

938H

Wheel Loader



Engine

Engine Model	Cat® 6.6 ACERT™	
Net Power – SAE J1349	128 kW	172 hp
Net Power – ISO 9249	134 kW	180 hp

- Caterpillar® engine with ACERT™ Technology – EPA Tier III, EU Stage III Compliant.

Buckets

Bucket Capacities	2.3 - 3.0 m ³	3.0 - 4.0 yd ³
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Weights

Operating Weight	15 059 kg	33,190 lb
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- For 2.8 m³ (3.65 yd³) general purpose bucket with standard 20.5-R25 tires.

Operating Specifications

Static Tipping Load, Full Turn	10 076 kg	22,207 lb
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- For 2.8 m³ (3.65 yd³) general purpose bucket with standard 20.5-R25 tires.

938H Wheel Loader

Setting the standard for wheel loader productivity, durability, versatility and comfort.

RELIABILITY

- Proven Components and Technology
- Diagnostic Systems Monitor Product Health to Ensure Reliability
- Unmatched Parts Availability and Dealer Support **pg. 4**

DURABILITY

- ✓ • 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 **pg. 6**

PRODUCTIVITY

- ✓ • 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 **pg. 8**

OPERATOR COMFORT

- ✓ • Easy Entry and Exit
- Excellent Visibility
- Adjustable Machine Parameters to Match Operator Preference **pg. 14**



VERSATILITY

- Special Machine Arrangements for Unique Applications
- Large Variety of Cat® Work Tools
pg. 9

OWNING AND OPERATING COSTS

- Superior Maintenance
- Electronic Systems Monitor Product Health and Performance
- Complete Dealer Support **pg. 10**

SERVICEABILITY

- ✓ • Service Centers for Convenient Maintenance
- Exceptional Ground-Level Access to Service Points
- ✓ • Monitoring Systems and Dealer Support Reduce Unexpected Downtime **pg. 12**



✓ *New Feature*

RELIABILITY

The Cat 938H – 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.



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. Deutsche 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.

Caterpillar Messenger Display.

The 938H is equipped with the Caterpillar Messenger Display that keeps watch over the health of your loader while providing real-time diagnostic feedback. In the event of a system malfunction, Messenger will provide the operator with a description of the occurrence, and if serious enough, sound an audible alarm in addition to a flashing indicator light.

Product Link. Standard equipment on the 938H, this state-of-the-art satellite technology enables Caterpillar dealers and customers to keep in touch with their machines. The system provides a two-way information flow between machine on-board systems and Caterpillar dealers/customers via the Cat Dealer Website and EquipmentManager.

EquipmentManager. EquipmentManager is a web-based application that uses key indicators from your equipment such as hours, location and diagnostic codes and combines it with powerful tools like mapping, maintenance and repair scheduling, and troubleshooting instructions. This application enables quick identification of actions required to maximize your equipment uptime and control owning and operating costs.

S•O•SSM 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.



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.

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.

When on-site repair isn't enough, Cat dealerships are fully-equipped to service your loader quickly.

Parts Availability. Caterpillar provides an unsurpassed level of personalized service for your wheel loader. With parts distribution centers throughout the world, most parts can be delivered in 24 hours.

Remanufactured Parts. Cat engines and major components are designed to be remanufactured and provide multiple life cycles. The Cat Reman program is more extensive than most rebuild programs. Components are actually remanufactured in the factory to original specifications with necessary product updates.

Strict reuse guidelines and unparalleled quality control ensure that reman products provide the reliability and durability that you expect from Caterpillar. Reman products are stocked in distribution centers around the world and are ready to install to minimize downtime, maintain productivity and profitability.

DURABILITY

Built Strong and Tough

- ACERT™ Technology maintains engine performance, efficiency and durability while reducing emissions
- Heavy duty components withstand all operating conditions
- Strong, solid structures are built to last



Cat C6.6 ACERT. The Cat C6.6 is a 6.6 liter (403 in³) 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.

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.

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

POWERSHIFT TRANSMISSION.

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

Control 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.

RADIATOR. Brazed aluminum construction provides a stronger joint for maximum durability and resistance to leaks. The 6-fins-per-inch design decreases the chance of blockage and plugging.

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.

Engine End Frame (EEF). The 938H uses a proven solid plate engine end frame which provides a strong, rigid structure that resists twisting and evenly distributes impact loads. The result is an extremely solid mounting platform for the engine, transmission, axle, ROPS and other accessories.



