

938G

Wheel Loader



Cat® 3126 DITA diesel engine

Rated flywheel power	119 kW/160 hp
Maximum flywheel power	125 kW/168 hp
Bucket capacities	2.2 to 3.0 m ³
Operating weight	14 500 kg

938G Wheel Loader

State-of-the-art design, comfort and superior quality allow you to maximize productivity.

Engine

Cat 3126 DITA diesel engine is built

- ✓ for performance (*increased horsepower ratings*), durability, excellent fuel economy, low sound levels and meets emission regulations. The 3126 has many heavy-duty features normally found on larger displacement engines.

- ✓ A standard temperature sensing on-demand fan slows fan speed when temperatures are low – increasing available power. pg. 4-5

Drive Train

Automatic power shift transmission helps provide on-the-go speed and direction changes, while heavy-duty axles with enclosed wet-disc brakes are designed to provide optimum performance in all kinds of applications and operating environments.

pg. 6

Operator's Station

Engineered using advanced virtual reality technology to provide the operator unparalleled viewing area and comfort. Ergonomically designed for total machine control in a comfortable, roomy environment. All control levers, switches and gauges are positioned to maximize productivity.

- ✓ A new optional joystick with integrated F/N/R (Forward/Neutral/Reverse) switch is available. pg. 8-9

Hydraulics

Powerful and efficient Caterpillar hydraulics help provide strength and versatility for various applications, giving the 938G exceptional lift capacity and load handling. pg. 7

Performance and comfort you can feel.

Caterpillar® design delivers excellent breakout force, fast load and cycle times, precise maneuvering and smoother shifts for optimal performance and comfort.

Reliability you can trust.

Proven components, field-tested durability, combined with easy maintenance, ensures reliability over the life of the machine.

✓ New features

- Increased horsepower ratings
- On-demand fan (standard)
- Heavy duty drive line (standard)
- Increased ground speeds
- Optional joystick with integrated F/N/R (Forward/Neutral/Reverse) switch



Environmental Machine

Quieter operation with both the low sound and the Blue Angel version, availability of Cat biodegradable hydraulic synthetic ester based oil, combined with easy serviceability, help you meet or exceed current worldwide regulations and protect the environment. **pg. 13**

Buckets and Ground Engaging Tools

Choose from two bucket families, General Excavation and Universal, combined with a large variety of Ground Engaging Tool options to allow precise application match.

pg. 10-11

Serviceability

Easily perform daily maintenance up to 250-hour service intervals with ground-level access to all major service points including sight gauges for level checks of engine coolant, hydraulic and transmission oil. Most of these daily service points are located behind a lockable hinged door. The tilting hood provides unmatched access to the engine compartment and cooling system for larger maintenance jobs. **pg. 14**

Work Tools and Quick Couplers

- ✓ Add versatility to your machine with a wide range of attachments and special buckets offered by Caterpillar.

pg. 12

Preventive Maintenance

- ✓ Thanks to the Diagnostic Indicator, the Electronic Technician and the Scheduled Oil Sampling analysis, you can anticipate potential problems and avoid unscheduled repairs.

pg. 15



3126 DITA Engine (7.2 liters, 6 cylinder)

The six-cylinder, direct injection, turbocharged and aftercooled (DITA) engine is built for power, reliability, low maintenance, excellent fuel economy and low emissions.



Powerful performance. The 3126 DITA engine delivers, at the rated speed of 2200 rpm, the flywheel power of 119 kW (160 hp), and meets all current worldwide emissions standards.

Four-stroke cycle design delivers long power strokes, efficient fuel combustion with low emissions, and excellent fuel economy.

Precise engineering and stringent testing help maintain a tradition of quality and offer built-in serviceability, profit-boosting performance, and heavy-duty durability and reliability.

Torque rise. The direct injected fuel system provides a controlled fuel delivery increase as the engine lugs back from rated speed. This results in increased horsepower above rated power. A combination of increased torque rise and maximum horsepower improves response, provides greater rimpull, more lift force and faster cycle times. The 125 kW (168 hp) maximum flywheel power occurs at 1700 rpm when power is needed during the working cycle.

Deep skirt engine block design ensures rigidity and reduces vibration.

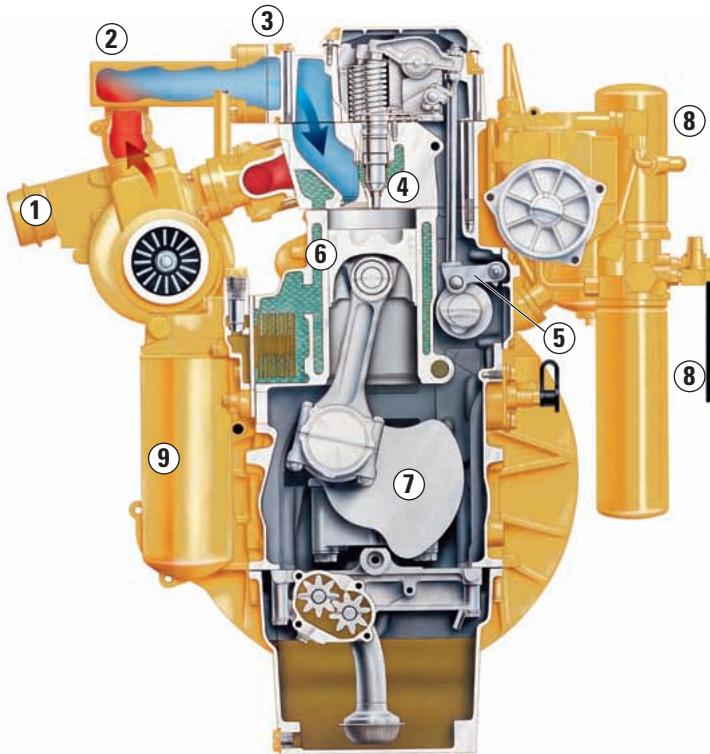
Caterpillar engine oil is formulated to optimize engine life and performance and is strongly recommended for use in Cat diesel engines.

Factory remanufactured parts. A large choice of factory remanufactured parts and dealer proposed repair options increase machine availability and reduce total repair costs.

Cooling system features an on-demand, hydraulically driven fan for less radiator plugging, lower noise levels and reduced fuel consumption (by 3% to 5% or more). This results from a lower average fan speed, which depends on the coolant temperature.

Individual, high-pressure unit injectors atomize fuel efficiently for fast response, increased fuel economy with low emissions. The radius cone injector nozzle features a larger contact area with the cylinder head sleeve ensuring excellent sealing with the combustion chamber.

Water Separator and fuel pre-filter element, combined with two High Efficiency, 2-micron fuel filters, in series, provide optimum filtration ensuring excellent fuel cleanliness and extended injector life. Electric fuel priming pump is standard.

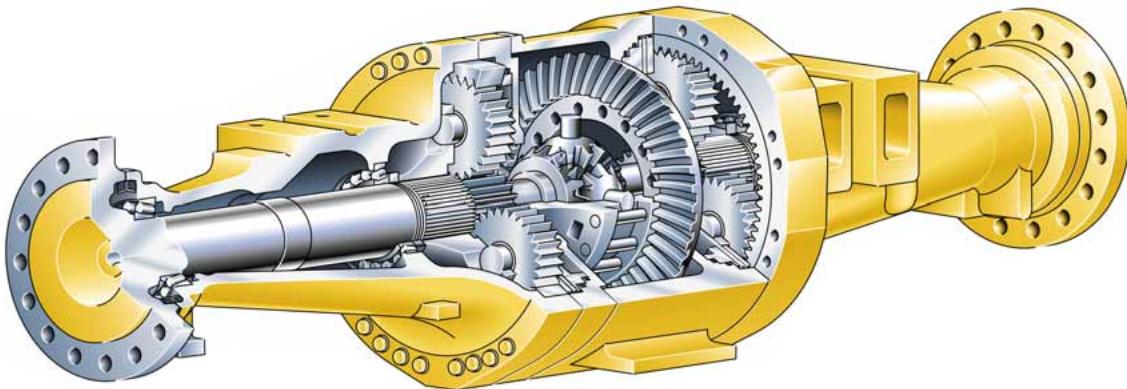


- 1 Turbocharger** enhances performance and engine efficiency, especially at high altitude by packing more air in the cylinders for excellent combustion.
- 2 Jacket Water Aftercooler** contributes to a cooler and more efficient combustion, reducing smoke and emissions as well as extending the life of piston rings and cylinder bore.
- 3 Air Intake Heater** (optional on some configurations) eases cold starts. When coolant temperature is above 10°C, the air intake heater does not operate. When below 10°C, the length of the heating period automatically adjusts to the temperature.

