163H
Motor Grader

European Version

Cat® 3176C ATAAC Engine	
Variable Horsepower Arrangement	
gears 1-3	134 kW/180 hp
gears 4-8	149 kW/200 hp
Variable Horsepower Plus Arrangement	
gears 1-3	134 kW/180 hp
gears 4-6	149 kW/200 hp
gears 7-8	164 kW/220 hp

Gross Vehicle Weight	
Base	16 280 kg
front wheels	8310 kg
rear wheels	14 970 kg
Maximum	23 280 kg
front wheels	4590 kg
rear wheels	11 690 kg
Moldboard Blade Width	4267 mm

163H Motor Grader

The 163H blends productivity and durability to give you the best return on your investment.

Engine

✔The Cat 3176C ATAAC is designed to handle the tough loads. Variable Horsepower matches torque curves to the gear, to maximize response, power and efficiency. Low fuel consumption reduces operating costs and reduces environmental impact. **pg. 4**

Power Train

The power shift transmission takes full advantage of the powerful 3176C engine. Variable Horsepower uses specific torque curves for each gear range for optimum performance. Dual air system and multi-disc oil brakes assure reliable braking control. **pg. 5**

Hydraulics

The load-sensing hydraulic system lowers power consumption and system heat. The advanced PPPC control valves provide low lever effort, balanced flow and consistent cylinder speeds for outstanding blade control. Blade float is incorporated into the blade lift valves. **pg. 6**

Operator's Station

✔Low effort blade controls, electronic throttle control, EMS III monitoring system, and improved ventilation provide world-class operator control and comfort. Improved visibility to the front and rear increase operator confidence and productivity. **pg. 10**

All-Wheel Drive System

All-wheel drive improves tractive performance in poor underfoot conditions. The Variable Horsepower feature comes standard on the 163H. With three operating modes – automatic, manual, and off – the operator can match performance to any application. **pg. 8**

Caterpillar has matched and balanced all power train components, hydraulic systems, and structural elements to deliver a superior motor grader. Include the best operator station in the industry and world-class dealer support, and the Cat 163H represents a reliable, cost-effective investment.

✔*New feature*

Drawbar, Circle, Moldboard
Versatile moldboard positioning and a long wheelbase improve material handling. Rugged construction and replaceable wear parts minimize operation costs. **pg. 7**

Environmentally Responsible Design
New engine arrangements and operator station designs reduce emissions and meet current and anticipated regulations for interior and exterior sound levels, emissions, exhaust. **pg. 12**

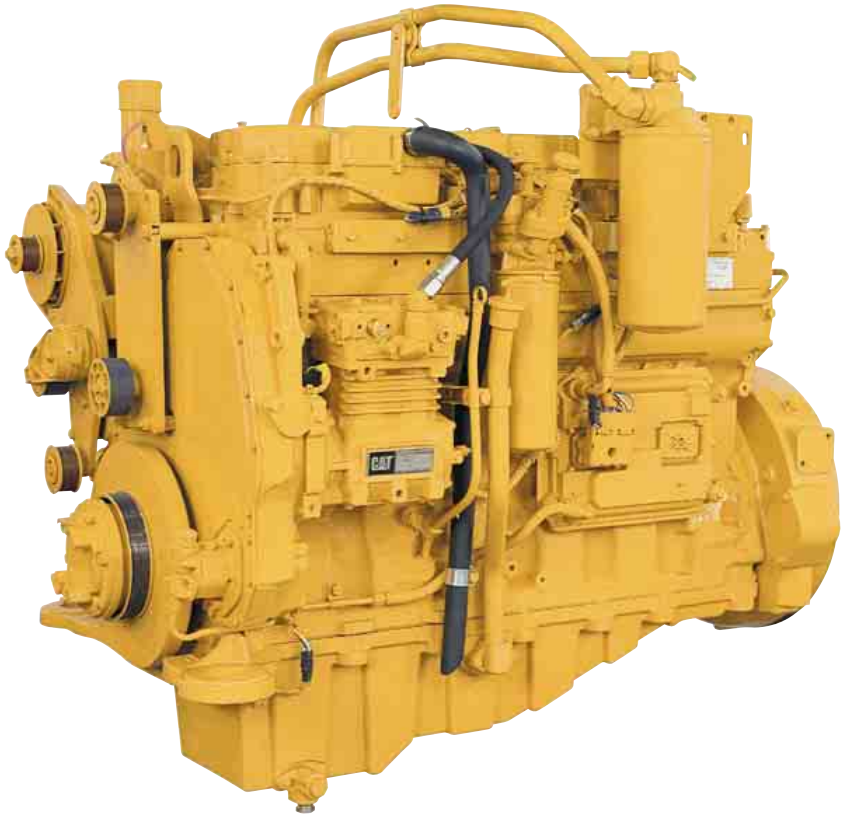
Serviceability
✔Caterpillar® re-engineered inspection and service points, grouping them into a convenient left-hand side, ground level 'service center.' Ground level fueling and extended engine and hydraulic oil change intervals help minimize downtime. **pg. 9**