Hitch. The distance between the upper and lower hitch plates is an important contributor to machine performance and component life. The Caterpillar hitch design provides excellent load distribution and bearing life. Both the upper and lower hitch pins pivot on double tapered roller bearings – improving durability by distributing both vertical and horizontal loads over a larger surface area. The wide opening also provides excellent service access.

Non-Engine End Frame (NEEF).

The non-engine end frame provides a solid mounting base for the front axle, lift arms, lift cylinders and tilt cylinder. The fabricated, two-plate loader tower design reduces material packing under the lift cylinders while absorbing the forces associated with loading, twisting and material handling.



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.

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.

PRODUCTIVITY

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.



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.

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.

On-Demand Fan. With electronic control of the variable speed on-demand fan, temperature levels of the engine coolant, transmission oil, hydraulic oil and air inlet manifold are constantly monitored. This data is used to control and maintain fan speed at the level necessary to maintain normal system temperatures. Controlled fan speed improves fuel efficiency, lowers noise levels and reduces radiator plugging.

Isolated Cooling System. The 938H cooling system is isolated from the engine compartment by a non-metallic shield. The hydraulically driven, variable speed fan draws in clean air from the rear of the machine and exhausts it out the sides and top of the hood. The end results are optimal cooling efficiency, increased fuel efficiency, less radiator plugging and reduced operator sound levels.



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.



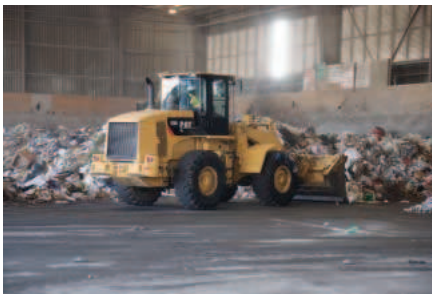
RIDE CONTROL. The optional Ride Control System improves ride, performance and load retention when traveling over rough terrain. Operators gain confidence moving at higher speeds in load and carry operations decreasing cycle times and increasing productivity.

AUTOLUBE. The optional Caterpillar Autolube System provides precise, automatic lubrication of pins and bushings – during loader operation. Automatic lubrication reduces time spent on daily maintenance and downtime for unplanned repairs due to inadequate greasing – improving productivity.

VERSATILITY

Built For Your Operation

- A variety of buckets and work tools for many applications



WORK TOOLS AND QUICK COUPLERS.

A variety of buckets, work tools and couplers are available from the factory or from your Caterpillar dealer to customize the 938H for your operation.

Quick Couplers. Quick couplers provide unmatched versatility for wheel loaders. Buckets and work tools can be changed in seconds without leaving the cab for maximum productivity.



General Purpose Buckets. General Purpose Buckets provide good all-around performance for stockpiling, rehandling, excavating and bank loading. A heavy duty General Purpose Bucket can be used for more aggressive applications.

Material Handling Buckets. The Material Handling Bucket is a flat-floor bucket used for handling stockpiled materials such as aggregates or other easy-to-load materials requiring moderate breakout force.

Coal Buckets. Coal Buckets maximize productivity in loading and stockpiling coal and other materials of similar density.

Waste Buckets. Waste Buckets are designed for long life in the harsh world of refuse applications. This high-capacity bucket is well-suited for loading, sorting and other transfer station work.

Woodchip and Clean-Up Buckets. Woodchip and Clean-up Buckets are available for forestry and millyard applications.

Multi-Purpose Buckets. Multi-Purpose Buckets have a unique four-way action that can load, strip topsoil, bulldoze, clamp pipe or large chunks of concrete, clean up debris, and many other tasks.

Side Dump Buckets. Side Dump Buckets dump both to the front and to the side of the machine, an advantage when working in tight quarters, such as street work, tunnel construction and building levees.



Forks. Logging, Millyard and Pallet Forks are available for forestry and material handling applications.

Loader Rakes. Loader Rakes are durable, high-capacity tools for land clearing and site clean up. Rakes are available with or without top clamps and in quick coupler and pin-on models.

Material Handling Arms. Material Handling Arms move pipe, concrete blocks, highway dividers and other construction materials quickly and precisely.

Ground Engaging Tools (GET). Several GET options are available from Caterpillar for 938H buckets. Reversible bolt on cutting edges (BOCE) as well as bolt on teeth and segments provide maximum performance in various materials.

OWNING AND OPERATING COSTS

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 idle control 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.



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.

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.

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.

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.



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.

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



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.



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.

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.



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.

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.

S-O-S SERVICES. 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.