- 4 Radius cone injector nozzle.**
- 5 Camshaft roller followers** reduce wear and frictional power losses for better durability and fuel economy. Followers and pushrods can be replaced without removing the camshaft.
- 6 Two-piece, articulated pistons** with forged steel crown and forged aluminum skirt provide durability, lower engine sound levels and enhanced fuel efficiency with improved thermal and structural capability. The new Chrome Ceramic Surface (CCS) ring package, specifically developed for high load/high temperature applications, significantly improves engine block life.
- 7 Crankshaft** is forged and induction hardened for long-term durability. Seven main journals and eight counterweights are dynamically balanced for smooth operation. The crankshaft is regrindable. Connecting rods can be removed through the tops of the cylinders for servicing ease.
- 8 Series fuel filters** with ecological drain hoses and vent valve.
- 9 Large spin-on oil filter.**

Drive Train

The Cat drive train gets the job done smoothly and quickly



Heavy duty axles and brakes

are designed to last in all kinds of operating conditions. Planetary final drives use full-floating bronze sleeve bearings in the planet gears and differential pinion. Oil-disc brakes are adjustment free and fully enclosed to lock out contaminants. Patented Duo-Cone Seals between the axle shafts and housings keep lubrication in and dirt out. Oscillating rear axle helps ensure four-wheel ground contact for traction and stability, on uneven terrain.

The drive line has been upgraded to support the increased engine power settings.

Limited-slip and no SPIN differentials*

deliver maximum traction on uneven ground and in changing traction conditions such as mud, snow and ice

Power shift transmission with automatic shift capability is designed and built by Caterpillar. The electronically controlled power shift transmission allows full-power speed and directional changes. Fully modulated shifts increase component life and productivity, and help reduce operator fatigue.

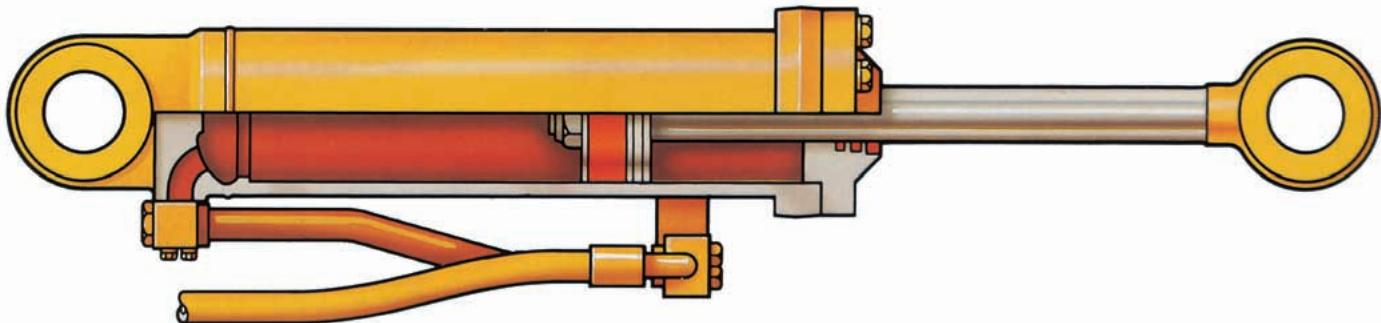
Easy maintenance is designed into the transmission. Built-in pressure taps help reduce troubleshooting time for increased machine availability.

Caterpillar Transmission Oil is balanced to provide optimum friction control for powershift transmissions and brake disc material and at the same time optimize transmission and final drive gear life.

* May be optional in some countries.

Hydraulics

Powerful hydraulics are the invisible force behind the loader's muscle and flexibility.



Matched hydraulics. Pump flow and large-bore lift and tilt cylinders ensure quick, efficient load handling.

Low-effort hydraulic control. A pilot control valve enables the operator to move the control lever with minimum effort. This reduces operator fatigue, while providing quick response and precise control. Lift height and digging angle can be preset, ensuring accuracy and cutting down on operator distractions.

Optional Caterpillar single hydraulic control (joy stick) combines lift and tilt functions and a new optional joystick adds a forward/neutral/reverse control switch.

Caterpillar Hydraulic Oil offers maximum protection against mechanical and corrosive wear in all hydraulic systems. Its high zinc content reduces wear and extends pump life.

Caterpillar XT hose and couplings are uniquely designed and tested to work together as a system for superior performance.

- Hoses are specifically engineered and manufactured for high abrasion resistance, excellent flexibility and easy installation. In today's hydraulic systems, that means long life, low unscheduled downtime and reduced operating costs.
- Caterpillar couplings use pre-installed O-ring face seals which provide positive sealing for reliable leak-free connections. Reliable components reduce the risk of leaks and blown lines, helping protect the environment.

Pressure taps allow quick diagnosis of the hydraulic system components.

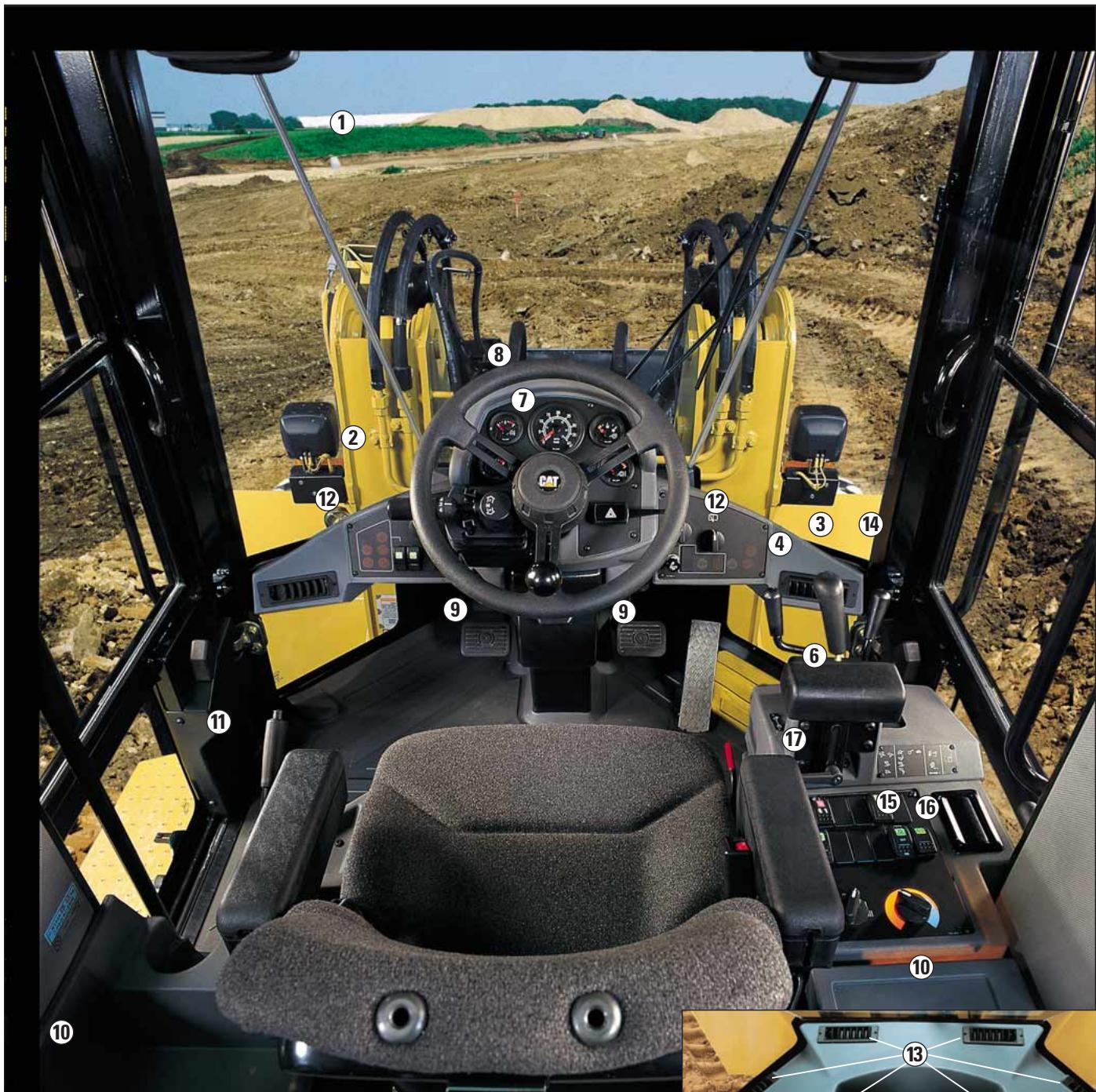
Smooth, efficient steering. Load sensing steering maximizes machine performance by directing power through the steering system only when needed. When the machine is not steering, more engine power is available to generate rimpull, breakout and lift forces. Load sensing reduces horsepower draw by up to 8%, resulting in increased fuel economy. Large-bore steering cylinders allow responsive maneuverability.

