Improved fuel injectors and pump
- Leak-free design
- F Higher cylinder pressures
- Reinforced cylinder block

**Leak-Free Design.** Improved joints throughout the engine reduce the chance of leaks. The oil pan seal, timing cover and block to flywheel housing incorporate a leak-free design.

**Commonality.** The Caterpillar C11 engine is used in Cat products such as the 966H medium wheel loader, R1700G LHD and the 730 articulated truck. This engine commonality ensures the highest level of reliability and durability as well as superior parts availability worldwide.



### Engine

# The Cat engine delivers power, performance and durability.

**C11 Engine.** The Cat C11 uses Caterpillar's breakthrough ACERT<sup>™</sup> Technology to meet exhaust emission reduction standards. It features efficient fuel delivery, air management and electronic control for high productivity and exceptional service life.

**Engine Design.** The four-stroke engine provides efficient fuel combustion. Precise engineering and thorough testing assure durability, reliability and power. Built-in serviceability and excellent fuel economy lower operating costs.

### **Power Train**

The integrated Cat power train delivers performance and reliability in tough conditions.



**Six-Speed Transmission.** The field proven Cat power shift countershaft transmission easily matches engine power to the load size and ground conditions.

**Gear Application.** Gear ratios are designed to maximize productivity in specific cycle segments.

- Gear 1 provides highest rimpull capability for heavy load applications.
- Gears 2, 3, 4 for normal loads and higher speed operations.
- Gears 5 and 6 provide excellent empty return and roading speeds.

**Torque Converter.** The large, heavy-duty torque converter maximizes the productivity of the entire drive train. The torque converter is matched to the Cat C11 engine for excellent rimpull and performance.

**Lock-up Clutch.** The integral lock-up clutch allows the machine to operate in converter drive for greater rimpull, or direct drive for high efficiency hauling and faster travel speeds. Direct drive capability allows up to 15% higher travel speeds when the lock-up clutch is engaged.

**Auto Lock-up.** The lock-up clutch automatically engages according to ground speed and engine speed conditions. This feature is handled electronically and allows for increased travel speeds in the same gear.



**Reduced Shifting.** Torque multiplication capability of the torque converter reduces the need for the operator to continually shift the transmission. This reduces operator effort and improves machine productivity.

**Oscillating Front Axle.** The front axle features an oscillating pinion-mounted design to ensure four wheel ground contact for maximum traction and stability. The axle housing is a durable ductile iron for the centre housing and leg housings.

**Fixed Rear Axle.** The rear axle is rigidly mounted to the rear frame.

**Service Brake Components.** Brake components are housed inside the axles, protecting them from dirt, dust and wet ground conditions. Inboard brakes allow for splash lubrication and forced brake cooling. They are virtually maintenance free, and provide reliable brake performance.

**Parking Brake.** The parking brake is a spring applied oil released "fail to safe" enclosed wet disc wheel end brake.

**Oil Sump.** Full axle-length oil sump delivers excellent lubrication and heat rejection for long component life.

**Splash Lubricated.** All axle components are splash lubricated. The outboard bearings are maintenance free.

**Heat Rejection.** Oil capacity provides excellent heat rejection, ensuring proper lubrication of all axle components.

**Retarder.** Hand control retarder provides excellent machine control on grades.







## **Operator Station**

# Easy to operate controls result in less fatigue.

**Comfortable Work Station.** An open operators station is standard. It combines safety, comfort and ease of machine tramming. It includes the following features:

- ROPS / FOPS
- Suspension seat
- Safety belt
- Resilient mounting
- F Enclosed operator station available as an option

**Transmission Controls.** The transmission control for forward, reverse and gear range is conveniently located for the operator's right hand. The operator can control machine functions with minimal effort, allowing greater concentration on vehicle operation and reduced operator fatigue.

**Engine Protection System.** An engine protection system is fitted that will shut down the engine if low engine oil pressure, low coolant level, or coolant over temperature conditions are experienced.

**Additional.** The cab is pre-wired and fitted for an entertainment radio and a 2-way radio.

**Cab Mounting.** The modular ROPS / FOPS cabin is resiliently mounted on the truck chassis, reducing vibration for greater comfort and a quieter ride.