REMOTE PRESSURE TAPS. Pressure taps for key systems are grouped and centrally located throughout the machine and help facilitate quick diagnostics.

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.

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.



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.

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.

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.



COMPLETE CUSTOMER SUPPORT.

Cat field service technicians have the experience and tools necessary to service your loader on site. Technical experts at the dealership and Caterpillar can provide additional assistance to field service technicians as needed.

When on-site repair isn't enough, Cat dealerships are fully equipped to service your loader quickly.

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.

Implement 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.



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.



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.

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 a 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.

SAFETY.CAT.COM™.

Engine

Engine Model	Cat® 6.6 ACERT™	
Gross Power – SAE J1995	147 kW	197 hp
Net Power – ISO 9249	134 kW	180 hp
Net Power – SAE J1349	128 kW	172 hp
Net Power – 80/1269/EEC	134 kW	180 hp
Peak Torque (Net) @ 1,400 rpm	840 N·m	620 ft·lb
Total Torque Rise	38 %	
Bore	105 mm	4.1 in
Stroke	127 mm	5 in
Displacement	6.6 L	402.8 in ³

- Caterpillar engine with ACERT™ Technology – EPA Tier III, EU Stage III Compliant.
- These ratings apply at 2,100 rpm when tested under the specified standard conditions.
- 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.

Weights

Operating Weight	15 059 kg	33,190 lb
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- For 2.8 m³ (3.65 yd³) general purpose bucket with standard 20.5-R25 tires.

Buckets

Bucket Capacities	2.3 - 3.0 m ³	3.0 - 4.0 yd ³
Max Bucket Capacity	3 m ³	4 yd ³

Operating Specifications

Static Tipping Load, Full Turn	10 076 kg	22,207 lb
Breakout Force	123 kN	27,576 lb

- For 2.8 m³ (3.65 yd³) general purpose bucket with standard 20.5-R25 tires.

Transmission

Forward 1	8.1 km/h	5 mph
Forward 2	14.6 km/h	9.1 mph
Forward 3	25.5 km/h	15.8 mph
Forward 4	43.2 km/h	26.8 mph
Reverse 1	8.1 km/h	5 mph
Reverse 2	14.6 km/h	9.1 mph
Reverse 3	25.5 km/h	15.8 mph

- Maximum travel speeds with empty bucket and 20.5-R25 tires.

Hydraulic System

Steering System Pump Type	Piston	
Hydraulic Cycle Time – Raise	5.4 Seconds	
Hydraulic Cycle Time – Dump	1.4 Seconds	
Hydraulic Cycle Time – Lower, Empty, Float Down	2.7 Seconds	
Hydraulic Cycle Time – Total	9.5 Seconds	
Pilot System – Pump Output	295 L/min	77.9 gal/min

- Implement System (Standard), Piston Pump – Rated at 2,100 rpm and 1,000 psi (6900 kPa).
- Cycle time with rated payload.

Brakes

Brakes	Meets required standards
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- Meet OSHA, SAE J1473 Oct90 and ISO 3450-1985 standards.

Axles

Front	Fixed front	
Rear	Oscillating ±12°	
Maximum Single-Wheel Rise and Fall	420 mm	17 in

Tires

Tires Choose from a variety of tires to match your application.

- Choice of:
 - 20.5R25 XTLA L2 Radial
 - 20.5R25 XHA L3 Radial
 - 20.5R25 GP2B L3 Radial
 - 20.5R25 HRL L3 Radial
 - 20.5R25 RL-2+ L3 Radial
 - 650/65R-25 XLD L3 Radial (Low Profile)
 - 20.5-25 SRG LD L3 Bias (16 PLY)
 - 20.5-25 SRG LD L3 Bias (20 PLY)
 - 20.5-25 RM 99 L3 Bias
- NOTE: In certain applications (such as load and carry) the loader's productive capabilities might exceed the tires' tonnes-km/h (ton-mph) 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.

Cab

ROPS/FOPS Meets SAE and ISO standards

- Caterpillar cab with Integrated Rollover Protective Structure (ROPS) is standard in North America and Europe.
- ROPS meets SAE J1040 APR88 and ISO 3471:1994 criteria.
- Falling Objects Protective Structure (FOPS) meets SAE J231 Jan81 and ISO 3449:1992 Level II criteria.
- The operator sound pressure level measured according to the procedures specified in ISO 6394:1998 is 75 dB(A) for the cab offered by Caterpillar when properly installed and maintained and tested with the doors and windows closed.
- Hearing protection may be needed when operating with an open operator station and cab (when not properly maintained or doors/windows open) for extended periods or in noisy environment.
- The sound power level is 108 dB(A) measured according to the dynamic test procedure and conditions specified in ISO 6395:1998 for a standard machine configuration.