Structures
The 163H frame is designed and built for versatility and durability. **pg. 6**

Customer Support
Your Cat dealer offers a range of services that help you operate longer with lower costs. **pg. 13**

Cat 3176C ATAAC Engine

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



Cat 3176C ATAAC Engine. The innovative 3176C diesel engine delivers large-engine performance from a compact engine design. The six-cylinder engine is turbocharged and air-to-air aftercooled. With high displacement and low rated speed, this engine provides excellent fuel economy and durability that can significantly reduce operating costs.

Improved Torque. Power curves customized for the 163H increase peak torque for higher ground speeds and enhanced productivity. Rimpull has been increased in all gears for greater productivity.

Variable Horsepower (VHP) and VHP Plus. Automatically increases horsepower in higher gears when the machine can use it and when all-wheel-drive is engaged. In applications such as snow removal, this power allows higher travel speeds and faster snow removal for more snow clearing in less time. Also, the higher rimpull in all gears maximizes performance during high-speed winging and heavy snow load applications. In lower gears where traction is limited, horsepower is limited, reducing wheel slip, tire wear and conserving fuel.

- The 163H has a VHP Plus option to provide additional horsepower in forward gears 7-8.

Lugging Performance. High torque output and torque rise makes the 3176C very responsive. Its superior lugging maintains consistent grading speeds without the need to downshift.

Advanced fuel system. The advanced Diesel Engine Module (ADEM III) fuel system is a Caterpillar exclusive electronic control module which provides improved engine response, performance, fuel efficiency, troubleshooting, diagnostics, and reduced emissions. The ADEM III electronic engine control improves altitude capability to 3000 meters without deration and allows integration with the electronic transmission control for maximum power train efficiency.

Turbocharged and Air-to-air aftercooled. Turbocharger packs more dense air into the cylinders for more complete combustion and lower emissions improving performance and engine efficiency. These benefits are especially useful at high altitudes. Air-to-air aftercooler reduces smoke and emissions by providing a cooler inlet air for more efficient combustion. This also extends the life of the piston rings and bore.

Extended Engine Life. The large bore-stroke design and conservative power rating minimize internal stresses and increase component life. The low engine speeds reduce engine wear and sound levels.

Hydraulic Demand Fan. The hydraulic demand fan control automatically adjusts cooling fan speed according to engine cooling requirements. This system reduces demands on the engine, putting more power to the ground and improving fuel efficiency.

Caterpillar engine oil. It is formulated to optimize engine life and performance and is strongly recommended for use in Cat diesel engines. The engine oil change interval is increased to 500 hours.

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

Emissions Compliant. The new 163H has reduced NOx, hydrocarbon, and particulate emissions. The Cat 3176C meets or exceeds all U.S. EPA Tier II and EU Stage II emissions control standards worldwide.

Power Train

Matched Caterpillar components deliver smooth, responsive performance and reliability.

Power Shift Transmission. Designed and built specifically for Cat motor graders, the rugged transmission provides on-the-go, full-power shifting as well as inching capability.

Direct Drive. Delivers superior fuel efficiency and "feel" of blade loads, material hardness and ground speed.

Gear Selection. Eight forward and six reverse speeds offer a wide operating range for maximum flexibility. Four gears below 10.3 km/h match working speed to job conditions for maximum productivity in earthmoving jobs. Gears five, six and seven are optimal for efficient snow removal operations. Gear 8 is designed for roading.

Electronic Transmission Control. Produces easy, smooth shifts to maintain uniform surfaces during shifting, and extends transmission life by reducing stress on transmission clutches. A single lever controls direction, gear and the parking brake.

