

# 938H

Wheel Loader



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**Cat® C6.6 Engine with ACERT™ Technology**

**Gross Power (SAE J1995)** 147 kW/200 hp

**Net Power (ISO 9249) at 1800 rpm** 134 kW/182 hp

**Bucket Capacity** 2.3 to 3.0 m<sup>3</sup>

**Operating Weight** 15 100 to 15 600 kg

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# 938H Wheel Loader

*H-Series Wheel Loaders – The New Standard For Midsize Loaders*

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## Reliability and Durability

- Proven components and technology
- ✓ ■ ACERT Technology maintains performance, efficiency and durability while meeting emissions regulations
- Heavy duty components stand up to all operating conditions
- Strong, solid structures built to last
- ✓ ■ Diagnostic systems monitor product health to ensure reliability
- Unmatched parts availability and dealer support

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## Productivity and Versatility

- ✓ ■ Improved cycle times with Load-Sensing hydraulic system
- ✓ ■ Locking differentials provide superior tractive effort in poor underfoot conditions
- Constant net horsepower through the operating range
- Special machine arrangements for specialized applications
- Large variety of Cat® Work Tools

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*Performance you can feel with the capability to work in the most demanding applications. Unmatched operator comfort and efficiency in a world class cab. Revolutionary electronics and hydraulics for low-effort operation. Increased productivity with lower owning and operating costs.*



✓ *New features*

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## Operator Comfort

- Easy entry and exit
- Excellent visibility
- Comfortable environment with controlled vibration
- Choice of steering and implement control systems

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## Serviceability

- ✓▪ Service centers for convenient maintenance
- ✓▪ Exceptional ground-level access to service points
- ✓▪ Monitoring systems and dealer support reduce unexpected downtime
- ✓▪ Cat Product Link giving you high-speed access to a world-class dealer service

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## Owning and Operating Cost

- Proven fuel efficiency
- Superior maintenance
- ✓▪ Electronic systems monitor product health and performance
- ✓▪ Engine idle management system
- Complete dealer support

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## Reliability and Durability

*The Cat 938H – Built Strong and Tough – Tested And Proven – Ready To Work*

- Validated components and technology
- Electronic systems monitor vital machine components
- Excellent uptime from the best dealer support network in the industry
- Unmatched genuine Cat parts availability



**Proven Reliability.** The 938H features many of the components designed and proven in various Caterpillar products – all contribute to the reliability of the 938H:

- Frames
- Axles
- Countershaft powershift transmission
- Individual component cooling system
- Cab

**ACERT™ Technology.** Since March 2003, ACERT Technology has been proving itself in on-highway trucks. More recently it has proven itself again in field tests of off-highway equipment. This technology allows Cat engines to meet durability and reliability expectations without sacrificing performance.

**Engine Idle Management System.** The Engine Idle Management System (EIMS) maximizes fuel efficiency and provides flexibility in managing idle speeds for specific application requirements. Four controlled idle speeds are available.

**Engine.** The Cat C6.6 is a 6.6 liter displacement, in-line six cylinder engine. The C6.6 utilizes ACERT Technology, a series of Caterpillar engineered innovations that provides advanced electronic control, precise fuel delivery and refined air management, resulting in outstanding performance and lower emissions.

The C6.6 with ACERT Technology offers a compact design with big, heavy duty engine features for outstanding durability, reliability and performance. The C6.6 incorporates a new cross flow cylinder head design, 4 valve head and an ADEM A4 electronic controller. The C6.6 also features a proven cylinder block, pistons and crankshaft.

### **Electronic Control ADEM A4.**

The Advanced Diesel Engine Management – Electronic Control Module consistently monitors important engine conditions and functions. It uses sensors throughout the engine to regulate fuel delivery and all other engine systems that require input to manage load and performance. The ADEM A4 controller is the brain behind engine responsiveness, self-diagnosis, controlling emissions and fuel economy.

**Air Management.** Air management is a key concept in optimizing engine performance and controlling emissions. Engines must breathe clean cool air in order to perform. To aid this, the C6.6 uses a turbocharger fitted with a smart waste gate to give precise and reliable control of the boost pressure. A new cross-flow design in the cylinder head facilitates air movement, while tighter tolerances between the piston and cylinder wall reduce blow by gases.

**Fuel System.** Through multiple injection fuel delivery, fuel is introduced in the combustion chamber in a number of precisely controlled microbursts. Injecting fuel in this way allows for precise shaping of the combustion cycle while reducing engine sound levels

**Fuel Pump.** The C6.6 uses an oil-lubricated high-pressure fuel pump to feed a common fuel rail. By using an oil-lubricated fuel pump, the C6.6 has been designed to be more tolerant of alternative fuels.

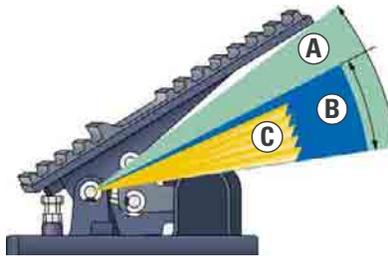


**Powershift Transmission.** The 938H continues to use power shift transmission technology proven on previous series. The countershaft power shift transmission features heavy-duty components to handle the toughest applications. Built-in electronic controls enhance productivity and durability.

**Controlled Throttle Shifting.** Control Throttle Shifting regulates engine speed during high-energy directional and gear changes for smoother shifting and longer component life.

**Electronic Clutch Pressure Control.** Electronic Clutch Pressure Control (ECPC) system modulates clutches individually to improve shift quality, component life and operator comfort. Adjustment is simplified with all solenoid valves externally mounted on top of the transmission housing.