**Monitoring Controls.** Conveniently located and easy -to see gauges and displays make monitoring machine systems as simple as possible.

**Monitoring System.** Continuously provides critical machine data. A three-level warning system alerts the operator of any abnormal machine health conditions.

**Gauges.** Provide a constant display of vital machine functions, including engine coolant temperature, transmission oil temperature, engine oil pressure, engine speed, vehicle speed and fuel level.

Steering Column. Tilts to fit any size operator.

**Water Cannon.** The hydraulically controlled cannon offers a full 360° range of slew operation and 70° of elevation (45° above horizontal, 25° below horizontal).

The cannon is supplied with a 28mm (1 1/8") director nozzle standard, capable of throwing water 60 metres at 100 psi, with a range of optional nozzle sizes available to suit your specific requirements





	Maximum Throw of Jet (m)					
Nozzle			Nozzle Di	ameter		
Pressure (PSI)	1/4	1/2	5/8	3/4	1	1 1/8
0	0	0	0	0	0	0
20	10	12.7	14.55	16.7	19.1	22.4
40	12.1	19.1	22.4	25.5	31.8	38.8
60	12.7	21.8	26.36	30	38.8	45.5
80	12.7	23.3	29.4	32.5	43.6	54
100	12.7	24.2	30.3	34.5	47.9	60
120	12.7	24.85	31.2	37.3	52.1	63.65
140	12.7	25.45	32.73	40	55.8	66.7
160	12.7	26	33.3	41.2	59.4	69.7



					Flow	(lpm)				
Pressure					Nozzle [	Diameter				
(PSI)	1/16	1/8	1/2	5/8	3/4	1	1 1/8	1 1/4	1 3/8	1 1/2
30	2	8	134	210	302	538	680	840	1016	958
40	2	10	155	244	349	622	785	970	1175	1399
50	3	11	172	273	391	693	878	1084	1315	1562
60	3	12	189	298	439	760	962	1184	1436	1709
70	3	13	206	319	462	819	1042	1285	1554	1848
80	3	14	218	344	491	878	1113	1373	1659	1978
90	4	15	231	365	521	932	1180	1453	1760	2595
100	4	15	248	382	550	983	1243	1533	1856	2209
110	4	16	260	403	584	1029	1302	1613	1945	2314
120	4	17	269	420	605	1075	1361	1680	2033	2419
130	4	17	281	437	630	1121	1415	1747	2117	2520
140	5	18	290	454	655	1163	1470	1814	2197	2612
150	5	19	302	470	676	1201	1520	1877	2272	2705

#### WATER CANNON NOZZLE PERFORMANCE

Water Delivery System. This can be tailored to customer requirements with the following features available:

Optional systems:

- Single centre nozzle
- Side mounted nozzles
- Removable screen at the filling cone to eliminate debris entering tank
- High pressure hose reel
- Multiple pump flow rates
- Water pump flow controlled by ground speed





**High Pressure Water Delivery System.** This system has a high pressure water spray head attached to the water cannon.

The system utilizes a hydraulic driven high pressure Dynaset water pump model number HPW 460/50/115.

Waterflow and pressure is adjustable with a maximum flow of 50 litres per min at 6670 psi.

The spray head is equipped with 3 solid stream spray nozzles a total opening equivalent to 1.8 mm to provide the highest impact per unit area.

Optional spray nozzles are available to adjust spray angles.











**Water Cannon.** 11,750 litre heavy duty tank (as shown in brochure). Up to 17,000 litres available depending on cannon configuration.

Water Module. Up to 20,000 litres available (no cannon).

The tank is installed with internal baffles to reduce water surge.

Hydraulically driven high volume pump variable speed control high flow pump (750 GPM @ 300psi) provides optimum control of water flow.



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**Load Sensing Hydraulics.** A load sensing variable displacement pump and pressure compensating system continually monitor hydraulic power requirements, then provides power based on demand.



**Teleremote system.** The ATX 2200 Remote Control system will provide teleremote control of the water truck.

The Control Master® Teleremote system will allow the truck to be operated in either manual (normal) control or remote control mode. When the truck is selected to operate in remote control mode the operator will be able to operate the machine from a distance using an ATX2200 Transmitter set and an MTA (Modular Teleremote Assembly).