Automatic Ride Control* is an optional attachment that helps operators perform better. This system uses a nitrogen over oil piston-type accumulator in the hydraulic lift circuit that acts like a shock absorber for the bucket. The lift arms and bucket response to movement is dampened over rough ground, reducing fore and aft pitch. A smoother, more comfortable ride gives operators the confidence to travel at higher speeds during load and carry, improving cycle times and load retention.

* May be optional in some countries.

Operator Station

Comfort and control – top-quality operator's station will help maximize productivity.



The 938G cab is a spacious and comfortable work environment that promotes productive operation. The new cab includes larger windows, full sized mirrors, better ergonomics and generous storage areas.

Access/egress is through a new two-door design. Both doors open fully and lock flush against the side of the cab. Doors are available with either fixed or optional sliding glass windows.





1 Large windows ensure the viewing area in all directions. Twelve percent more glass area (compared to the former model) opens the operator's view for remarkable forward and peripheral viewing.

The stylish, sloping hood allows the operator a better view to the rear of the machine. View to the bucket corners is better, too. Silicone-bonded windshield and rear window eliminate pillar obstructions and improve serviceability.

2 Automatic shift control allows the operator to concentrate on the work, not gear selection. Preset factory shift points ensure each shift occurs at optimum torque. A switch allows the operator to select either automatic or manual shifting. The low-effort shift control allows one-handed shifting for speed or directional changes.

3 Quick gear kickdown button lets the operator downshift easily to a lower gear, saving time, increasing bucket fill factors and lowering cycle times.

4 Pilot-assisted hydraulic controls make low-effort operation possible.

5 A new optional joy stick adds a forward/neutral/reverse control switch on the single lever for easier operation and enhanced productivity.

6 Padded, adjustable wrist rest helps reduce fatigue.

7 Load-sensing, steering system with flow amplification matches steering response to application requirements.

8 Steering console and all the machine's primary gauges can be positioned infinitely within the tilt range by the operator. With the stroke of a lever, the entire console lifts effortlessly out of the way for easy access or egress.

9 Dual suspended brake pedals serve brake and transmission neutralizer functions so the operator can maintain high engine rpm for full hydraulic flow. Suspended pedals are the most ergonomic and simplify cleaning the cab floor.

10 Generous storage space includes:

- Lockable compartment for personal items.
- Coat hook.
- Molded compartments for lunchbox, cooler, thermos, cup or can.

11 Parking brake.

12 Warning indicators.

13 Improved ventilation for better air flow to the operator and windows. Six repositioned vents throughout the cab keep fresh air flowing while improving the cab's heating, cooling, defrosting and defogging capabilities. A large recirculation filter ensures better air quality and contributes to the operator comfort.

14 Optional third valve control, for controlling the hydraulic flow for powered attachments, is available.

15 Ride Control System switch allows the selection of three different modes:

- Off: permanently off service.
- On: permanently in service.
- Auto: in this mode, the system will automatically be actuated when the machine travels at a speed greater than 9 km/h and will be turned off below 9 km/h.

16 Electronic Autoshift control

17 Quick Coupler actuation circuit (optional). Use the dedicated quick coupler circuit to activate the quick coupler and change mechanical tools without leaving the cab.

Radio ready means this cab includes a 12-volt converter (5-amp), speakers, antenna, all wiring and brackets for entertainment or communications radio installation.

Payload Control System is an optional attachment, specifically designed for Cat wheel loaders. This system features improved on-the-go weighing as well as a broader weighing range, and is less sensitive to the various operator techniques. On-the-go weighing during the lift cycle helps the operator meet maximum loader productivity, while stationary weighing allows for reweighs and partial dumps, both modes achieving precise loading with a high level of accuracy.

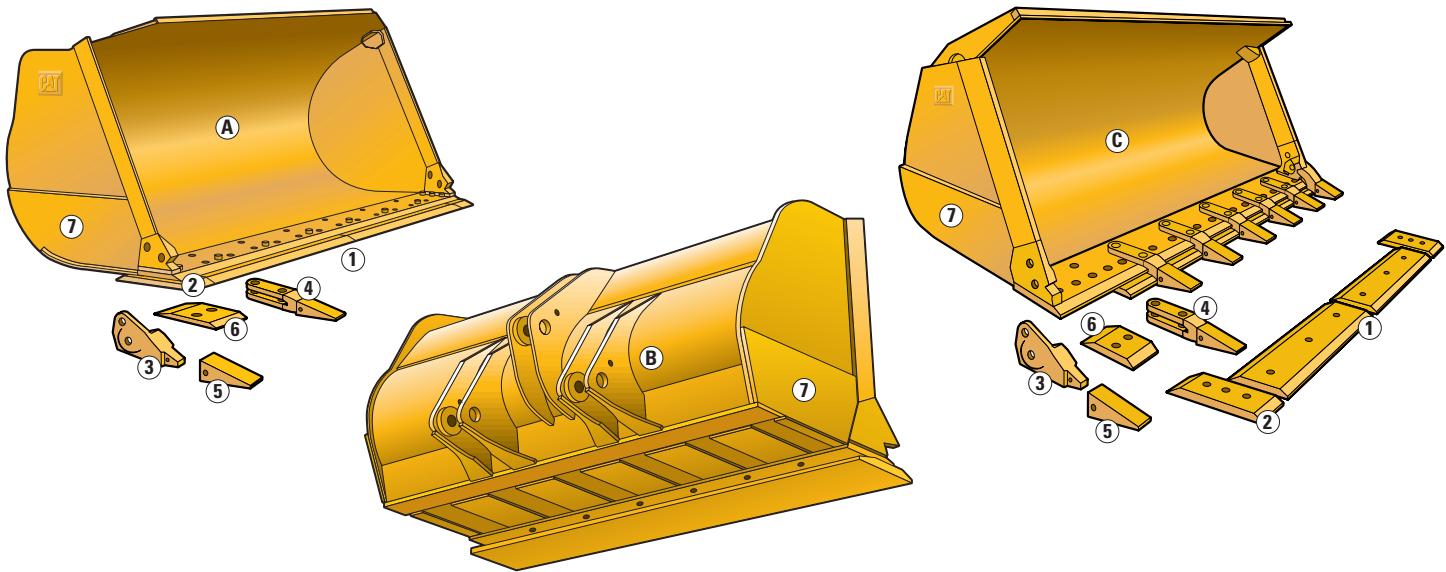
Seat options include the standard seat with adjustable fore/aft position, seatback angle, lumbar support, bottom cushion height, armrest angle and suspension stiffness. The seat cover is a combination of durable, breathable cloth and vinyl. Also available is the optional Cat Contour Series Seat, with added back support extension and electrically adjustable air suspension. Both seats are equipped with a wide and comfortable retractable seat belt.

Other 938G operator's station equipment:

- Cigar lighter and ashtray.
- Dome light.
- New external mirror package.
- Internal rearview mirrors.*
- Sun visor* for the front windshield.
- Air conditioning,* that uses R-134a refrigerant which does not contain chlorofluorocarbons.
- Optional roll-down sun screen for the rear window.
- Optional left and right pull down, latch windows.
- Standard lighting package including two forward halogen floodlights on the loader tower and four fixed-position halogen floodlights on the cab roof – two facing forward and two rearward.
- Optional auxiliary lighting package including a more powerful alternator (70 amp), two additional front-facing cab mounted halogen floodlights and two rear bumper mounted halogen floodlights that can be positioned by the user.

Cat Buckets and Ground Engaging Tools

Buckets and a large choice of Ground Engaging Tools maximize performance in all applications.



A Standard Universal buckets.

This is a new line of flat floor buckets featuring an optimized design. Equipped with various Ground Engaging Tools, they 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. In order to better meet the various application criteria, the Universal bucket line is available in different configurations:

B 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.

C General Excavation Buckets.

All General Purpose buckets have been renamed as General Excavation buckets to better reflect their application spectrum. Built to handle the toughest conditions, they 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. Replaceable through-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.

Corner guard system allows maximum flexibility between teeth and edge systems for superior protection and performance in each application.

- Bolt-on cutting edge (1) and end bits (2)**
- Standard DH-2, reversible, for superior strength and wear life.
 - Heavy-duty, reversible, providing 50% more wear life.
 - Abrasion Resistant Material (ARM) with impregnated tungsten carbide is another option for maximum wear life in low-to-medium impact application.

Bolt-on teeth

- New two-bolt corner adapter (3) securely attached to prevent shifting.
- Bolt-on two-strap center adapters (4).
- Seven tip options with Heavy-duty retention system. (5).