**Axles.** The 938H axles are designed by Caterpillar for durability in all operating conditions. The front axle is rigidly mounted to the frame to support the weight of the wheel loader and withstand internal torque loads as well as external forces encountered throughout operation. The rear axle is designed to allow  $\pm 12^\circ$  oscillation. All four wheels remain on the ground over uneven terrain providing excellent stability and traction.



**Integrated Braking System.** The Cat exclusive Integrated Braking System reduces axle oil temperatures and improves transmission neutralizer smoothness. IBS has a direct impact on durability of the axles and brakes especially in applications involving long distances and/or heavy braking.

- A** Downshift logic only
- B** Brake application initiated
- C** Self-adjusting transmission neutralization

**Structures.** The articulated frame design of the 938H features a durable plate engine frame and two plate loader tower that is robotically welded. Robotic welding creates frame joints with deep plate penetration welds and excellent fusion for maximum strength and durability.

**Linkage.** The 938H linkage is a single-tilt Z-bar design. Z-bar linkage generates excellent breakout force and good rack back angle for better bucket loading and load retention. Lift arms are solid steel, providing superior strength with an excellent front end viewing area. The proven design offers excellent dump clearance and reach.



**Counterweight.** The two-piece counterweight is integrated into the 938H design and provides added protection for the lights by incorporating them into the top of the structure.

**Caterpillar Designed Components.**

Components used to build Cat Wheel Loaders are designed and manufactured to Caterpillar quality standards to ensure maximum performance even in extreme operating conditions.

Engine electronic control modules and sensors are completely sealed against moisture and dust. Deutsch connectors and electrical wire braiding ensure that electrical connections resist corrosion and premature wear.

Hoses are engineered and manufactured for high resistance to abrasion, excellent flexibility and easy installation and replacement.

Caterpillar® couplings use o-ring face seals to provide positive sealing for durable leak-free connections.

Heavy duty components reduce the risk of leaks, corrosion and premature wear, increasing uptime and helping to protect the environment.

**Monitoring Programs.** Monitoring product health is key to maintaining reliability of any equipment. Many programs are available on the 938H to help you track machine health.

# Productivity and Versatility

*Work Smart And Move More*



- Hydraulics are easy to control with low effort
- Differential locks provide maximum traction in varying underfoot conditions
- Constant net horsepower across various applications
- Standard and optional features that maximize productivity

### Load-Sensing Hydraulics.

The 938H features a Load-Sensing hydraulic system that supplies flow and pressure for the implements only upon demand, and only in the amounts necessary to perform the needed work thus providing a more efficient loader.

With the new S3PC Priority Proportional Pressure Compensation Valve, implement control is improved over the previous system – raise/lower and rack back/dump can be operated simultaneously.

Operators will notice enhanced ease of operation, more rimpull into the pile and a 16% increase in lift force.



**Constant Net Horsepower.** On many competitive machines, gross horsepower is constant, meaning that net engine power available for actual work will vary based on demands made from parasitic sources, such as air conditioning or cooling fans. The Cat C6.6 engine is electronically configured to provide constant net horsepower at full parasitic load enhancing productivity and improving fuel efficiency.



**New! Differential Lock.** Maximize productivity with the new hydraulic locking front differential. This standard feature provides operators with the confidence to maneuver through poor underfoot conditions with 'on the fly' engagement.

A Caterpillar exclusive, the optional automatic front/rear locking differential collects input from sensors throughout the loader and adapts tractive effort to meet operating requirements.



### Countershaft Powershift Transmission.

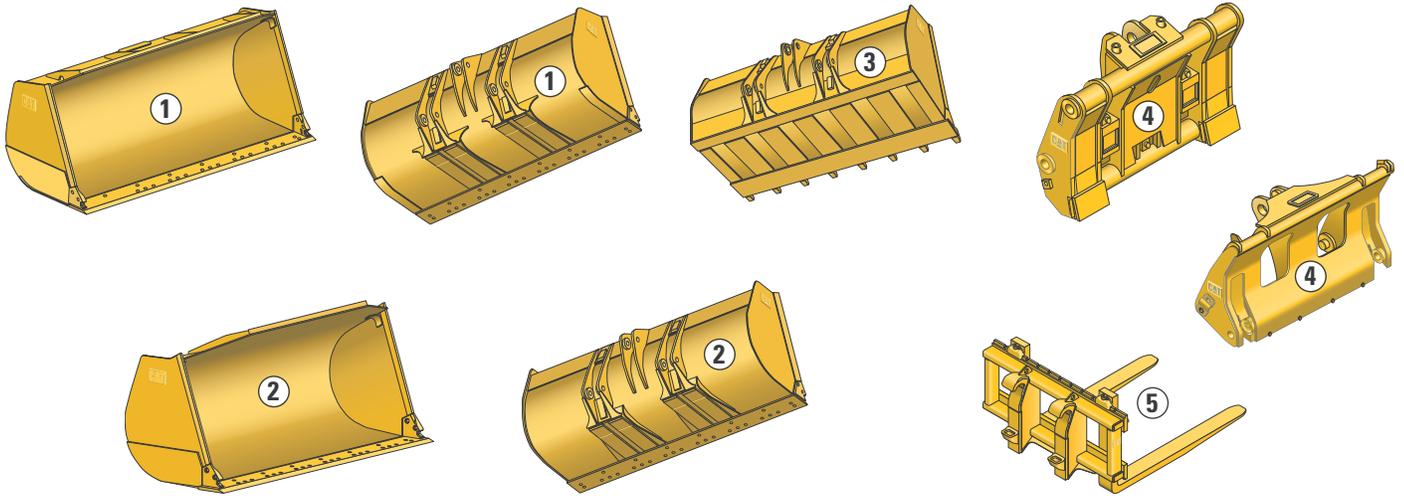
The electronic countershaft powershift transmission with automatic shift capability is designed and built by Caterpillar. The very responsive, full-power speed and directional changes provide excellent cycle times and productivity.