The teleremote system will provide operation of

- Steering proportional
- Throttle proportional
- F Brakes proportional (adjustable rate of application)
- Engine start/stop
- Lights head lights and work lamps
- Park brake
- Gears Forward / Reverse, 1<sup>st</sup> and 2<sup>nd</sup> speeds
- Horn

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- AFFF Fire Suppression System activation
- Pre-start alarm
- Boom control
- Water cannon control

The teleremote system will provide feedback for

- Level 2 warning (check engine)
- Level 3 warning (stop engine)
- Park Brake applied

The teleremote system will consist of four (4) cameras with a dual channel teleremote transmitter.

- Camera mounted to the front and rear of machine for machine control
- Camera mounted on the swivel nozzle pipe will allow monitoring of the water cannon
- Camera mounted on the fixed base of the boom will allow vision to position the boom



## Safety

### Mining machines that are designed with safety as the first priority.

**Product Safety.** The WR820 Underground Water Truck with Cannon is designed with safety as an integral part of all machine and systems design.

**Centralised Machine Isolation.** The single access point provides easy access to all engine machine isolation functions

- Find the provide the second second
- Starter Isolation switch

**Protective Structure.** The operator station has integrated into its construction a ROPS / FOPS (Roll-Over Protective Structure AS2294-2) (Falling Object Protective Structure AS2294-3) that offers protection to the operator . The modular ROPS / FOPS cab is resiliently mounted to the engine end frame, reducing vibration for greater comfort and a quieter ride.

**Handrails.** Handrails are fitted standard in accordance with ISO 2867:2011.

**Steering.** Fully hydraulic control. Meets the following standards: SAE J1511 OCT90, ISO 5010-1992.

#### Additional Safety Features.

- Anti-skid deck surfaces
- 7 3 point access to cab and machine
- F Suspension seat
- Inertia reel retractable seat belt
- Steering frame lock
- Hinged belly guards
- Ceramic coated exhaust manifold and turbine housing
- Triple insulated battery cables
- F Electrical wiring run independent of all hosing
- Fuel water separators manufactured from nonflammable material
- Firewall / heatshields
- F Handrails
- Machine interlocks
- Centralised isolation point
- Integrated fire suppression system (optional)

**Service Access.** Easy access to daily service points simplifies servicing and time spent on regular maintenance procedures.

**Ground Level Access.** Most filters and lube points are accessible from the ground without special tools. Remote lubrication points make daily attention to hard-to-reach joints easy.

**Interlock.** If the operator fails to apply the park brake prior to exiting the cab, the interlock system will detect the absence of operator input and apply the park brake, neutralize the steering, implements and transmission.



### Serviceability

### Increased productivity through ease of service.



**Frame Access.** Steps and grab handles are standard on the engine end frame and cab for easy access to the service and operation areas.

**Bolt-on Guards.** Bolt-on belly guards offer protection to critical components, are hinged and easily removable for servicing.

**Air Filters.** Radial seal air filters makes them easy to change, reducing air filter maintenance times.

**Diagnostics.** Electronic control system enables quick diagnosis of engine/transmission conditions and effective maintenance and repairs. Filters and lubrication points are accessible from the ground without special tools. Remote lubrication points make daily attention to hard-to-reach joints easy.

**Pressure Taps.** Conveniently located for easy access to hydraulic system pressure measurements.

**Spin-on Oil Filters.** Spin-on fuel and engine oil filters shorten downtime.

**Ecology Drains.** All major fluid compartments (hydraulic tank, engine oil pan, radiator, axles and transmission) incorporate ecology drains to make regular maintenance easier, and protect the environment from accidental oil spills.

**Centralised Service Center** that includes fast fill and evacuation points, fluid sampling points and a battery isolation point is available as an option.

**Electrical System.** The 24V electrical system delivers dependable electrical power for engine cranking, additional lighting and engine diagnostics. Wiring circuits are color coded, numbered for easy diagnosis and repair. All circuits are protected by circuit breakers. Wiring is double insulated with sealed electrical connectors to prevent moisture and dirt access. Harnesses are covered with fire resistant material for additional protection.

Battery cables are triple insulated for extra protection against rubbing.