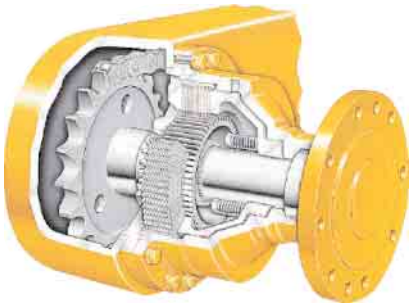
Electronic Clutch Pressure Control. ECPC smoothes shifts and improves inching control, which increases operator comfort and productivity. It uses input from the transmission and operator controls to modulate the directional clutches and produce consistent shifting.

Electronic Overspeed Protection. The transmission control upshifts the transmission to relieve overspeed conditions. The transmission control will also prevent a downshift until machine speed is within the range for the requested gear. This can prevent damage and reduce component wear.

Inching Pedal. Delivers precise control of machine movements in any gear with low pedal effort and excellent modulation, critical in close-quarter work or finish grading. A new pedal design and location improves modulation and operator comfort.

Autoshift. Improves ease of operation and maximizes productivity by automatically shifting the transmission at optimal shift points.

Dual Certified Air Tanks. Supply braking capacity to each side of the machine. This system ensures secondary braking capability in the event a failure occurs in a single brake line. The dual air system also has a large reserve for stalled-engine braking.



Brakes. Caterpillar multi-disc brakes offer a large surface area for dependable, extended-life braking. The air-actuated service brakes, located in each of the four wheel spindle housings, are sealed, adjustment free, and lubricated and cooled by tandem housing oil. The parking/ emergency brakes, located in the transmission on the output shaft, are spring actuated and air pressure released. When engaged, they neutralize the transmission and lock the wheels on any surface.

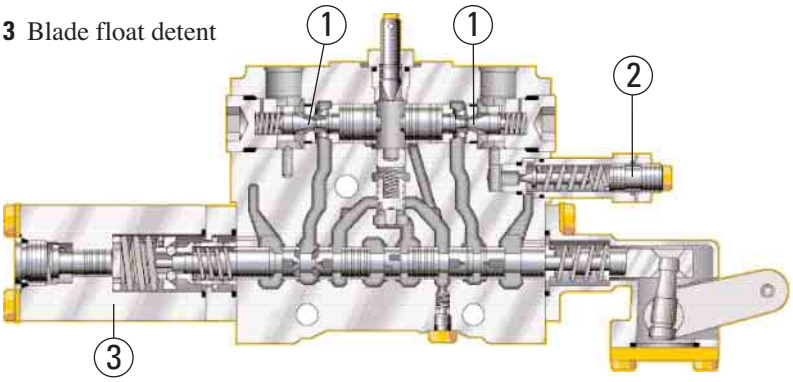
Hydraulics

Balanced hydraulics provide predictable blade response.

1 Lock valve

2 Line relief valve

3 Blade float detent



Load Sensing Hydraulics. A load sensing variable displacement pump and the advanced proportional priority pressure-compensating (PPPC) hydraulic valves provide superior implement control and enhanced machine performance and efficiency. Continuously matching hydraulic flow and pressure to power demands creates less heat and reduces power consumption.

Implement Control Valves. PPPC valves have different flow rates for the head and rod ends of the cylinder. This insures consistent extension and retraction properties for each cylinder, and improves operator 'feel' and system response. All control valves use lock valves to maintain blade settings. Line relief valves protect cylinders from excessive pressure.

Balanced Flow. Hydraulic flow is proportioned to ensure all implements operate simultaneously. If demand exceeds pump capacity, all cylinders are reduced by the same ratio. The result is improved productivity in virtually any application.

Blade Float. Blade float, incorporated into the blade lift control valves, allows the blade to move freely under its own weight. By floating both cylinders, the blade can follow the contours of the road when removing snow. Floating only one cylinder permits the toe of the blade to follow a hard surface while the operator controls the slope with the other lift cylinder.

Independent Oil Supply. Large separate hydraulic oil supply prevents cross-contamination and provides proper oil cooling, which reduces heat build-up and extends component life.

Heavy Duty XT Hose. Caterpillar hose technology allows high pressures for maximum power and reduced downtime, and intelligent routing minimizes exposure to damage.

Hydraulic Lockout. Mechanically locks all moldboard, machine, and attachment control levers during machine roading. This prevents implements from being accidentally engaged when the motor grader is travelling down the road.