**Fuel Economy Mode.** Match transmission shifting patterns to machine application requirements. The Fuel Economy Mode (within Messenger) provides operators with the ability to choose between three different shift modes in order to maximize shift quality and fuel efficiency.



**Ride Control.** The optional Ride Control System improves ride, performance and load retention when traveling over rough terrain. Operators gain confidence moving at higher speeds in load and carry operations decreasing cycle times and increasing productivity.

**Variable Shift Control.** Match transmission shifting patterns to machine application requirements. Variable Shift Control (VSC) improves shift quality and fuel efficiency in certain applications by allowing the transmission to upshift at lower engine RPMs.



**1 Standard Universal Buckets.**

These flat floor buckets, equipped with various Ground Engaging Tools, provide easier pile penetration, better fill factors and faster loading cycles; they are offered in a wide range of capacities and are recommended in all applications, except fulltime bank or rock loading. All buckets feature integral spill plates to prevent rear spillage, as well as, bottom and side wear plates for greater durability.

**2 General Excavation Buckets.**

Built to handle the toughest conditions, these slope floor buckets feature a well proven, shell-tine construction design that resists twisting and distortion and are excellent for bank and excavation applications. Bucket hinges are part of a structure that extends under the bucket shell to the cutting edge,

forming box sections. These structures act as protection against impact and twisting forces. All buckets have integral spill plates that prevent rear spillage, keeping material away from the linkage. Hardened weld-on rear wear plates protect the bottom of the bucket for greater durability. Bucket side plates are also reinforced in their lower portion with additional wear plates for longer life.

**3 Universal Buckets with Back Grading Edge.**

In this configuration, an additional full-width box-section profile with a wear edge is welded at the back of the bucket floor. The bucket base edge and the additional rear edge are at the same level, providing better grading capabilities. This bucket can be fitted with welded flush mounted adapters and tips still allowing excellent grading capability.

**4 Quick Couplers.** They provide unmatched versatility and allow one operator with one machine to perform a wide variety of tasks, resulting in greater machine performance and cost efficiency. Use the dedicated quick coupler actuation circuit (optional) to activate the quick coupler and change mechanical tools without leaving the cab. Having a dedicated circuit also leaves the third valve solely to actuate hydraulic tools without the need for diverter valves.

**5 Pallet Forks (PS).** Pallet forks are the ideal tools for handling a variety of materials.

## Operator Comfort

*Work Comfortably And Efficiently*



- Comfortable operation
- Excellent visibility
- Easy entry and exit
- Low effort steering

**Operating Environment.** The 938H provides operators with a comfortable operating environment with generous storage space and excellent visibility.

**Seat.** The durable seat adjusts 6-ways to accommodate all sized operators. The seat features an automotive style lumbar support for maximum comfort. The Cat C-500 Series Comfort air-suspension seat is optional as is a heated backrest and seat cushion.

**Visibility.** The 938H offers excellent visibility to the front and rear of the machine. Distortion-free flat glass stretches to the floor of the cab for excellent visibility to the bucket. Wet-arm wipers on both front and back keep the windows clean in any condition.

**Rear Vision Camera.** An optional rear vision camera is available to clearly monitor movement behind the wheel loader.

**Lighting Packages.** In addition to the standard roading lights, optional lighting packages are available for low-light applications. Optional auxiliary halogen or High Intensity Discharge (HID) cab lights provide exceptional lighting for night work. A rotating beacon is available as a safety feature.



**Implement Control Pod.** The newly restyled implement pod provides superior comfort through the full length adjustable armrest. Standard transmission F-N-R switch allows operators to keep their hand on the implement control levers while making directional shifts. An optional joystick with integrated F-N-R switch is available and replaces the lift and tilt levers.



**Steering.** Caterpillar's low effort Load-Sensing steering directs power through the steering system only when needed. The new hand metering unit and priority valve provide operators with full steering and multi-function capability at low engine RPM's. The combined steering column and instrument panel tilt for maximum operator comfort.

**Controls.** Key machine controls are conveniently located within arms reach and allow better efficiency while minimizing operator fatigue. A variety of machine controls are also contained within the Messenger display. By accessing various menus, an operator can tailor the machine to fit operating style and application. For multi-shift operations, personalized settings for each operator can be established and stored for maximum uptime and comfort.



**Entry and Exit.** A ladder with aggressive tread pattern keeps debris build-up to a minimum. The ladder is at a 5° forward incline for easy entry and exit. The main cab door opens a full 180° and latches in place to allow safe navigation to the rear of the machine. The right side door opens 10°, or completely for secondary exit simply by pulling a pin. A full-length ladder on the right side facilitates safe exit if needed.

## Serviceability

*Easy To Maintain – Easy To Service.*

- Grouped service points and sight gauges for easy daily maintenance
- Convenient access to engine compartment for excellent serviceability
- Swing-out grill and cooling cores for easy cleaning
- Electronic systems to monitor product health

**New! Multi-Piece Axle.** With the introduction of Caterpillar's new multi-piece axles, service brakes and final drives are located outboard and provide easy access when service is required.