**On-Board Diagnostic Systems.** The monitoring system continuously checks all critical machine functions and components and helps locate faults quickly for faster repair. Extremes are recorded, including fluid temperatures, engine speed and electrical system events.

## **Specifications**

#### Engine

Engine Model	Cat C11	ACERT™
Gross Power SAE J1995	242 kW	325 hp
Net Power ISO9249	239 kW	321 hp
Net Power SAE J1349	237 kW	317 hp
Displacement	11.15 L	680 in <sup>3</sup>
Bore	130 mm	5.1 in
Stroke	140 mm	5.5 in
Number of Cylinders		6
Max Torque @ Rated Speed	1430 Nm (	🗊 1300rpm
Derating Altitude	3048 m	9843 ft

- These ratings apply at 1,800 rpm when tested under the specified condition for the specified standard.
- Net power advertised is the power available at the flywheel when the engine is equipped with fan, air cleaner, muffler and alternator. No derating required up to 3,048 m (9,843 ft) altitude.
- Ratings based on standard air conditions of 25' C (77' F) and 99 kPa (29.32 in Hg) dry barometer. Used 35' API gravity fuel having an LHV of 42,780 kJ/kg (18,390 BTU/lb) when used at 30° C (86<sup>0</sup> F) [ref. A fuel density of 838.9 g/L (7.001 lb/gal4].
- Net power when fan is at maximum speed is 210 kW (282 hp) per the SAE reference table.

#### Weights Approximate

Tare Mass	29,450 kg	64,926 lb
Gross Vehicle Mass	41,950 kg	92,483 lb

#### **Power Train**

Travel Speed - Fwd. 1st	4.8 km/h	3.0 mph
Travel Speed - Fwd. 2nd	9.1 km/h	5.7 mph
Travel Speed - Fwd. 3rd	13.8 km/h	8.6 mph
Travel Speed - Fwd. 4th	21.1 km/h	13.2 mph
Travel Speed - Fwd. 5th	29.3 km/h	18.4 mph
Travel Speed - Fwd. 6th	34.6 km/h	21.6 mph
Travel Speed - Rev. 1st	5.3 km/h	3.35 mph
Transmission	6 fwd / 1 r	ev powershift
Transmission Cooler Type	Tub	be and Bund
Travel speed on 1:7 grade c	alculated	
Maximum GVM	7.2 km/hr	4.5 mph
Empty	21.1 km/hr	13.2 mph
Steering, Frame Articulation	+/-	45 degrees
Brakes - Service Type	Multiple	disc enclosed
Brakes - Parking Type	Spring applied	wheel ends

#### Hydraulic System

Circuit Type	Closed centre v	ariable flow
Pump type	ŀ	Axial piston
Pump Output	174 L/min	46 gal/min
Relief Valve Setting	21,000 kPa	3045 psi
Steering valve	Direct linl	k, non follow
Steering Cylinder - Bore	88.9 mm	3.5 in
Steering Cylinder - Stroke	437.5 mm	17.22 in
Steering Cylinder - Rod Dia	50.8 mm	2 in

#### **Electrical System**

Alternator	100 amp
Electrical System	24v
Battery - Quantity	2
Battery - Volts	12v
Battery - Capacity	950CCA
Starting System	Direct Electric

#### **Operator Station**

**FOPS Standards** 

- FOPS Canopy (Falling Object Protective Structure meets AS2294-3)
- 7 Optional fully enclosed cabin with air conditioning

## **Specifications**



#### Dimensions

Tramming Length	10,567 mm	416.0 in
Tramming Width	2,450 mm	96.5 in
Tramming Height	2,600 mm	102.4 in
Wheel Base	4,608 mm	181.4 in
Axle Centre to Hitch (F)	1,558 mm	61.3 in
Axle Centre to Hitch (R)	3,050 mm	120.1 in
Ground Clearance	336 mm	13.2 in
Outer Turning Radius	7,780 mm	306.3 in
Inner Turning Radius	4,410 mm	173.6 in
Tyres		23.5 R25

#### Service Refill

Fuel Tank	361 L	94 gal
Cooling System	67 L	18 gal
Differential, Final Drive (F)	55 L	14.5 gal
Differential, Final Drive (R)	55 L	14.5 gal
Engine Oil	41 L	11 gal
Transmission, Torque Converter	36 L	9.5 gal
Hydraulic Tank	151 L	49 gal