Bolt-on teeth and edge segments

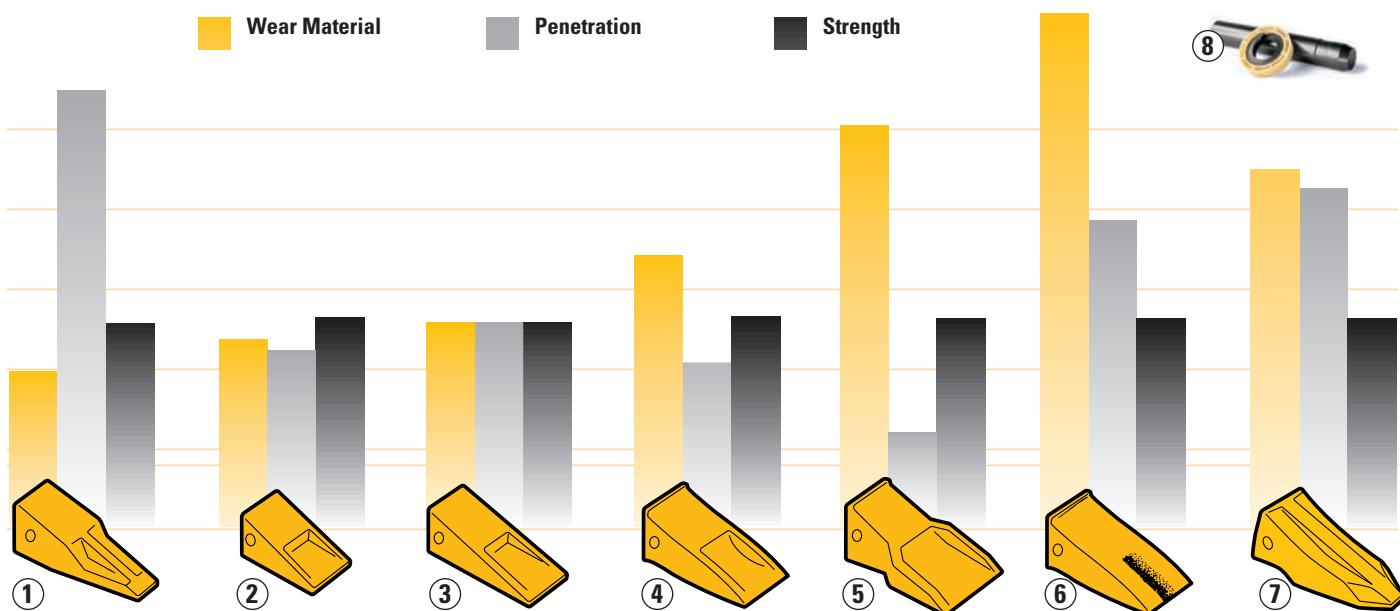
- Standard reversible segments (6) protect the base edge between teeth, eliminating scalloping and maintaining a smooth work surface.
- Heavy-duty reversible segments for 50% more wear life.

Replaceable side wear plates (7)

for greater durability.

Tip Selection and GET System Selection Guide

Seven tip options are available to provide the best combination of wear life, penetration and strength needed for each application.



1 Penetration

- Use in densely compacted material such as clay.
- Gives maximum penetration.
- Self-sharpening.

2 Short

- Use in high-impact and pry-out work such as rock.
- Extremely strong.

3 Long

- Use in most general applications where breakage is not a problem.

4 Heavy Duty Long

- Use in general loading and excavation work.
- Has extended wear life and greater strength

5 Heavy Duty Abrasion

- Use when working in sand, gravel and shot rock.
- Maximum wear material.

6 Heavy Duty Long Life

- A.R.M. positioned to increase wear life and penetration.
- As the Heavy Duty Long Life tip wears, ease of penetration increases.

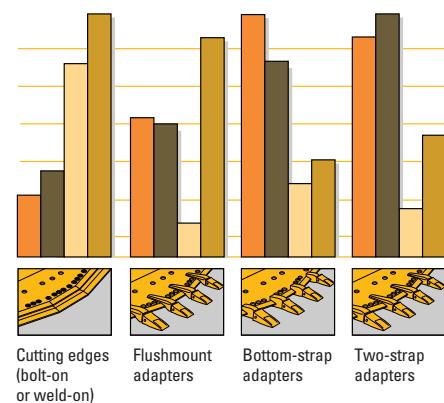
7 Heavy Duty Penetration

- Use in high-impact, hard-to-penetrate material.
- Extended wear life.

8 Heavy Duty retention system

eliminates pin walking and the resultant tip loss in particularly severe loading conditions.

GET system selection guide



Penetration ability

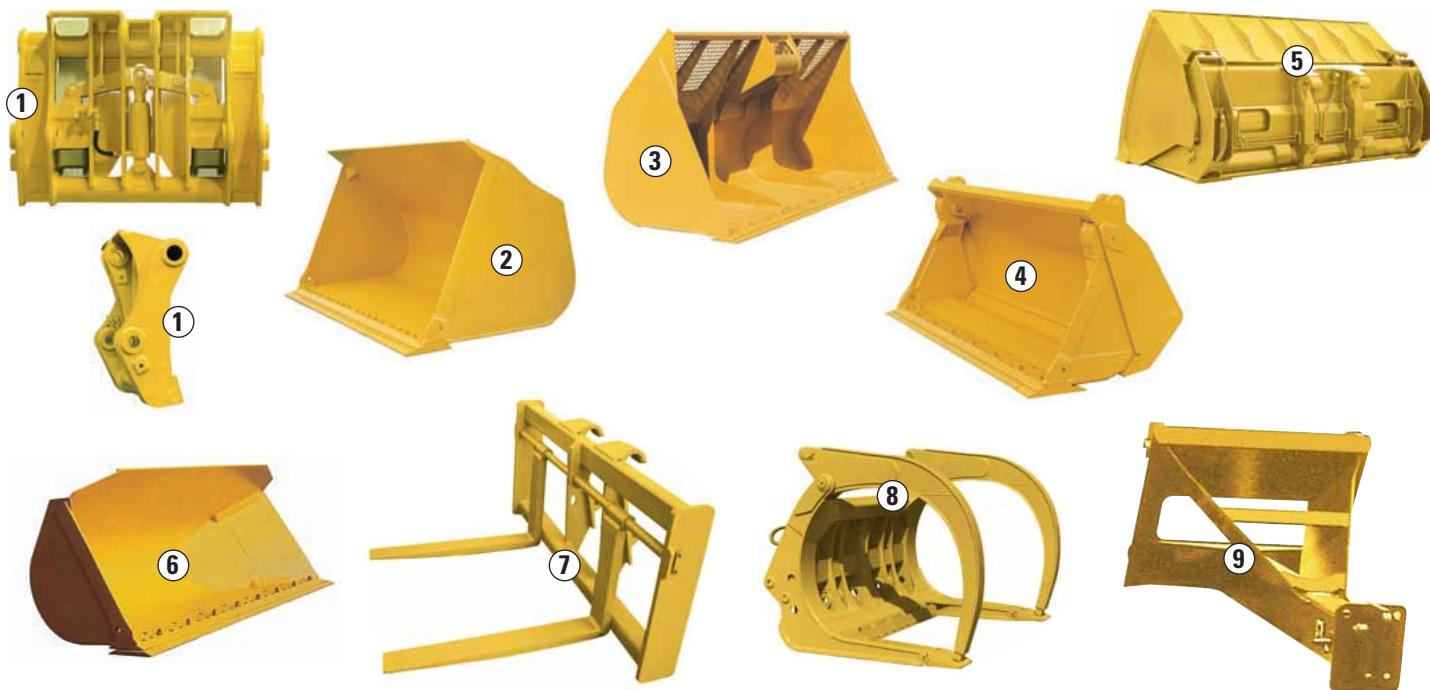
Impact resistance

Wear life/Abrasion protection

Smooth floor maintenance

Work Tools and Quick Couplers

Add versatility to your machine with a wide range of special buckets and quick couplers designed for the 938G to optimize your operation.



1 Quick couplers provide unmatched versatility and allows 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. The benefits of the vertical wedgelock quick coupler are:

- Minimal loss of break-out force
- Automatic adjustment for wear
- High durability

2 Coal buckets are available in special widths. All coal buckets include a bolt-on cutting edge.

3 Woodchip buckets are specially designed to load and carry woodchips and similar light materials. Bolt-on cutting edges are included as standard. Visibility screens help the operator with loading.

4 Multi-purpose buckets. Loading, dozing, clamping objects or filtering the discharge of material are easy tasks with multi-purpose buckets.

5 High-dump buckets are ideal for applications as various as loading stockpiled, light material into high sided trucks, hoppers in waste transfer stations or rehandling fertilizer, coal or grain.