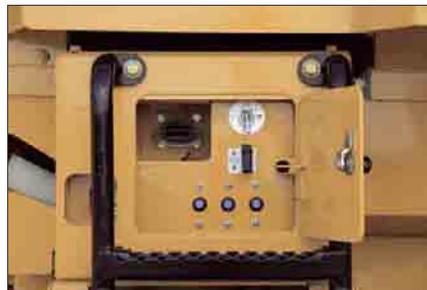
**Autolube.** Reduce time spent on daily maintenance and downtime for unplanned repairs due to inadequate greasing with the optional Caterpillar Automatic Lubrication System. Precise lubrication of pins and bushings at specific intervals improves component wear and reduces ground contamination from excessive greasing.



**Hydraulic Service Center.** Transmission and hydraulic oil filters are located in the Hydraulic Service Center, behind the hinged, right-side access ladder. The hydraulic oil tank can be drained from this location using the access port.



**Ground Level Grease Points.** Grease fittings are grouped on the right side of the machine in two convenient locations thus facilitating easy lubrication of vital components throughout the machine.



**Electric Service Center.** A lockable compartment located just below the left side access platform contains key electrical components such as the remote jump-start receptacle, battery disconnect switch, circuit breakers and hood actuation switch. The maintenance free batteries are conveniently located under the Electric Service Center .

**S•O•S<sup>SM</sup> Services.** Keep minor repairs from becoming major ones and avoid complete failures. By regularly taking samples from the ports provided, your Cat dealer tracks wear of components and parts, oil performance, and oil condition and uses that data to predict wear-related problems before they happen. Often a simple adjustment or replacement of a part, based on S•O•S reports, can keep a small problem from turning into a major repair – allowing your machine to be running when you need it, not waiting in the shop for service. Sampling valves on the 938H allow quick access to engine, transmission and hydraulic oils for S•O•S analysis. Oil change intervals and other services can be optimized according to your work schedule, reducing downtime and managing expenses.

**Brake Wear Indicators.** Axles are equipped with standard brake wear indicators, allowing a technician to easily determine when it is necessary to service the brakes.

**Sight Gauges.** Well-protected, yet easily visible sight gauges for the transmission, hydraulic oil and radiator coolant allow easy daily checks while reducing the risk of contaminants entering the systems.

**Fuel Priming Pump.** An electrical fuel priming pump is located between the fuel tank and the combined water separator/primary fuel filter. The electric priming pump eliminates the need to pre-fill or manually prime filters after a change, thus reducing contamination and improving injector life.

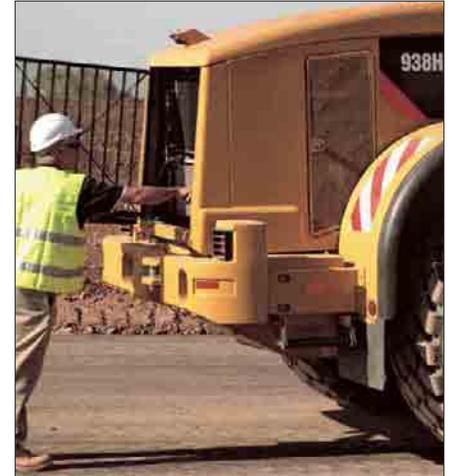
**Cat Product Link.** With Product Link customers and dealers can remotely obtain machine diagnostics. The system provides updates on service meter hours, machine health and equipment location.



**Engine Compartment Access.**

A single mechanical lift cylinder with manual back-up opens the hood. The tilting hood provides excellent

access to the engine and cooling compartments and if necessary, the entire hood can be removed with the built-in lift points.



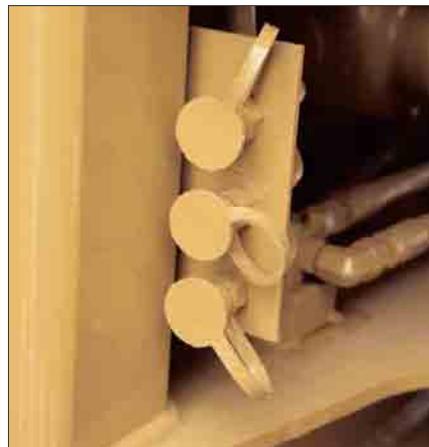
**Cooling System.**

Cooling system access for clean-out and maintenance is outstanding. The perforated and corrugated grill minimizes debris build-up and swings out for easy cleaning and access to the cooling cores. The full-width air conditioning condenser and oil cooler cores swing out 45° to allow easy cleaning of the rear radiator face. An access panel located on the right side of the radiator support structure provides access to the front face of the radiator and ATAAC cores for easy cleaning.



With the hood closed, quick checks of the engine oil level, coolant site gauge and air inlet indicator can be completed through the side service door.

**Ecology Drains.** Engine, transmission and hydraulic oils can be easily drained with standard-equipment ecology drains. An axle oil ecology drain is optional.



**Remote Pressure Taps.** Pressure taps for key systems are grouped and centrally located throughout the machine and help facilitate quick diagnostics.

**Electric Priming Pump.** An electric fuel priming pump located on the primary fuel filter base eliminates the need to pre-fill or manually prime filters after a change, eliminating engine contamination.

**Service Capabilities.** Cat field service technicians have the experience and tools necessary to service your loader on site. Field service trucks are fully loaded with state-of-the-art tools and diagnostic equipment as well as specifications and schematics for every Cat machine. Technical experts at the dealership and Caterpillar are available to provide assistance to field service technicians when needed.