Service Refill Capacities

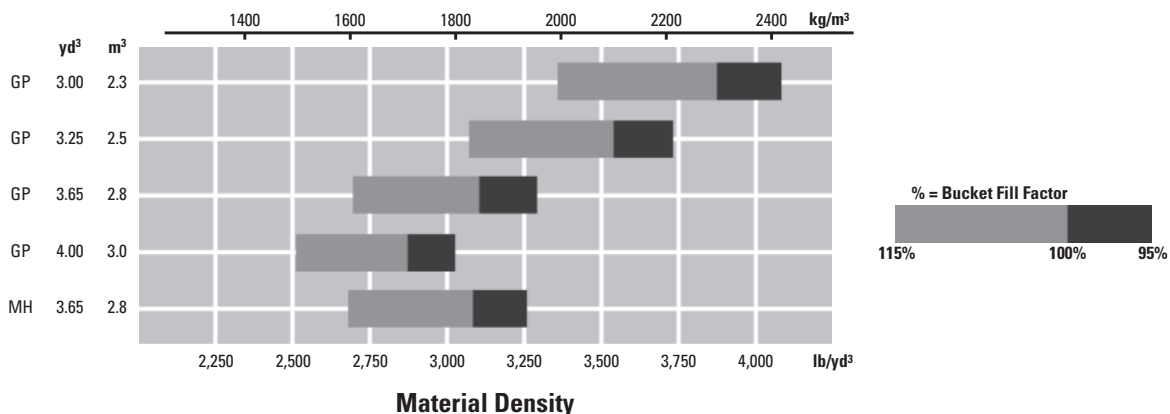
Fuel Tank – Standard	247 L	65.3 gal
Cooling System	36 L	9.5 gal
Crankcase	17.4 L	4.6 gal
Transmission	43 L	11.4 gal
Differentials and Final Drives – Front	57 L	15.1 gal
Differentials and Final Drives – Rear	53 L	14 gal
Hydraulic Tank	89 L	23.5 gal

Operation Specifications

General Purpose Buckets

		Teeth and segments			Teeth and segments		
		Bolt-on edges	Teeth	Teeth	Bolt-on edges	Teeth	Teeth
Rated capacity	m ³	2.30	2.30	2.10	2.50	2.50	2.30
	yd ³	3.00	3.00	2.75	3.25	3.25	3.00
Struck capacity	m ³	1.97	1.97	1.87	2.11	2.11	2.01
	yd ³	2.58	2.58	2.45	2.76	2.76	2.63
Width	mm	2700	2777	2777	2700	2777	2777
	ft/in	8'10"	9'1"	9'1"	8'10"	9'1"	9'1"
Dump clearance at full lift and 45° discharge	mm	2890	2786	2786	2849	2744	2744
	ft/in	9'5"	9'1"	9'1"	9'4"	9'0"	9'0"
Reach at full lift and 45° discharge	mm	993	1098	1098	1019	1123	1123
	ft/in	3'3"	3'7"	3'7"	3'4"	3'8"	3'8"
Reach with lift arms horizontal and bucket level	mm	2189	2336	2336	2239	2386	2386
	ft/in	7'2"	7'7"	7'7"	7'4"	7'9"	7'9"
Digging depth	mm	50	50	25	50	50	25
	in	1.9	1.9	0.9	1.9	1.9	0.9
Overall length	mm	7193	7351	7351	7243	7401	7401
	ft/in	23'7"	24'1"	24'1"	23'9"	24'3"	24'3"
Overall height with bucket at full raise	mm	5140	5140	5140	5188	5188	5188
	ft/in	16'10"	16'10"	16'10"	17'0"	17'0"	17'0"
Loader clearance circle with bucket in carry position	mm	11 946	12 105	12 105	11 971	12 131	12 131
	ft/in	39'2"	39'8"	39'8"	39'3"	39'9"	39'9"
Static tipping load, straight	kg	11 834	11 737	11 959	11 755	11 658	11 878
	lb	26,081	25,867	26,357	25,909	25,694	26,179
Static tipping load, articulated at full 40° turn	kg	10 302	10 205	10 415	10 229	10 131	10 339
	lb	22,706	22,492	22,954	22,544	22,329	22,787
Breakout force	kN	141.9	141.1	152.7	134.9	134.2	144.7
	lb	31,877	31,703	34,297	30,317	30,143	32,508
Operating weight	kg	14 952	15 027	14 932	14 986	15 061	14 966
	lb	32,955	33,120	32,911	33,028	33,194	32,984
Reach at 2134 mm (7'0") height, 45° dumped	mm	1508	1563	1563	1516	1567	1567
	ft/in	4'11"	5'1"	5'1"	4'11"	5'1"	5'1"
Clearance at full raise and dump, on stops	mm	2821	2706	2706	2786	2671	2671
	ft/in	9'3"	8'10"	8'10"	9'1"	8'9"	8'9"
Dump angle at full raise and dump, on stops	degrees	51.2	51.2	51.2	50.5	50.5	50.5