6 Side-dump buckets permit loaders to operate in congested worksites and also dump forward like conventional buckets.

7 Forks. Pallet forks are the ideal tools for handling a variety of materials.

8 Log fork with top clamp – For tree length or cut to length logs. Lumber and log forks are also available.

9 Material handling arm with adjustable lengths and load capacities, material handling arm provide a boom for placing material from overhead – great for lowering pipes and beams into position on construction projects.

Fertilizer buckets are available and can be designed for different hopper heights, widths and intake capacities. The special design allows fertilizers to spread in the bucket filling in the whole volume.

Brick and clay buckets are ideal for the handling of sticky materials like clay and gypsum. They are fitted with specific linings, featuring low coefficient of friction and good abrasion resistance.

Screening buckets allow operators to scoop, screen, blend, mix and load materials as various as top soil, clay, sand peat, compost, bark, coal, lime, glass bottle... Different screening drums and tool options are available.

Plows. Hydraulic reversible plows angle 30°, left or right. This reversing action is ideal for cleaning applications on mountain roads, airports, parking lots, plant facilities, etc.

A complete range of attachments and tools is available from your Caterpillar dealer.

Environmental Machine

Caterpillar cares about the environment and continues to develop innovative solutions.



Building further on our product developments that were awarded the 'Blue Angel'* certificate for sound reduction by the German Federal Environmental Administration and pursuing Caterpillar's dedication to design products that are respectful of the environment, the 938G broadens our offerings and features two specific configurations.

The low sound version is two times quieter than the standard machine and is at 104 and 73 dB(A) for exterior and operator station respectively. To achieve these sound levels, following modifications are made:

- A noise wall isolating the engine from the cooling package.
- An on-demand fan (standard on all 938G), which automatically regulates the fan speed depending on the cooling requirements
- Reverse cooling system, which takes the fresh air from the back of the machine, through the cooling system and rejects through three perforated panels at the top and side of the machine
- Additional sound insulation around the engine

This design results in a quieter vehicle, reduced fuel consumption and an easier to clean radiator package.

* 'Blue Angel' certificate is from the 'RAL Deutsches Institut für Gütesicherung und Kennzeichnung e.V.'

The Blue Angel version further builds on the low sound platform in order to comply with the RAL German Institute for Quality Assurance and Certification's 'Blue Angel'* sound regulation and is rated at 101 and 72 dB(A) for exterior and operator sound levels respectively. This Blue Angel version is approximately two times quieter than the low sound version and four times quieter than the standard vehicle.

Environmental Fluids complete the offering with two specific products.

- Extended Life Coolant/Antifreeze with anti-foaming and anti-corrosion properties provides extended service intervals (up to 6000 hours) requiring less frequent fluid renewals and disposals. This is a standard feature.
- Cat Bio Hydo (HEES) is formulated from a fully saturated Hydraulic Environmental Ester Synthetic base stock and selected additives. It has excellent high-pressure and high-temperature characteristics. Provided a special water separator filter has been installed and depending on regular S•O•S analysis, Cat Bio Hydo (HEES) service intervals can be extended up to 6000 hours. It is fully compatible with our hydraulic components and allows operation over a broad temperature range. Cat Bio Hydo (HEES) is fully decomposed by soil or water microorganisms. This is available as an attachment.

Low exhaust emissions. The Cat 3126 DITA engine used in the 938G is a low emission engine designed to meet current emission regulations. Governor fuel-to-air ratio control, cylinder head and pistons, combined with a jacket water aftercooler, provide more efficient combustion, lower fuel consumption and cleaner emissions.

Fewer leaks and spills. Transmission and hydraulic oil filters, as well as engine oil and fuel filters are spin-on elements, positioned vertically and purposely located for a quick and easy access allowing their removal without fluid spillage. Lubricant fillers and drains are also designed to avoid spills.

Ecology drains for the engine, transmission, hydraulics, radiator and fuel are standard from factory. They replace the standard drain plugs. Activating the valve allows fluid to be drained into a container without spillage. Axle oil ecology drains are optional and allow quicker oil changes, eliminate spillage and reduce the time/risk of clean up.

Rebuildable components. Many of the major components used in the 938G are designed for rebuildability. That means you have high-quality, remanufactured (REMAN) parts available to you at a fraction of the new component cost.

Serviceability

Keep machines up and running with easy-to-perform daily maintenance.



Maintenance has never been more accessible than on G-Series machines. Fast, easy and reduced maintenance means improved uptime and greater value.

- Lockable, ground level service doors give quick access to engine oil fill and dipstick, coolant sight gauge, air filter indicator, rear grease fittings, and battery disconnect switch. Sight gauges for hydraulic and transmission oil levels are also easily viewable from the ground.
- 254 liter fuel tank provides extra capacity for long work days.
- Grouped remote grease fittings allow ground level access for lubricating tilt and steering cylinder pins and rear axle oscillation bearings.
- Caterpillar fluid filters are especially designed to assure maximum component life. The unique design uses non-metallic centertube and molded end-caps, which fully blend with media ensuring no internal leakage.
- Cat high efficiency fuel filters with STAY CLEAN VALVESTM feature cellulose/synthetic blend media that remove more than 98 percent of particles that are two microns or larger, maximizing fuel injector life.
- Caterpillar Radial Seal air filters do not require tools to service, reducing maintenance time. The ultra-high efficiency primary air filter element is coated with a fine layer of fibers that prevent dust particles from entering the filter media. This results in more efficient filtration, extended service intervals, and extended filter life – all contributing to reduced operating costs.

- Caterpillar Extended Life Coolant allows extended change intervals (6000 hours).
- Caterpillar maintenance-free, high output batteries are designed for high cranking power and maximum protection against vibration.
- Individual Multi-Row Modular core radiator reduces time to repair or replace the radiator.

Reliability and durability

- **Paint Process.** Great care is given to ensure a durable paint finish. Most brackets and other hardware are zinc-plated. Larger components are all prime painted, the cab receiving a zinc-phosphate based coating to prevent rust. The entire machine, as well as decals, is finish painted with a clear, two-component, polyurethane based paint which provides a durable, UV resistant, high gloss.
- **Electrical Systems** on Cat machines are designed and manufactured to resist the most severe conditions. Harnesses are made of large-section, colored and number-coded wires, the complete harness being protected by an abrasion resistant braiding. Connectors are made of rugged thermoplastic or cast-aluminum shells, sealed against moisture and contaminants. Harnesses are properly routed and securely clamped to ensure their reliability and durability.

Sloped hood, electrically or mechanically activated, tilts up for complete access to the engine, cooling system and other major components. If needed, the hood can be removed quickly and easily by removing three pins and disconnecting a single harness connector. A built-in lifting point facilitates easy lift off.

Automatic Greasing System supplies the required quantity of grease at the right interval to the grease points automatically, without manual interference. It greases whilst the machine is in operation, resulting in better distribution of grease over the bearing surface. Also, the automatic greasing reduces downtime, repair and overhaul costs, safety and environmental hazards and greasing costs (up to 75%). The automatic greasing system is optional and being factory installed prior to final assembly.

Caterpillar engine, transmission and hydraulic oils deliver maximum performance and service life.

Factory remanufactured parts.

A large choice of factory remanufactured parts and dealer proposed repair options increases machine availability and reduces repair cost.

Preventive Maintenance

By anticipating potential problems and avoiding unscheduled repairs, your equipment is always up and ready to run.



Diagnostic Indicator

The Diagnostic Indicator alerts the operator of immediate or impending problems with engine oil pressure, brake oil pressure, parking brake, electrical charging system, low fuel level, hydraulic oil level and primary and secondary (if equipped) steering.

- 1 ET software
- 2 Communications Adapter
- 3 Diagnostic Connector
- 4 Electronic Control Module (ECM)

Electronic Technician

Caterpillar Electronic Technician (ET) is a software program which allows the service technician to find and identify a problem on a machine and to analyze how to fix it quickly. ET provides him with the capability to access the Electronic Control Modules from a personal computer.

- The Electronic Technician is used for:
- Viewing active and non active diagnostic codes and clearing them after repair.
 - Displaying the status of all parameters such as engine speed, gear engaged, control levers position, control switch position, etc.
 - Performing diagnostic test and calibrations of electro-hydraulic components.
 - Viewing current configuration and changing parameter settings.
 - Flashing new Caterpillar softwares in the Electronic Control Modules.
 - Recording all parameters during machine operation.

A customer version of ET is also available for your fleet of Caterpillar equipment. Contact your Caterpillar dealer for more detailed information.

Scheduled Oil Sampling (S•O•S) analysis

Caterpillar has specially developed S•O•S. to help ensure better performance, longer life and increased customer satisfaction. It is an extremely thorough and reliable early warning system which detects traces of metals, dirt and other contaminants in your engine, axle, transmission and hydraulic oil. It can predict potential trouble early, thus avoiding costly unscheduled failures. Your Caterpillar dealer can give you results and specific recommendations shortly after receiving your sample.