## **Machine Equipment**

### Standard equipment.

#### ELECTRICAL

Accessory power port (12V) Alarm, back-up Alternator, 100 amp Anti-corrosion protection spray Batteries, maintenance free (2-1000 CCA) Battery isolation lockable disconnect switch (2 post) Brake and tail lights Caterpillar Electronic Monitoring System (CEMS) Diagnostic connector Emergency stop switch (ground level) Headlights with dip switch Horn, warning Rear work light (cab mounted) **Reversing lights** Starting and charging system, 24V Starter, electric, heavy duty Sealed electrical connectors

#### **OPERATOR ENVIRONMENT**

Computerised monitoring system Instrumentation, gauges: Engine coolant temperature Fuel level Hydraulic oil temperature Tachometer Torque converter oil temperature Instrumentation, warning indicators: Brake oil pressure Engine oil pressure Lockup clutch Parking brake application Primary steering pressure Secondary steering pressure (if equipped) System voltage Transmission filter bypass Work lights Instrumentation, digital data: Computerised diagnostics and monitoring Engine rpm Gear and direction Odometer Service hour meter Dome light Open operator station, FOPS Seat, suspension with retractable seat belt Steering wheel, tilt and telescoping

#### POWER TRAIN

Air cleaner, 2-stage with pre-cleaner Brakes Parking, four wheel spring applied, enclosed disc Service, four-wheel pressure applied enclosed disc Driveline slip-joint, lubricated for life Engine, Cat C11, ACERT Technology, ATAAC Engine over speed inhibitor Fan, sucker Filters, fuel/engine air, primary/secondary Final drives, inboard planetary Fuel transfer pump (mechanical) Fuel tank, high capacity Lock-up torque converter Long-life coolant (-50°C protection) Muffler/catalytic converter Radiator Steering, rotary metering pump Transmission, countershaft power-shift (6F/1R) with auto-shift function Universal joints, lubricated for life

#### HYDRAULICS

Closed center-load sensing system Line filter, full flow return Hydraulic oil cooler Hydraulic 3 Stage knuckle Boom crane Lift 105 degrees Swing +/- 60 degrees Load check valves on all circuits

#### WATER SYSTEM

12,500 Litre water tank Internal baffle balls Removable lid Water Cannon Rotation 360 degrees Tilt 75 degrees 16 mm nozzle Water pump system High Flow Hydraulic driven

#### OTHER STANDARD EQUIPMENT

Articulation lock link Ecology drains (engine, hyd. tank, axles, transmission) Engine enclosures, hinged Guards, hinged - under engine & transmission Manual pressure release radiator cap Mudguards Oscillating front axle Semi centralized manual lubrication system SOS<sup>sm</sup> oil sampling ports Tie down points & tow-pins (front & rear) Tyres and tubeless rims (23.5R25)

## **Machine Equipment**

### **Optional equipment.**

Automatic brake retarder control Automatic grease lubrication system Auxiliary start receptacle Brake system oil pressure gauges Camera / monitor, reversing Camera / monitor, boom Centralised service centre Dual speed control Enclosed air conditioned cabin Windshield wiper washer Window, sliding, operator Heater, cabin Engine air pre-cleaner Engine exhaust, flow-through filter Engine exhaust, particulate filter Engine shutdown system to idle/stop Fast-fill system Coolant Engine oil Fuel Hydraulic oil Transmission oil Fire extinguisher, hand held Fire suppression system Firewall Hvdraulic tank level alarm Low transmission oil pressure monitoring Manual brake retarder control Payload measuring system Reversing camera Secondary steering Shielded engine exhaust manifolds

Electrical Alarm, tray-up Alternator, high output Ground level disconnect switch (4 post) Ground level shutdown switch Jump start receptacle Turn indicators

External stainless steel braided fuel lines Grease lubrication system, centralised manual Grease lubrication system, automatic Heat-shielding on hoses Low transmission oil pressure system Mirrors, rear view

10,000 Litre water tank 15,000 litre water tank Multiple spray nozzles Dust suppression Cleaning of drives

### Notes

### WR820 Underground Water Truck with Cannon





Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment.

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