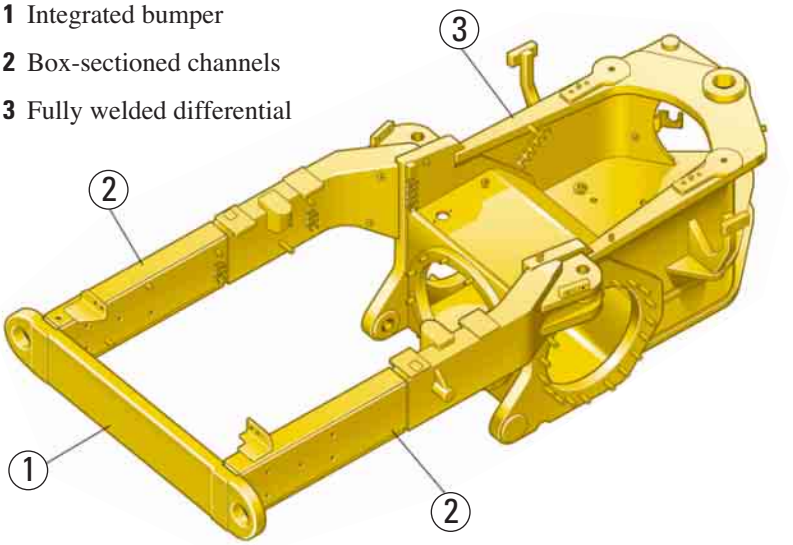
Structures

The 163H frame is designed for versatility and durability.

1 Integrated bumper

2 Box-sectioned channels

3 Fully welded differential



Integrated Bumper. The integrated bumper ties the rear frame together into a cohesive unit, to handle the loads possible with the new 3176C power train. This is especially important in ripping and snow removal applications where graders are equipped with snow wing attachments.

Rear Frame. Rear frame has two box-sectioned channels integral with fully welded differential case for a solid working platform.

Front Frame. Continuous top and bottom plate construction provides consistency and strength. The flanged box section design removes welds from high stress areas, improving reliability and durability, and increasing resale value for the customer.

Drawbar, Circle, Moldboard

Every component is designed for maximum productivity and durability.

1 Nylon composite wear inserts

Blade. Heat treated moldboard rails, tough-hardened cutting edge and end bits, and large diameter bolts assure reliability and longer service life.

Blade Positioning. The blade linkage design provides extensive moldboard positioning, most beneficial in mid-range bank sloping and in ditch cutting and cleaning.

Blade Angle. A long wheelbase allows the operator to obtain an aggressive moldboard angle. This aggressive angle permits material to roll more freely along the blade, which reduces power requirements. This is particularly helpful in handling very dry materials, cohesive soils, snow and ice.

Circle Construction. One-piece forged circle with hydraulically driven motor stands up to high stress loads. Raised wear surfaces prevent circle teeth wear against the drawbar. Sixty-four uniformly spaced teeth on the front 240° of the circle are flame cut and heat induction hardened to resist wear. And the circle, with 360° rotation, is secured to the drawbar by six vertically and horizontally adjustable shoes for maximum support.

Replaceable Wear Items. Tough, durable nylon composite wear inserts are located between the drawbar and circle, and between the support shoes and circle. This sacrificial wear system helps keep components tight for fine grading and allows easy replacement. These inserts reduce rotational friction resulting in extended component life.

Circle Drive Slip Clutch. The standard circle drive slip clutch protects the drawbar, circle and moldboard from shock loads when the blade encounters immovable objects. It also reduces the possibility of the grader making abrupt directional changes in poor traction conditions.

Drawbar Construction. The Y-frame drawbar is constructed of two solid beams for high strength and optimum durability, as well as precise blading control. And the yoke plate completely covers the top of the circle.

Blade Lift Accumulators. These optional blade lift accumulators absorb vertical shocks encountered when the moldboard contacts immovable objects. This option is especially useful in rough grading and rocky areas.

All-Wheel Drive System

All-wheel drive extends the machine's working range in poor underfoot conditions.

Superior Traction. All-wheel drive improves tractive performance in poor underfoot conditions such as snow, mud, and sand. This feature also provides excellent steering and side-draft control.

More Power. The Variable Horsepower feature is standard on the 163H. When all-wheel drive is engaged, Variable Horsepower kicks in and delivers maximum power in all gears via an electronically controlled variable displacement piston pump driven directly from the transmission.

Wide Working Range. All-wheel drive is available in gears 1-7 forward and 1-5 reverse, making it effective in both low-speed and high-speed applications – from ditch cutting to snow winging. Electronically controlled dual displacement wheel motors deliver high displacement in gears 1-4 forward and 1-3 reverse, and low displacement in gears 5-7 forward and 4-5 reverse. Front wheels freewheel in 8 forward and 6 reverse.