Each S•O•S test can provide specific types of diagnostic:

- **Oil condition analysis** identifies loss of lubricating properties by quantifying combustion products such as soot, sulfur, oxidation and nitrates.
- **Wear analysis** monitors components wear by detecting, identifying and assessing the amount and type of metal wear elements found in the oil.
- **Chemical and physical test** detect the physical presence of unwanted fluids (water, fuel, antifreeze).

3126 DITA Engine

Four-stroke cycle, six-cylinder 3126 direct injected, turbocharged and aftercooled diesel engine.

Ratings	kW	hp
Maximum flywheel power at 1700 rpm	125	168

The following ratings apply at 2200 rpm when tested under the specified standard conditions:

Rated flywheel power	kW	hp
ISO 9249	119	160
EEC 80/1269	119	160

Maximum flywheel torque at 1200 rpm	844 Nm
Total torque rise	63%

Dimensions

Bore	110 mm
Stroke	127 mm
Displacement	7.2 liters

Exhaust emissions

The 3126 meets the following emissions requirements:

- EU (97/68/EC standard)
- US EPA
- Japan MOC

Power rating conditions

- net power advertised is the power available when the engine is equipped with hydraulic fan drive, alternator, air cleaner, and muffler
- no derating required up to 2300 m altitude

Features

- direct-injection fuel system with individual adjustment-free unit injectors for cylinders
- water jacket aftercooled
- aluminum-alloy skirt and steel crown, 3-ring, 2-piece articulated pistons, cam-ground, tapered and cooled by oil spray
- Chrome Ceramic Surface (CCS) top ring, designed for high load/high temperature application
- induction-hardened, forged crankshaft
- uniflow cylinder head design with two alloy-steel valves per cylinder
- deep-skirted cast cylinder block
- tapered connecting rods
- oscillating roller-followers
- direct-electric 24-volt starting and charging system with two 12-volt, CCA: 750BCI, 475 DIN Caterpillar maintenance-free batteries, heavy-duty starter and a 70-amp multi-row radiator
- air intake heater available
- Electric Fuel Priming pump

Transmission

Automatic power shift transmission with four speeds forward and three reverse.

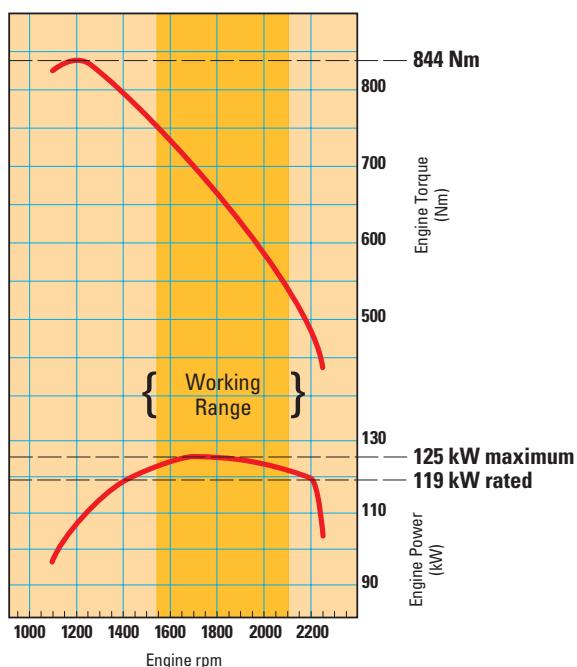
Maximum travel speeds (standard 20.5-25 tires)

Forward	km/h
1	7.4
2	13.4
3	23.4
4	39.4

Reverse	km/h
1	7.4
2	13.4
3	23.4

Features

- single lever to control both speed and direction
- separate control to lock in neutral
- single-stage, single-phase torque converter
- automatic shift
- quick gear kickdown button
- F-37 high energy friction material provides long clutch life
- externally mounted control valves with quick disconnects for easy diagnostic checks
- high contact ratio gears are precision ground for quiet operation



High Torque Rise

The direct injected fuel system delivers a controlled increase of fuel as the engine lugs back from rated speed. This results in horsepower greater than rated power. The combination of increased torque rise and maximum horsepower improves response, provides greater rimpull, more lift force and faster cycle times. The 125 kW (168 hp) maximum power occurs at 1700 rpm when power is needed during the working cycle.

Axles

Fixed front, oscillating rear ($\pm 15^\circ$)*.

Features

- maximum single-wheel rise and fall: 420 mm
- threaded nuts to set bearing pre-load
- patented Duo-Cone Seals between axle shaft and housing
- uses SAE 30W (oil change interval: 2000 hours or one year)
- conventional differential
- No SPIN differentials available
- Limited Slip Differentials available
- Traction Control System available

* Oscillating may have to be reduced when using L5 tires, chains or oversized tires.

Brakes

Meet the following standard:
ISO 3450-1996.

Service brake features

- full-hydraulic actuated, oil-disc brakes
- completely enclosed and sealed
- adjustment-free
- separate circuits for front and rear axles
- dual pedal braking system with transmission neutralizer

Parking brake features

- mechanical, shoe-type brake
- mounted on transmission output
- pull-cable operated
- application of parking brake neutralizes the transmission

Final Drives

Planetary final drives consist of ring gears and planetary carrier assemblies.

Features

- ring gears are pressed and doweled to axle housings
- carrier assemblies include:
 - planet gears with full-floating bronze sleeve bearings
 - planet shafts
 - retaining pins
 - bearings
 - sun gear shafts
 - planetary carriers

Hydraulic System

Implement system, vane-type pump

Output at 2597 rpm and 6900 kPa with SAE 10W oil at 66°C	163 liters/min
Relief valve setting	24 800 kPa
Cylinders, double acting:	
lift, bore and stroke	127 x 693 mm
tilt, bore and stroke	139.7 x 527 mm

Pilot system, variable displacement piston-type pump*

Output at 2597 rpm and 6900 kPa with SAE 10W oil at 66°C	102 liters/min
Working pressure	3000 kPa
Hydraulic cycle time	seconds
Raise	6.0
Dump	1.4
Lower, empty, float down	2.8
Total	10.2

* Common with steering pump.

Features

- completely enclosed system
- low effort, pilot-operated controls
- full-flow filtering
- reusable couplings with O-ring face seals
- lift height and digging angle presetting possibility
- pilot shutoff valves disables implement functions for added safety
- standard hydraulic oil cooler tilts out for easy cleaning of heat exchanger
- Caterpillar XT hoses
- pressure taps
- automatic Ride Control System available
- Cat biodegradable oil available

Cab

Caterpillar cab and Rollover Protective Structure (ROPS) are standard.

Features

- ROPS meets the following criteria:
 - ISO 3471:1994
- also meets the following criteria for Falling Objects Protective Structure:
 - ISO 3449:1992 LEVEL II
- corrosion-free roof cap

Implement Controls

Pilot-operated lift and tilt circuits.

Lift circuit features

- four positions: raise, hold, lower and float
- adjustable automatic kickout from horizontal to full lift

Tilt circuit features

- three positions: tilt back, hold and dump
- adjustable automatic bucket positioner to desired loading angle
- doesn't require visual spotting

Controls

- two lever control (standard)
- three lever control (optional)
- joy stick (optional) combines lift and tilt controls
- new (optional) joystick with an integrated F/N/R switch
- controls can be locked for roading and servicing

Load Sensing Steering

Full hydraulic power steering.

Meets ISO 5010:1992

Ratings

Minimum turning radius (over tire)	5480 mm
Steering angle, each direction	40°
Hydraulic output at 2597 rpm and 6900 kPa	102 liters/min
Relief valve setting	22 800 kPa

Features

- center-point frame articulation
- load sensing hydraulic steering pump
- front and rear wheels track
- flow-amplified, closed-center, pressure-compensated system
- steering-wheel operated metering pump controls flow to steering cylinders
- full-flow filtering
- adjustable steering column
- secondary steering available

Service Refill Capacities

	Liters
Fuel tank	254
Cooling system	52.5
Crankcase	20
Transmission	30
Differentials and final drives	
front	24
rear	27
Hydraulic system (including tank)	90
Hydraulic tank	55

Sound Levels/Dynamics

Operator sound	dB(A)
Standard sound suppression ⁽¹⁾	75
Low sound ⁽²⁾	73
Blue Angel ⁽³⁾	72
Exterior sound	
Standard sound suppression ⁽¹⁾	107
Low sound ⁽²⁾	104
Blue Angel ⁽³⁾	101

⁽¹⁾ The operator sound pressure levels are measured according to the dynamic test procedures and conditions specified in ISO6396. The exterior sound power levels are measured according to the dynamic test procedures and conditions specified in ISO 6395 and 95/27/EC.