# Owning and Operating Cost

## The 938H – Best Value For Your Operation

- Sight gauges, grouped maintenance points, easy engine access, ecology drains, maintenance-free batteries – all simplify daily maintenance
- Electronic monitoring systems track product health to avoid unscheduled costly repairs
- Unsurpassed parts availability reduces downtime
- Excellent resale value provided by genuine Cat quality, outstanding dealer service and unmatched dealer support programs
- Caterpillar Financial Services and Cat dealers understand your business

### Engine Idle Management System.

The Engine Idle Management System (EIMS) maximizes fuel efficiency and provides flexibility in managing idle speeds for specific application requirements. Four controlled idle speeds are available.

- **Hibernate Mode.** Idle speed drops after a preset time to provide lower fuel consumption, reduced sound levels and lower emissions.
- **Work Mode.** Adjustable working idle speeds according to customer preference and operating conditions.
- **Warm-Up Mode.** Keep the engine at a consistent temperature in cold conditions.
- **Low Voltage Mode.** Prevent battery drain due to high electrical loads from attachments and accessories.

**Maintenance.** Proper maintenance of your wheel loader can help control expenses and lower your owning and operating costs. The 938H provides unmatched serviceability by offering:



- Hydraulic service center
- Electric service center
- Airborne debris-resistant, swing-out grill provides more efficient airflow
- Well-protected, easily visible sight gauges
- Ground level maintenance points
- Easy access to engine compartment
- Ecology drains for simple and clean fluid drainage
- Brake wear indicators for ease of inspection
- Maintenance-free batteries
- Extended oil and filter change intervals

**Monitoring Systems.** Monitoring product health simplifies maintenance planning and reduces costs.

**Cat Product Link.** With Product Link customers and dealers can remotely obtain machine diagnostics. The system provides updates on service meter hours, machine health and equipment location.



**Cat Messenger.** Messenger offers the comfort of providing real-time, visual feedback on engine and machine operating conditions. It displays information on diagnostic codes, maintenance and system parameters.

### Cat EquipmentManager.

EquipmentManager uses key indicators from equipment such as hours, location and diagnostic codes and combines them with powerful tools like mapping, maintenance and repair scheduling as well as troubleshooting instructions. This application enables quick identification of actions required to maximize equipment uptime and control owning and operation costs.

**Cat Machine Security System.** Stolen equipment equates to lost production and increased costs. Eliminate machine theft and unauthorized usage with the Cat Machine Security System (MSS). MSS is integrated into the machine's electronic system and can protect most brands of equipment by requiring a uniquely coded key to start the machine.

**S•O•S Services.** Managing component life and machine availability decreases downtime while improving your productivity and efficiency. S•O•S Services can help you do that. Regular fluid sampling is used to track what is going on inside the equipment. Wear-related problems are predictable and easily and quickly repairable. Maintenance can be done according to your schedule, resulting in increased uptime and flexibility in maintenance and repair before failure.



**Dealer Support.** The Caterpillar global network of independently-owned dealers is the best in the world at providing support to keep your loader up and running. Known for parts availability and technical expertise, Cat dealers are partners in your business.



**Parts Availability.** Caterpillar provides an unsurpassed level of personalized service for your wheel loader. With parts distribution centers worldwide, most parts can be delivered in 24 hours. Easy access to parts reduces downtime.

**Resale Value.** Owning quality equipment is a very important factor in maintaining resale value. Cat not only supplies quality equipment but also provides product and dealer support to maintain the reliability and durability of your machine.

**Customer Support Agreements.** A Customer Support Agreement (CSA) is any arrangement between you and your Cat dealer that helps you lower your total cost per unit of production. CSAs are flexible, allowing them to be tailored to your business. They can range from simple Preventive Maintenance Kits to sophisticated Total Cost Performance Guarantees. Having a CSA with your Cat dealer allows you more time to do what you do best – run your business.

**Caterpillar Equipment Training Solutions.** A thorough understanding of machine systems and a high level of skill in operation helps achieve maximum efficiency and improves return on investment. Caterpillar Equipment Training Solutions programs help provide operators with high levels of proficiency and confidence. Contact your Cat Dealer for more information on Caterpillar Equipment Training Solutions programs.

**Caterpillar Financial Services Corporation.** Cat Financial understands your business, your industry and the challenges you face. That's why they can provide payment plans to fit your unique needs – and to help you achieve your goals.

## Engine

Cat C6.6 with ACERT Technology

Gross Power 147 kW/200 hp

Net Power at 2100 rpm

ISO 9249 134 kW/182 hp

80/1269/EEC 134 kW/182 hp

Peak Torque (net) at 1400 rpm 840 Nm

Total Torque Rise 38%

Bore 105 mm

Stroke 127 mm

Displacement 6.6 liter

- All engine horsepower (hp) are metric including front page.
- EU Stage IIIA compliant
- Rating for net power advertised based on power available when the engine is equipped with alternator, air cleaner, muffler and on-demand hydraulic fan drive at maximum fan speed.

## Operating Specifications

Operating Weight 15 500 kg

Static Tipping Load,

Full Turn 10 200 kg

Breakout Force 123 kN

Bucket Capacities 2.3 to 3.0 m<sup>3</sup>

- Operating weight with 2.8 m<sup>3</sup> universal bucket and bolt-on cutting edge.