Three Operating Modes.
Three operating modes are available – automatic, manual, or off. The operator selects the operating mode using a rocker switch on the transmission console.

- **Automatic mode** makes the all-wheel drive feature easy to use. It automatically increases torque to the front wheels as rear wheel slip increases. The operator controls the responsiveness of the front wheel by adjusting the torque control lever. The farther forward the lever, the more rapidly front wheel torque will increase as slip increases. This mode provides power to the front wheels only when needed, which reduces hydraulic system heat and lowers power consumption. It also allows the operator to focus all his attention on his work.
- **Manual mode** gives the operator 100 percent control. He adjusts the torque control lever to set a constant torque level to the front wheels. He can make torque setting adjustments as operating conditions change. There are many situations where an operator may want to control the front wheels independent of rear wheel slip such as when trying to remove a machine from a snow drift; when making a tight turn on snow, mud, or sand; or when working on a side slope.

Serviceability

Re-engineered inspection and service points reduce downtime and operating costs.

Service Center. A 'Service Center' on the left-hand side provides easy, centralized access to most check and maintenance points. Routine inspection and service are faster and easier, for better machine availability and lower operating costs.

- Large hinged doors provide easy access to the adjacent engine and maintenance service compartments.
- Engine and hydraulic oil checkpoints, coolant gauges, and air filters
- Spin-on filters for oils, fuel, coolant
- Remote lubrication points, purge valves and ecology drain lines
- Fuse panel with new automotive style fuses located inside cab
- Tandem oil checkpoint is conveniently located between the wheels in the center of the tandem.
- Sample ports for engine, hydraulic, transmission fluids, coolant and fuel, encourage preventive maintenance and diagnostics like the S•O•S℠ program.

Fuel Tank. The 397 liter, ground level fuel tank allows longer work shifts and reduces refueling times. A fuel tank sediment drain enables the operator to remove sediment accumulation, reducing the risk of fuel system damage.

Extended Oil Change Interval. Operate a full 500 hours between engine oil and filter changes, 4000 hours between hydraulic oil changes, and 6000 hours between engine coolant changes. This reduces downtime and operating expense.

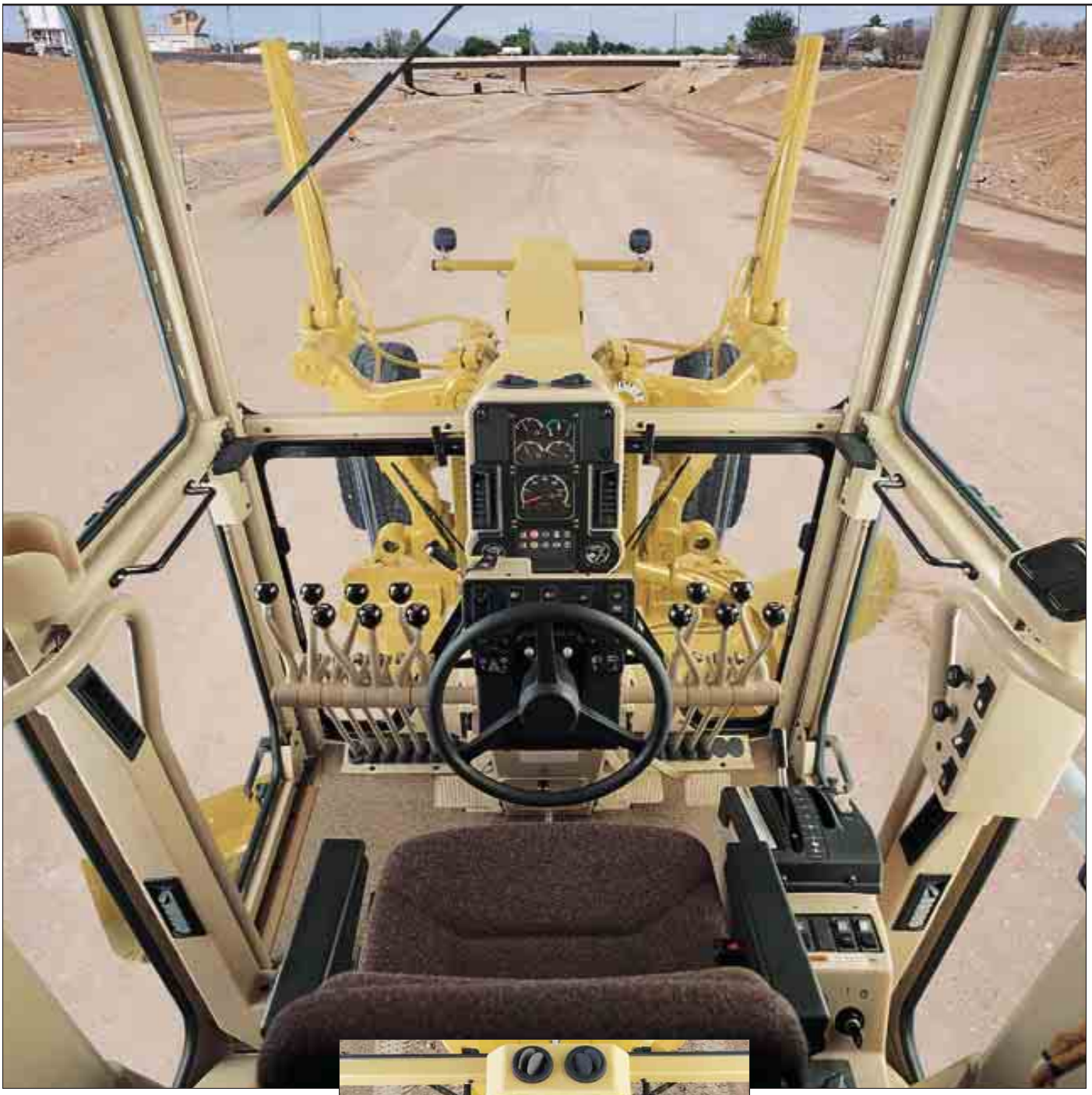
Cat XT Hose. Caterpillar XT hose technology allows high pressures for maximum power and reduced downtime, and intelligent routing minimizes exposure to damage.