⁽²⁾ According to EU 2000/C 83/01 requirements.

⁽³⁾ According to RAL-UZ 53:1998

Tires

Tubeless, loader-design tires.

- 20.5-R25 GP2B (L-3)
- 20.5-R25 RL5K (L-5)*
- 20.5-R25 RL2 (L-2)
- 20.5-R25 XTLA (L-2)
- 20.5-R25 XHA (L-3)
- 20.5-R25 XLDD (L-5)*
- 20.5-R25 X MINE (L-5)*
- 555/70-R25 XLD (L-3T)
- 625/70-R25 XLD70 (L-3T)*

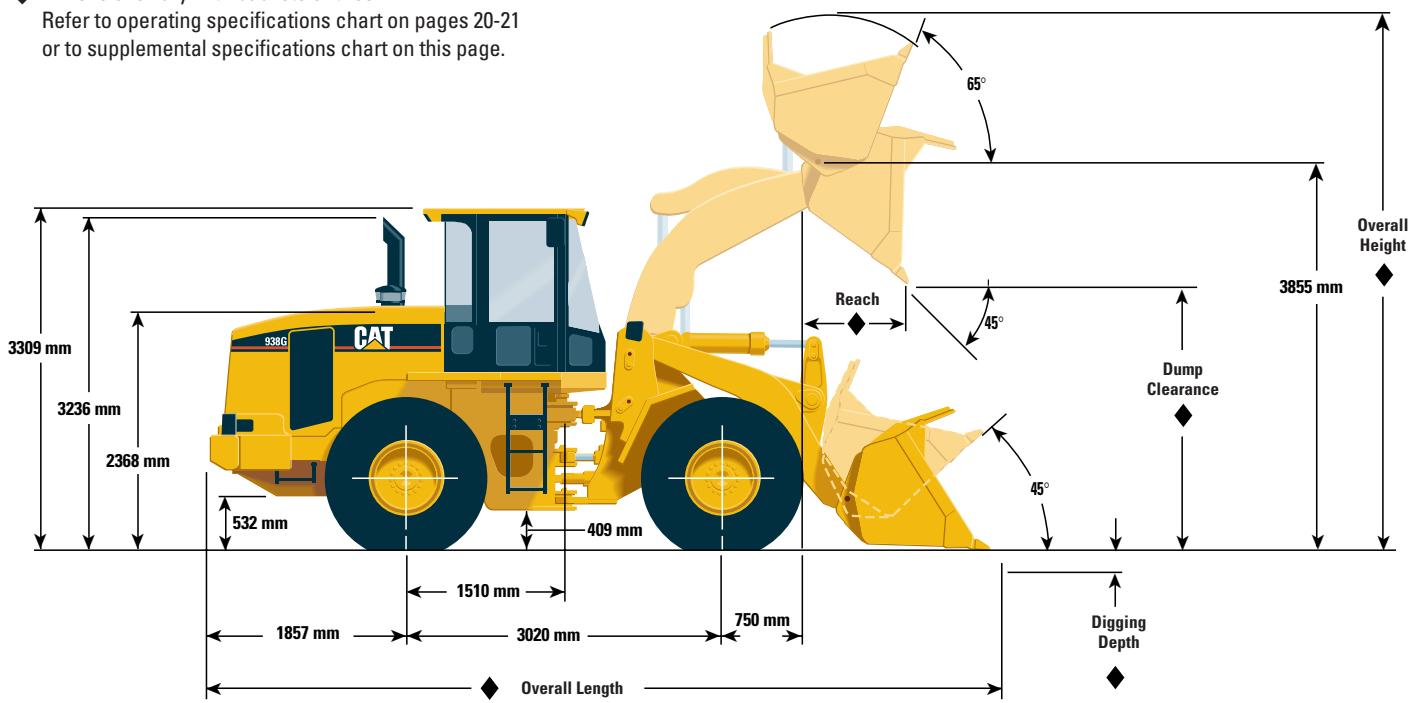
In certain applications (such as load-and-carry work) the loader's productive capabilities might exceed the tires' tonnes-km/h capabilities. Caterpillar recommends that you consult a tire supplier to evaluate all conditions before selecting a tire model.

* Axle oscillation limited to 10°.

Dimensions

All dimensions are approximate

- ◆ Dimensions vary with buckets or tires.
- Refer to operating specifications chart on pages 20-21 or to supplemental specifications chart on this page.



Note: Dimensions listed are for machines equipped with 20.5 R 25 XHA (L-3) tires.

Tread width for all tires is 2020 mm.

Supplemental Specifications

	XHA L3	XLD70 L3T	XLD70 L3T	XLDD2 L5	XMINED2 L5
Dimension	20.5 x R25	555/70 R25	625/70 R25	20.5 x R25	20.5 x R25
Width over tires (mm)	2550	2572	2636	2557	2570
Ground clearance (mm)	420	370	401	449	463
Change in all vertical dimensions (mm)	Used as reference	-50	-19	+29	+43
Tire weight	223	172	276	336	397
Weight variation (kg)	Used as reference	-204	+212	+452	+696
Change in static tipping load (kg)					
straight	Used as reference	-151	+170	+335	+515
full articulation	Used as reference	-128	+144	+285	+438
	XTLA L2	GP 2B L2/L3	RL 2+ L3T	GP 4B L4	RL 5K L5
Tread type	L2	L2/L3	L3T	L4	L5
Dimension	20.5 x R25	20.5 x R25	20.5 x R25	20.5 x R25	20.5 x R25
Width over tires (mm)	2555	2555	2564	2553	2577
Ground clearance (mm)	411	426	421	437	466
Change in all vertical dimensions (mm)	-9	+6	+1	+17	+46
Tire weight	187	221	247	271	373
Weight variation (kg)	-144	-8	+96	+192	+600
Change in static tipping load (kg)					
straight	-107	-6	+71	+142	+444
full articulation	-91	-5	+60	+121	+377

Operation Specifications

		Universal Buckets					
		Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments (no GET)	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments (no GET)	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments (no GET)
Rated bucket capacity	m ³	2.3	2.3 (2.3)	2.5	2.5 (2.5)	2.8	2.8 (2.8)
Struck capacity	m ³	1.9	1.9 (1.8)	2.1	2.1 (2.0)	2.4	2.4 (2.3)
Width	mm	2706	2777 (2689)	2706	2777 (2689)	2706	2777 (2689)
Dump clearance at full lift and 45° discharge ⁵	mm	2827	2723 (2896)	2791	2685 (2860)	2721	2607 (2789)
Reach at full lift and 45° discharge ⁵	mm	948	1052 (916)	984	1090 (950)	1054	1149 (1021)
Reach with lift arms horizontal and bucket level ⁵	mm	2242	2389 (2169)	2291	2442 (2220)	2391	2539 (2320)
Digging depth	mm	50	64 (25)	50	64 (25)	50	64 (25)
Overall length ⁵	mm	7181	7328 (7087)	7231	7371 (7137)	7331	7478 (7237)
Overall height with bucket at full raise	mm	5059	5059	5108	5108	5191	5191
B-Pin height	mm	3842	3843	3843	3843	3843	3843
Loader turning radius with bucket in carry position	mm	5955	6032 (5921)	5968	6046 (5934)	5996	6075 (5961)
Bucket weight	kg	1231	1372 (1097)	1279	1420 (1145)	1325	1466 (1191)
Static tipping load straight ¹	kg	11500	11370 (11810)	11420	11290 (11730)	11250	11120 (11570)
Static tipping load at 37° articulation ¹	kg	9990	9860 (10290)	9910	9780 (10210)	9750	9620 (10060)
Breakout force ²	kN	126	125.1 (137.2)	120	119.1 (130.2)	109.5	108.7 (118.2)
Operating weight ¹	kg	14181	14322 (14047)	14229	14370 (14095)	14275	14416 (14141)

¹ Static tipping load and operating weight shown are based on standard machine configuration with sound-suppression cab and ROPS, secondary steering, air conditioning, ride control, 20.5-R25, L-3, tires, full fuel tank, coolant, lubricants, lights, directional signals with CE plates and operator.

² For buckets with adapters, tips and segments, value is measured 102 mm behind the tip of the segment, with bucket hinge pin as pivot point, in accordance with SAE J732C.

³ 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.