## Axles

Front Fixed

Rear Oscillating ± 12°

Maximum Single-Wheel Rise and Fall 420 mm

## Sound

### Operator Sound

The dynamic operator sound pressure level measured according to ISO 6396:1992 is 73 dB(A) for a cab offered by Caterpillar, when properly installed, maintained and tested with doors and windows closed.

### Exterior Sound

The European Union 2000/14/EC labeled exterior sound power level is 105 dB(A) for the machines certified to that requirement.

For the standard machine configuration, the sound power level is 109 dB(A) measured according to the dynamic test procedure and conditions specified in ISO 6395:1988.

## Hydraulic System

Implement System

Pump Output 295 l/min

Hydraulic Cycle Times seconds

Raise 5.4

Dump 1.4

Lower, Empty, Float Down 2.7

Total 9.5

- Implement system, (standard) piston pump (rated at 2100 rpm and 70 bar)
- Cycle times with rated payload

## Service Refill Capacities

Fuel Tank 247 Liters

Cooling System 36

Crankcase 17

Transmission 43

Differentials and Final Drives

Front 57

Rear 53

Hydraulic Tank 89

## ROPS/FOPS

- Caterpillar cab with integrated Rollover Protective Structure (ROPS) is standard in Europe.
- Rollover Protective Structure ROPS meets ISO 3471:1994 criteria.
- Falling Objects Protective Structure (FOPS) meets ISO 3449:1992 Level II criteria.

## Brakes

Meet ISO 3450:1996 standard.

## Transmission

Forward	km/h
1	8
2	15
3	26
4	43

Reverse	
1	8
2	15
3	26

- Maximum travel speeds (20.5 R 25 tires)

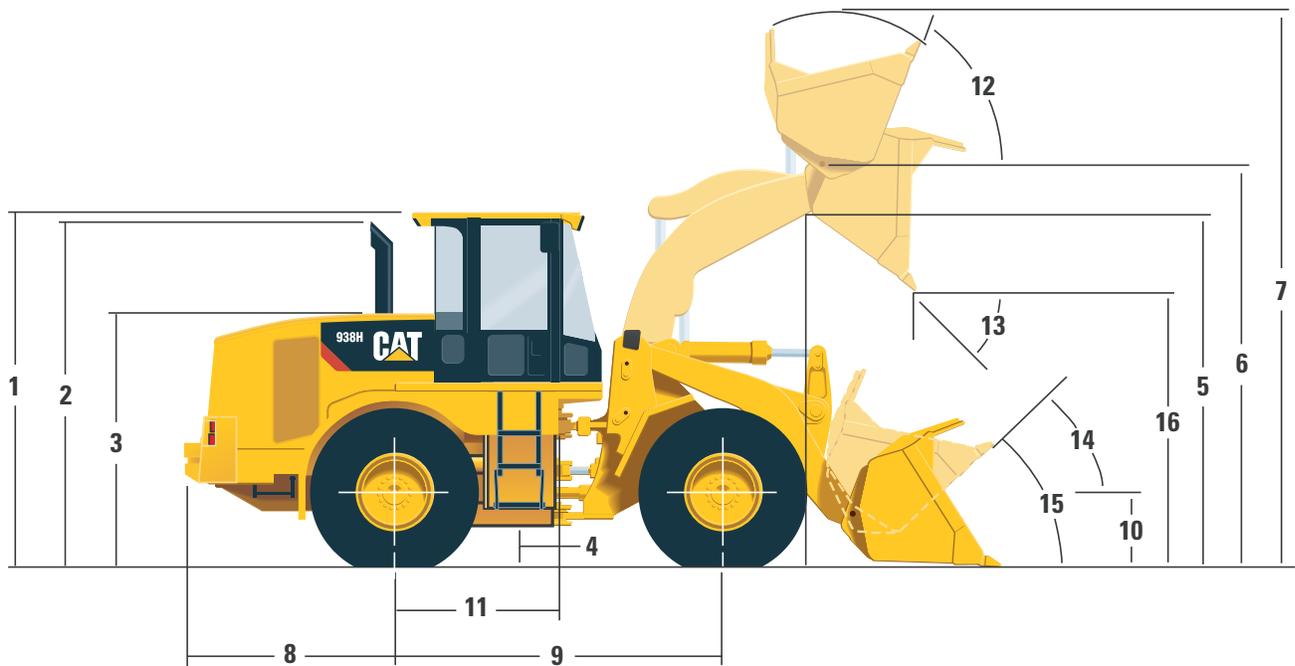
## Tires

20.5 R 25, L-3 XHA  
20.5 R 25, L-3 GP2B  
650/65 R 25, L-3 XLD  
(Low Profile)

In certain applications (such as load and carry) the loader's productive capabilities might exceed the tires' tonnes-km/h capabilities. Caterpillar recommends that you consult a tire supplier to evaluate all conditions before selecting a tire model. Other special tires are available on request.