Pin-On Bucket Selection Guide



						Material Handling Buckets			General Purpose Buckets – Quick Coupler		
Bolt-on edges	Teeth and segments	Teeth	Bolt-on edges	Teeth and segments	Teeth	Bolt-on edges	Teeth and segments	Teeth	Bolt-on edges	Teeth and segments	Teeth
2.80 3.65	2.80 3.65	2.70 3.50	3.00 4.00	3.00 4.00	2.85 2.75	2.80 3.65	2.80 3.65	2.70 3.50	2.40 3.15	2.40 3.15	2.30 3.00
2.41 3.15	2.41 3.15	2.30 3.01	2.66 3.48	2.66 3.48	2.55 3.34	2.42 3.17	2.42 3.17	2.32 3.03	2.02 2.64	2.02 2.64	1.92 2.51
2700 8'10"	2777 9'1"	2777 9'1"	2700 8'10"	2777 9'1"	2777 9'1"	2700 8'10"	2777 9'1"	2777 9'1"	2700 8'10"	2777 9'1"	2777 9'1"
2771 9'1"	2664 8'8"	2664 8'8"	2702 8'10"	2597 8'6"	2597 8'6"	2720 8'11"	2607 8'6"	2607 8'6"	2774 9'1"	2669 8'9"	2669 8'9"
1077 3'6"	1179 3'10"	1179 3'10"	1102 3'7"	1206 3'11"	1206 3'11"	1001 3'3"	1096 3'7"	1096 3'7"	1017 3'4"	1120 3'8"	1120 3'8"
2339 7'8"	2486 8'1"	2486 8'1"	2397 7'10"	2544 8'4"	2544 8'4"	2339 7'8"	2486 8'1"	2486 8'1"	2285 7'5"	2432 7'11"	2432 7'11"
50 1.9	50 1.9	25 0.9	110 4.3	110 4.3	85 3.3	50 1.9	50 1.9	25 0.9	109 4.3	109 4.3	84 3.3
7343 24'1"	7501 24'7"	7501 24'7"	7450 24'5"	7608 24'11"	7608 24'11"	7343 24'1"	7502 24'7"	7502 24'7"	7337 24'0"	7496 24'7"	7496 24'7"
5284 17'4"	5284 17'4"	5284 17'4"	5195 17'0"	5195 17'0"	5195 17'0"	5272 17'3"	5272 17'3"	5272 17'3"	5075 16'7"	5075 16'7"	5075 16'7"
12 024 39'5"	12 185 39'11"	12 185 39'11"	12 106 39'8"	12 267 40'2"	12 267 40'2"	12 024 39'5"	12 185 39'11"	12 185 39'11"	12 009 39'4"	12 165 39'10"	12 165 39'10"
11 593 25,551	11 494 25,333	11 711 25,811	11 488 25,320	11 388 25,100	11 602 25,571	11 514 25,376	11 416 25,160	11 627 25,625	11 655 25,688	11 558 25,474	11 773 25,947
10 076 22,207	9977 21,989	10 182 22,441	10 000 22,041	9901 21,821	10 103 22,267	10 008 22,057	9909 21,841	10 109 22,281	10 122 22,310	10 025 22,095	10 228 22,543
122.7 27,576	122.0 27,402	130.8 29,395	117.2 26,320	116.3 26,133	124.5 27,959	122.7 27,576	122.0 27,402	130.8 29,394	129.4 29,063	128.5 28,875	138.2 31,060
15 059 33,190	15 134 33,355	15 039 33,146	14 898 32,835	14 973 33,000	14 878 32,791	15 048 33,165	15 123 33,331	15 028 33,121	15 165 33,424	15 240 33,589	15 145 33,379
1535 5'0"	1579 5'2"	1579 5'2"	1523 4'11"	1566 5'1"	1566 5'1"	1433 4'8"	1462 4'9"	1462 4'9"	1477 4'10"	1523 4'11"	1523 4'11"
2714 8'10"	2599 8'6"	2599 8'6"	2631 8'7"	2516 8'3"	2516 8'3"	2714 8'10"	2599 8'6"	2599 8'6"	2710 8'10"	2596 8'6"	2596 8'6"
49.5	49.5	49.5	50.5	50.5	50.5	45.5	45.5	45.5	50.6	50.6	50.6