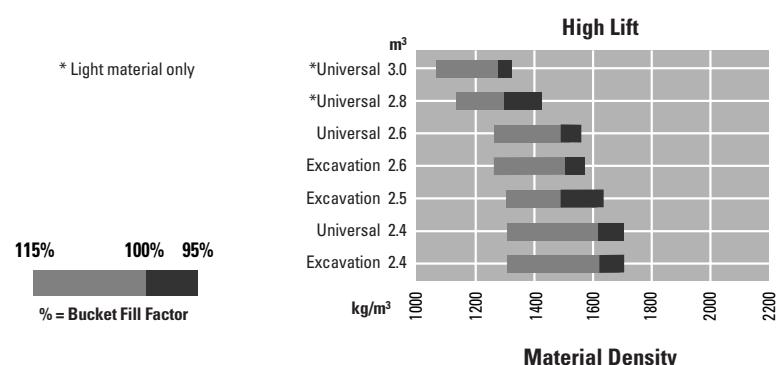
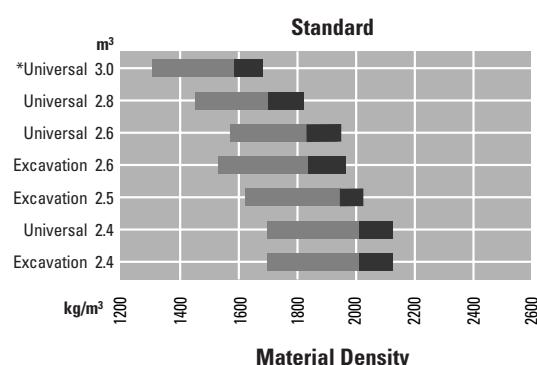
Dimensions for dump clearance, reach and overall length:

⁴ Measured at bucket base edge, not considering any Ground Engaging Tool.

⁵ 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.

General Excavation Buckets						High Lift ³
Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments (no GET)	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments (no GET)	Bolt-on Cutting Edge	Bolt-on adapters, Tips and Segments (no GET)	
2.3	2.3 (2.3)	2.5	2.5 (2.5)	2.8	2.8 (2.8)	same
1.9	1.9 (1.8)	2.1	2.1 (2.0)	2.4	2.4 (2.0)	same
2706	2777 (2689)	2706	2777 (2689)	2706	2777 (2689)	same
2827	2723 (2896)	2791	2685 (2860)	2721	2607 (2789)	+423
948	1052 (916)	984	1089 (950)	1054	1148 (1021)	+121
2242	2389 (2169)	2291	2442 (2220)	2392	2539 (2320)	+390
50	64 (25)	50	64 (25)	50	64 (25)	+58
7180	7328	7231	7371	7331	7478	+494
5059	5059	5108	5108	5191	5191	+423
3843	3843	3843	3843	3843	3843	+423
5955	6032 (5921)	5968	6046 (5934)	5996	6075 (5961)	+233
1249	1387 (1112)	1252	1393 (1126)	1369	1507 (1232)	same
11550	11420 (11880)	11480	11350 (11810)	11340	11210 (11660)	-1980
10020	9900 (10340)	9960	9830 (10270)	9820	9700 (10140)	-1780
125.9	124.9 (137.1)	119.9	118.7 (130.1)	109.4	108.6 (118.1)	-6.2
14199	14337 (14062)	14208	14349 (14082)	14319	14457 (14182)	+346

Bucket Selection Guide



Standard Equipment

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

Electrical

Alternator (50 amp)
Batteries (two 12-volt, maintenance free, CCA: 750BCI, 475 DIN)
Ignition key start/stop switch
Lights directional signals**
Main disconnect Switch
Starter, electric, heavy duty (24-volt)
Voltage converter (12-volt, 5 amp)
Working halogen lighting system including two forward floodlights on the loader tower and four fixed-position floodlights on the cab roof

Starting Aid

Air intake heater**

Operator Environment

Air conditioning (R 134a refrigerant)**
Air recirculation filter
Adjustable steering column
Cab, pressurized with sound suppression and rollover protective structure (ROPS)*
Cigar lighter and ashtray
Cloth seat (KAB) with adjustable backrest, armrest, and lumbar support
Storage:
Coat hook*
Cup and thermos holders
Lockable compartment for personal items
Dome light*
Heater and defroster*
Horn, electric (steering wheel mounted)
Implement lever lockout
Instrumentation:
Engine coolant temperature gauge
Fuel level gauge
Hourmeter
Hydraulic oil temperature gauge
Speedometer**
Torque converter oil temperature gauge
New mirrors, outside mounted
Radio ready cab*

Seat belt, retractable, 76 mm wide

Sun visor (front windshield)*/**

Tinted glass

Warning indicators:

Alternator
Coolant temperature
Engine oil pressure
Hydraulic oil temperature
Parking brake
Primary steering pressure*
Secondary steering pressure*
Service brake oil pressure
Transmission oil temperature
Windshield washers/wipers, wet-arm (front and rear), front intermittent*

Engine

Air-Precleaner, Radial Seal filters, primary (Ultra High Efficiency) and secondary
Cat 3126 diesel engine, direct injection, turbocharged with waste-gate valve and water jacket aftercooler
Cooling system:
Multi-row modular radiator
Radiator cooling on-demand fan, hydraulically driven
Hydraulic oil cooler
Air conditioner condenser*/**
Fuel filters, series
Fuel priming pump, electric
Fuel/water separator
Turbocharger

Drive Train

Brakes, full hydraulic actuated, enclosed wet disc
Control and quick gear kickdown button
Differential Limited Slip (rear)**
Muffler
Torque converter
Transmission, automatic powershift (4F/3R) with fully automatic speed range
Transmission neutralizer on/off switch

Hydraulics

Automatic bucket positioner
Automatic lift kickout
Automatic Ride Control System**
Caterpillar O-ring face seals couplings
Caterpillar XT hoses
Loader linkage, sealed Z-bar design
Pilot hydraulic controls
Secondary steering**
Steering, load-sensing hydraulic

Preventive Maintenance

Caterpillar Diesel Engine Oil
Caterpillar Hydraulic Oil
Caterpillar Transmission Oil
Caterpillar High Efficiency Fuel Filters
Caterpillar Ultra High Efficiency Air Filter
Caterpillar Liquid Filters
Extended Life Coolant antifreeze (-30°C)
Hydraulic pressure taps (diagnostic connectors)
Service Indicators:
Air cleaner
Coolant level sight gauge
Hydraulic oil level sight gauge
Transmission oil level sight gauge
Scheduled Oil Sampling (S•O•S) valves

Other Standard Equipment

Bottom guard**
Counterweight
Drawbar hitch with pin
Fenders, front (steel) and rear
Front fender mud flaps
Power train guard**
Tilting hood, non-metallic, one-piece
Vandalism protection caplocks**
* Not included in open cab configuration
**May be optional in some countries

Optional Equipment

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

Electrical

Alternator (70 amp)
Auxiliary halogen lighting package
including alternator (70 amp),
two cab-mounted floodlights and
two rear bumper mounted floodlights
Back up alarm
Roading light package, including
turning signals and high/low beams
Warning lighting system
(rotating beacon)

Starting Aid

Batteries (two 12-volt, maintenance free,
CCA: 900BCI, 525 DIN)
Engine coolant heaters (120 or 240 volt)
Ether starting aid (-26°C)

Operator Environment

Cat Contour Seat (electrical air
suspension)
Left and right pull down, latch
windows*
Rearview mirrors, interior
Roll-down sun screen (rear window)*

Drive Train

Axle seal guards
Differential Limited Slip (front)
Differential No SPIN (front)
Differential No SPIN (rear)

Hydraulic

Hydraulic arrangement: third valve
Hydraulic arrangement: joystick
(single lever)
Hydraulic arrangement: joystick with
F/N/R switch
Hydraulic oil cooling package,
high ambient
Quick coupler actuation circuit

Preventive Maintenance

Automatic central lubrication system
Cat Turbine PreCleaner
Cat Turbine PreCleaner (trash version)
Extended Life Coolant antifreeze
(-35 to -50°C)

Environmental Attachments

Sound levels:
Low sound version*, at 104 dB(A)
exterior and 73 dB(A) operator
Blue Angel version*, at 101 dB(A)
exterior and 72 dB(A) operator
Cat Bio Hydo (HEES), biodegradable
hydraulic synthetic ester based oil

* Not included in open cab configuration

Other Optional Attachments

Attachments (see pg. 12)
Buckets (see pg. 10-11)
High Lift arrangement
High Lift arrangement third valve
Open cab, including ROPS
Payload Control System
Platform extension fenders
Rear full coverage roading fenders,
swingable, non-metallic

Field Installed Attachments

Field kit, High Lift arrangement
Field kit, hydraulic third valve
Kit, joy stick
Printer kit for the Payload Control
System

Anti-Corrosion Arrangement

providing extensive protection to vital
machine components and other surfaces
in harsh corrosive applications.

Waste Handling Arrangement

providing extensive guarding and
machine modifications (e.g. trash grill),
yet allowing easy access for cleaning
and maintenance.

Airborne Debris Cooling system

938G Wheel Loader

HEHL5221-3 (03/2001) hr

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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