## Dimensions

All dimensions are approximate



	mm		mm
<b>1</b> Height to top of ROPS	3356	<b>10</b> Height to center line of axle	688
<b>2</b> Height to top of exhaust pipe	3099	<b>11</b> Center line of rear axle to hitch	1510
<b>3</b> Height to top of hood	2415	<b>12</b> Rack back at maximum lift	65°
<b>4</b> Ground clearance with 20.5 R 25, L-3	397	<b>13</b> Dump angle at maximum lift	50°
<b>5</b> Lift arm clearance at maximum lift	3435	<b>14</b> Rack back at carry	50°
<b>6</b> Bucket hinge pin height	3843	<b>15</b> Rack back at ground	42°
Bucket hinge pin height, optional high lift	4266	<b>16</b> Dump clearance at maximum lift and 45° dump	2771
<b>7</b> Overall height – bucket raised	5284		
<b>8</b> Center line of rear axle to edge of counterweight	1869		
<b>9</b> Wheelbase	3020		

## Tire Specifications

	Width over tires	Change in vertical dimensions	Change in operating weight	Change in static tipping load
	mm	mm	kg	kg
20.5 R 25, L-3 (XHA)	2674	0	0	0
20.5 R 25, L-3 (GP2B)	2619	+6	-53	-37
650/65 R 25, L-3 (XLD) (Low Profile)	2733	0	+519	+36

# Operation Specifications

		General Excavation Buckets					
		Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments
Rated bucket capacity	m <sup>3</sup>	2.3	2.3	2.5	2.5	2.8	2.8
Struck capacity	m <sup>3</sup>	2.0	2.0	2.1	2.1	2.4	2.4
Width	mm	2700	2777	2700	2777	2700	2777
Dump clearance at full lift and 45° discharge <sup>4</sup>	mm	2889	2786	2849	2744	2771	2664
Reach at full lift and 45° discharge <sup>4</sup>	mm	993	1098	1019	1123	1077	1179
Reach with lift arms horizontal and bucket level <sup>4</sup>	mm	2189	2336	2239	2386	2339	2486
Digging depth	mm	50	50	50	50	50	50
Overall length <sup>4</sup>	mm	7193	7351	7243	7401	7343	7501
Overall height with bucket at full raise	mm	5140	5140	5188	5188	5284	5284
Loader turning radius with bucket in carry position	mm	11 946	12 104	11 971	12 131	12 024	12 185
Bucket weight	kg	1186	1294	1219	1327	1290	1398
Static tipping load straight <sup>1</sup>	kg	12 193	12 096	12 113	12 016	11 948	11 849
Static tipping load at 37° articulation <sup>1</sup>	kg	10 640	10 543	10 566	10 468	10 410	10 311
Breakout force <sup>2</sup>	kN	142	141	135	134	123	122
Operating weight <sup>1</sup>	kg	15 339	15 414	15 373	15 448	15 446	15 521

<sup>1</sup> Static tipping load and operating weight shown are based on average machine configuration with sound suppression cab and ROPS, secondary steering, air conditioning, ride control, roading fenders, autolube, back-up alarm, 20.5 R 25, L-3, tires, full fuel tank, coolant, lubricants, lights, directional signals, CE plates and operator.

<sup>2</sup> For buckets with adapters, tips and segments, value is measured 100 mm behind the tip of the segment, with bucket hinge pin as pivot point, in accordance with SAE J732C.

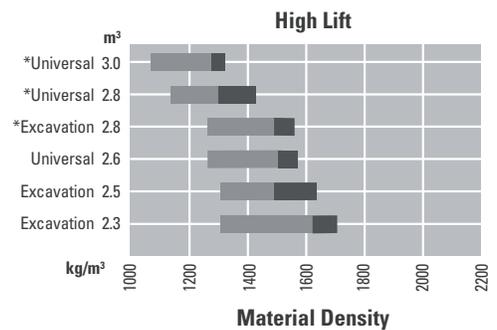
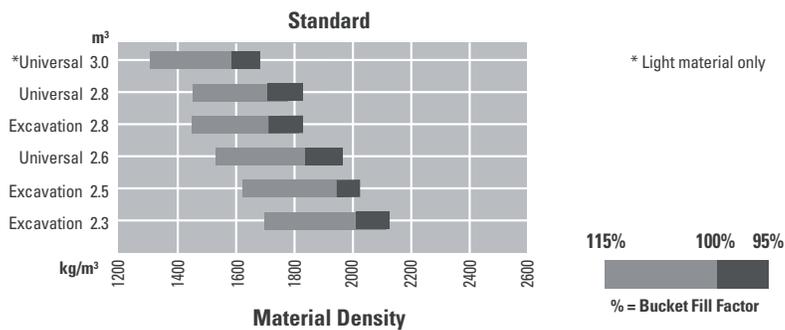
<sup>3</sup> All buckets shown can be used on the high lift arrangement. High lift column shows changes in specifications from standard lift to high lift. Add or subtract as indicated to or from specifications given for appropriate bucket to calculate high lift specifications.

**Dimensions for dump clearance, reach and overall length:**

<sup>4</sup> Actual dimensions taken at the tip of the Ground Engaging Tools, either the tip of the bolt-on cutting edge or the tip of the teeth, type long.

	Universal Buckets						High Lift <sup>3</sup>
	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments	
	2.6	2.6	2.8	2.8	3.0	3.0	same
	2.2	2.2	2.5	2.5	2.6	2.6	same
	2706	2777	2706	2777	2706	2777	same
	2738	2624	2696	2582	2654	2540	+423
	934	1028	976	1070	1019	1113	+112
	2279	2426	2339	2486	2399	2546	+381
	85	85	85	85	85	85	+58
	7312	7470	7372	7530	7432	7590	+482
	5022	5022	5081	5081	5141	5141	+423
	12 026	12 180	12 058	12 213	12 090	12 245	+517
	1334	1475	1380	1521	1429	1570	same
	11 768	11 668	11 676	11 575	11 583	11 481	-2005
	10 254	10 154	10 167	10 066	10 078	9977	-1798
	130	129	123	122	116	115	-6
	15 429	15 506	15 476	15 553	15 524	15 601	+259

## Bucket Selection Guide



## Standard Equipment

Standard equipment may vary. Consult your Caterpillar dealer for specifics.