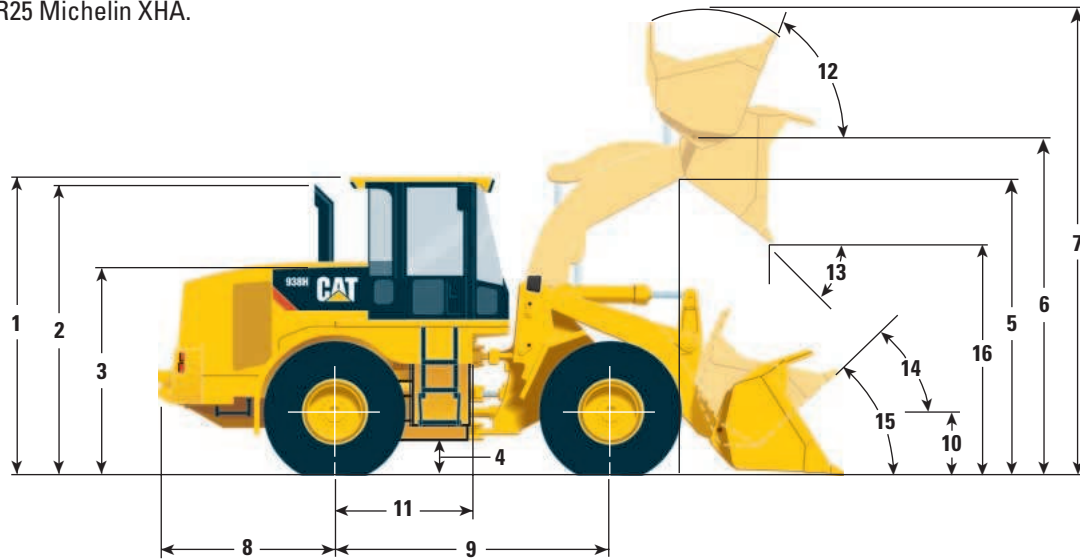
Operation Specifications

		General Purpose Buckets – Quick Coupler						Refuse Bucket
		Bolt-on edges	Teeth and segments	Teeth	Bolt-on edges	Teeth and segments	Teeth	Bolt-on edges
Rated capacity	m ³	2.70	2.70	2.60	2.80	2.80	2.70	4.25
	yd ³	3.50	3.50	3.40	3.65	3.65	3.50	5.50
Struck capacity	m ³	2.35	2.35	2.25	2.46	2.46	2.36	3.73
	yd ³	3.07	3.07	2.94	3.22	3.22	3.09	4.88
Width	mm	2700	2777	2777	2700	2777	2777	2738
	ft/in	8'10"	9'1"	9'1"	8'10"	9'1"	9'1"	8'11"
Dump clearance at full lift and 45° discharge	mm	2708	2603	2603	2681	2575	2575	2501
	ft/in	8'10"	8'6"	8'6"	8'9"	8'5"	8'5"	8'2"
Reach at full lift and 45° discharge	mm	1077	1180	1180	1106	1210	1210	1142
	ft/in	3'6"	3'10"	3'10"	3'7"	3'11"	3'11"	3'8"
Reach with lift arms horizontal and bucket level	mm	2374	2521	2521	2414	2561	2561	2594
	ft/in	7'9"	8'3"	8'3"	7'11"	8'4"	8'4"	8'6"
Digging depth	mm	122	122	97	124	124	99	106
	in	4.7	4.7	3.8	4.8	4.8	3.8	4.1
Overall length	mm	7436	7594	7594	7478	7636	7636	7643
	ft/in	24'4"	24'10"	24'10"	24'6"	25'0"	25'0"	25'0"
Overall height with bucket at full raise	mm	5149	5149	5149	5149	5149	5149	5541
	ft/in	16'10"	16'10"	16'10"	16'10"	16'10"	16'10"	18'2"
Loader clearance circle with bucket in carry position	mm	12 063	12 219	12 219	12 085	12 242	12 242	12 244
	ft/in	39'6"	40'1"	40'1"	39'7"	40'1"	40'1"	40'2"
Static tipping load, straight	kg	11 400	11 302	11 513	11 455	11 356	11 566	9910
	lb	25,126	24,909	25,375	25,246	25,028	25,493	21,841
Static tipping load, articulated at full 40° turn	kg	9879	9780	9980	9937	9838	10 038	8526
	lb	21,773	21,556	21,996	21,901	21,682	22,123	18,792
Breakout force	kN	118.9	118.0	126.4	115.2	114.4	122.3	95.8
	lb	26,702	26,512	28,394	25,891	25,700	27,478	21,512
Operating weight	kg	15 326	15 401	15 306	15 227	15 302	15 207	15 725
	lb	33,779	33,944	33,734	33,560	33,725	33,516	34,657
Reach at 2134 mm (7'0") height, 45° dumped	mm	1501	1544	1544	1516	1557	1557	1441
	ft/in	4'11"	5'0"	5'0"	4'11"	5'1"	5'1"	4'8"
Clearance at full raise and dump, on stops	mm	2640	2525	2525	2610	2495	2495	2493
	ft/in	8'7"	8'3"	8'3"	8'6"	8'2"	8'2"	8'2"
Dump angle at full raise and dump, on stops	degrees	50.5	50.5	50.5	50.5	50.5	50.5	45.5