### Electrical

Alarm, back-up  
Alternator (24 V, 65 A)  
Ignition key start/stop switch  
Lighting System:  
    Four halogen working lights;  
    two halogen roading lights  
    with signals  
Receptacle start (cables not included)  
Starter, electric (heavy duty)  
Switch, battery disconnect

### Operator Environment

Beverage / lunchbox holders  
Bucket / work tool function lockout  
Cab ROPS/FOPS, pressurized and  
    sound suppressed  
Cab heater and defroster  
Coat hook  
Controls, lift and tilt functions  
Electric horn, dual actuating:  
    steering wheel and implement pod  
Instrumentation, Gauges:  
    Engine coolant temperature  
    Fuel level  
    Hydraulic oil temperature  
    Speedometer, gear and service meter  
    Tachometer  
    Transmission oil temperature  
Instrumentation, Warning Indicators:  
    Brake charge pressure low  
    Electrical system voltage low  
    Engine oil pressure low  
    Hydraulic oil filter bypass  
    Parking brake applied  
    Primary steering malfunction  
    Transmission oil filter bypass  
    Light, dome (cab)  
    Messenger

Mirrors, rearview: internal and external  
Power outlets; two 12 V, 5 A includes  
    cigar lighter  
Radio ready, includes antenna, speakers  
    and converter 12 V, 5 A  
Seat KAB (cloth) with mechanical  
    suspension  
Seat belt, retractable, (50 mm wide)  
Steering column, tilting  
Storage compartment  
Sun Visor, Front  
Switch, F-N-R (located on implement  
    pod)  
Wet-Arm windshield wipers; front and  
    rear (interval functionality)  
Window, Sliding (left and right side)

### Power Train

Axle oil cooler ready  
Brakes, full hydraulic enclosed wet-disc  
    with Integrated Braking System (IBS)  
Brake wear indicators  
Differential Lock, Front Manual  
Open Differential rear  
Drive line, extreme service  
Engine, Cat C6.6 with ACERT  
    Technology and ATAAC  
Fan, radiator, electronically driven,  
    temperature sensing on demand  
Filters, fuel, primary/secondary  
Fuel priming pump (electric)  
Fuel/Water separator  
Monitoring System, axle oil  
    temperature  
Muffler, sound suppressed  
Radiator, unit core with ATAAC  
Starting aid (glow plugs)  
Torque converter  
Transmission neutralizer lockout  
Transmission, countershaft, automatic  
    power shift (4F/3R)  
Variable Shift Control (VSC)

### Other Standard Equipment

Counterweight  
Fenders, Extension Platform Rear  
Fenders, steel (front and rear)  
Grill, airborne debris  
Guards (bottom crankcase and  
    fuel tank)  
Hitch, drawbar with pin  
Hood, 1-piece, non-metallic power  
    tilting  
Hoses, Caterpillar XT  
Hydraulics, Load-Sensing  
Kickout, lift, adjustable  
Kickout, tilt, adjustable  
Linkage, Z-Bar, crosstube/tilt lever  
Oil sampling valves  
Remote Diagnostic Pressure Taps  
Sight Gauges: Engine coolant, hydraulic  
    oil and transmission oil level  
Steering, Load-Sensing  
Vandalism protection caplocks

### Tires, Rims, Wheels

A tire must be selected from the mandatory attachments section. Base machine price includes an allowance based on a premium brand tire.

### Antifreeze

Premixed 50% concentration extended life coolant; freeze protection to -35 °C.

## Optional Equipment

Optional equipment may vary. Consult your Caterpillar dealer for specifics.

Antifreeze, -50 °C  
Autolube  
Buckets and work tools  
Bucket Ground Engaging Tools – see  
Cat dealer for details  
Camera, rear view  
Cooler, axle oil  
Differential Lock, automatic front and  
rear  
Drain, axle ecology  
Ether Starting Aid  
Fenders, roading  
Guards, axle seal  
Guard, front window, wide mesh  
Guard, power train bolt-on  
Guard, power train hinged  
Guard, hitch area  
Guard, front driveshaft  
Guard, roading light, front and rear  
Guard, tilt cylinder  
Guard, transmission oil fill  
Heater, engine coolant, 120 or 230 V  
High Lift, three-valve  
High Lift, three-valve with hydraulic  
horizontal pin quick coupler

Hydraulics, three or four-valve  
Joystick control, two, three or  
four valve  
Ladder, cable  
Lights, auxiliary cab lights  
Lights, high intensity discharge (HID)  
Light, rotating beacon  
Machine Security System  
Mirrors, heated external  
Open canopy  
Precleaner , turbine  
Precleaner , turbine/trash  
Quick Coupler, hydraulic horizontal pin  
Quick Coupler ready lines  
Radio, AM/FM CD player  
Ride Control  
Seat, air suspension  
Seat, heated air suspension  
Seatbelt, 75 mm wide  
Seatbelt, 75 mm wide (KAB)  
Steering, secondary  
Sunscreen, rear  
Toolbox

### Regional Package Europe

Certified 2000/14/EC Sound Power  
required for EEC and EFTA applications  
– Conversion CE (Secondary Steering,  
Sound Suppression)  
– Powertrain Guard, Bolt-on  
– Front fenders, flat design  
– Product Link  
– Air Conditioning

### Regional package AME/CIS

– Powertrain Guard, Bolt-on  
– Precleaner, Turbine  
– Front fenders, flat design  
– Air Conditioning  
– Cooling, High Ambient

# 938H Wheel Loader

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)

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

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