Dimensions

All dimensions are approximate and may vary with work tool.

Tires are 20.5R25 Michelin XHA.



1	Height to top of ROPS	3356 mm	11'0"
2	Height to top of exhaust pipe	3099 mm	10'2"
3	Height to top of hood	2415 mm	7'11"
4	Ground clearance/Standard tire See Chart below for other tires	397 mm	1'3"
5	Lift arm clearance @ maximum lift	3435 mm	11'3"
6	Bucket pin height @ maximum lift	3843 mm	12'7"
	Bucket pin height, optional high lift	4266 mm	13'11"
7	Overall height – bucket raised	5284 mm	17'4"
8	Center line of rear axle to edge of counterweight	1869 mm	6'1"

9	Wheelbase	3020 mm	9'10"
10	Height to center line of axle	688 mm	2'3"
11	Center line of rear axle to hitch	1510 mm	4'11"
12	Rack back @ maximum lift	65°	
13	Dump angle @ maximum lift	50°	
14	Rack back @ carry	50°	
15	Rack back @ ground	42°	
16	Dump clearance @ maximum lift and 45° dump	2771 mm	9'1"

Tires

		Width over tires – maximum (loaded)		Change in vertical dimensions		Change in operating weight without ballast		Change in static tipping load – straight		Change in static tipping load – articulated	
		mm	inches	mm	inches	kg	lb	kg	lb	kg	lb
20.5-R25 XTLA L2	Radial	2603	102	-16	-1	-170	-376	-120	-264	-104	-230
20.5-R25 XHA L3	Radial	2674	105	0	0	0	0	0	0	0	0
20.5 R25 GP2B L3	Radial	2619	103	+6	0	-53	-116	-37	-81	-32	-71
20.5 R25 HRL L3	Radial	2618	103	+23	+1	-48	-107	-34	-75	-30	-65
20.5 R25 RL-2+ L3	Radial	2609	103	+12	0	+13	+28	+9	+20	+8	+17
650/65R-25 XLD L3	Radial (Low Profile)	2733	108	0	0	+519	+1145	+364	+803	+318	+701
20.5-25 SRG LD L3	Bias (16 PLY)	2558*	101*	+8	0	-242	-533	-170	-374	-148	-326
20.5-25 SRG LD L3	Bias (20 PLY)	2556*	101*	+11	0	-174	-384	-122	-270	-107	-235
20.5-25 RM 99 L3	Bias	2540*	100*	+8	0	-58	-129	-41	-90	-36	-79

*Without bulge.

Standard Equipment

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

ELECTRICAL

- Alarm, back-up, adjustable
- Alternator, 24V/65A
- Battery disconnect switch with removable key
- Lighting:
 - Turn signals with flashing hazard function
 - Two halogen headlights with high/low beam
 - Parking lights
 - LED brake and tail lights
 - Two front and rear halogen work lights, cab mounted
- Jumpstart receptacle

OPERATOR ENVIRONMENT

- Air Conditioning
- Bucket/Work tool lever lockout feature
- Cab, ROPS/FOPS, pressurized and sound suppressed
- Coat hook
- Controls, lift and tilt functions
- Radio ready including antenna, speakers, two 12V/5A power outlets, includes cigar lighter
- Electric horn, dual actuation (steering wheel, implement pod)
- Sun Visor, Front
- Cab heating with fresh air inlet and defrosting function
- Messenger System
 - Monitoring and logging of machine data
 - Clock
 - Operator keypad
 - Axle oil temperature
- Product Link Ready (optional in some regions)
- Operator display, Gauges:
 - Engine coolant temperature
 - Fuel level
 - Hydraulic oil temperature
 - Speedometer
 - Gear indicator
 - Tachometer
 - Transmission oil temperature
- Operator display, Warning Indicators:
 - Glow Plugs
 - Electrical, alternator output
 - Engine inlet manifold temperature
 - Engine oil pressure
 - Fuel pressure
 - Hydraulic oil temperature
 - Parking brake
 - Primary steering oil pressure
 - Service brake oil pressure
 - Transmission filter bypass
 - Axle oil temperature

- Dual interior rearview mirrors
- Dual exterior rearview mirrors
- Interior operator lighting
- Storage compartments
- Lunchbox compartments
- Beverage holder
- Seat, KAB, cloth, adjustable
- Seat belt, retractable, 51 mm (2") wide
- Adjustable steering column/wheel
- Forward/Neutral/Reverse switch by implement controls
- LH door with sliding window
- RH sliding window and emergency exit
- Windshield wipers, front and rear
- Interval function for front and rear wipers
- Windshield washers, front and rear

POWER TRAIN

- Brakes, full hydraulic enclosed wet-disc
- Brake wear indicators with Integrated Braking System (IBS)
- Front axle with locking differential
- Drive line, extreme service
- Engine, Cat C6.6 ACERT and ATAAC technology, electronically controlled.
- Fan, radiator, electronically controlled, hydraulically driven, temperature sensing, on demand.
- Filters, fuel, primary/secondary
- Fuel priming pump (Electric)
- Fuel/Water separator
- Monitoring System, Axle Oil Temp.
- Muffler, sound suppressed
- Radiator, unit core (6 fpi) with ATAAC
- Starting aid (Glow Plugs)
- Trans, neutralizer lockout in messenger
- Torque converter
- Transmission, countershaft, automatic power shift (4F/3R)
- Variable Shift Control (VSC), messenger

Standard Equipment (cont'd)

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

OTHER STANDARD EQUIPMENT

- Automatic bucket positioner
- Counterweight
- Couplings, Caterpillar O-ring face seal
- Fenders, Extension, Platform, Rear
- Guards, (bottom crankcase and fuel tank)
- Hitch, drawbar with pin
- Hood, non-metallic power tilting
- Hoses, Caterpillar XT
- Hydraulics, Load Sensing
- Kickout, lift, automatic
- Kickout, tilt, adjustable
- Linkage, Z-bar, cast 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

HYDRAULICS

- Load sensing implement system, pressure sensing
- Load sensing steering system
- Two function hydraulic valve (lift and tilt)
- Two lever operator implement controls

TIRES, RIMS, & WHEELS

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

ANTIFREEZE

Premixed 50% concentration of Extended Life Coolant with freeze protection to -34°C (-29°F).

Optional Equipment

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

Alternator, heavy-duty	High Lift, three-valve with hydraulic horizontal pin quick coupler
Antifreeze, -50° C (-58° F)	Hydraulics, three or four-valve
Autolube	Joystick control, two, three or four valve
Buckets and work tools	Ladder, cable
Bucket Ground Engaging Tools (GET) – see Cat dealer for details	Lights, auxiliary cab lights
Camera, rear view	Lights, high intensity discharge (HID)
Coolant, extended life	Lights, warning beacon
Cooler, axle oil	Machine Security System
Differential Lock, automatic front and rear	Mirrors, heated external
Drain, axle ecology	Open canopy
Ether Starting Aid	Precleaner , turbine
Fenders/Platforms, narrow	Precleaner , turbine/trash
Fenders, roading	Quick Coupler, hydraulic horizontal pin
Guards, axle seal	Quick Coupler ready lines
Guard, front window, wide mesh	Radio, AM/FM CD player
Guard, power train bolt-on	Ride Control
Guard, power train hinged	Seat, air suspension
Guard, hitch area	Seat, heated air suspension
Guard, front driveshaft	Seatbelt, 76 mm (3") wide
Guard, roading light, front and rear	Seatbelt, 76 mm (3") wide (KAB)
Guard, tilt cylinder	Steering, secondary
Guard, transmission oil fill	Sunscreen, rear
Heater, engine coolant, 120- or 240-volt	Toolbox
High Lift, three-valve	

938H Wheel Loader

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