O-Ring Face Seals. Cat O-ring face seals assure rock-solid connections that maintain pressure and reduce oil leaks. Intelligent hose routing minimizes exposure to damage, increasing hose life and enhancing reliability.

Radiator Cleanout Access. Radiator clean-out access gives the operator the ability to clear away debris and other materials that build up around the radiator. This ensures that the radiator functions properly keeping the engine cool and increasing component life.

Operator's Station

The 163H includes innovative changes to improve operator efficiency and maximize machine productivity.



Comfort and Convenience. Comfort and convenience are designed into every feature of the operator's station.

Autoshift Transmission. Improves ease of operation and maximizes productivity by automatically shifting the transmission at optimal shift points.

Optimized Inching Modulation. The new Electronic Clutch Pressure Control (ECPC) optimizes inching modulation and smoothes shifting. It also eliminates cable control, improving reliability and enhances cold oil characteristics.

All-Wheel Drive. Using the rocker switch on the transmission console, the operator can choose from three operating modes – automatic, manual, or off. The torque control lever allows the operator to control the aggressiveness of the front wheels in both active modes.

Electronic Throttle Control. ETC provides easier, more precise, more consistent throttle operation. Two modes on a single switch offer flexibility for varying applications and operator preference. Like cruise control, ETC improves fuel efficiency.

Electronic Monitoring System. Powerful monitoring and diagnostic capabilities allow more efficient and safer machine operation. The Cat EMS III keeps operators better informed of machine status with:

- Continuous tracking of all critical machine parameters on a dash display
- Warnings/alerts for abnormal conditions
- Retrieval or adjustment of over 200 electronic system parameters using the powerful ET service tool

Controls On Steering Console. Controls and switches are located on the steering console, shift console and right cab post, all within easy reach. Gauges are located inside the cab, directly in front of the operator.

Backlit Controls. Rocker switches and transmission shifter are backlit for nighttime operation.

Air Conditioner and Heater-Pressurizer. The optional air conditioner arrangements help create a comfortable work environment. A cab heater-pressurizer is standard. The high-capacity systems dehumidify air and pressurize the cab, while circulating fresh air and sealing out dust. Multiple additional vents evenly distribute air throughout the cab for clear windows and operator comfort.

Suspension Seat. Standard contour series suspension seat features fold-up armrests and a retractable seat belt. The seat can easily adjust for optimal support and comfort. Seat controls are located within easy reach and in plain view.

Fresh Air Filters. Located above each cab door for quick replacement.

Optional 12V Power Port. Available for use with computers, cellular phones or other electronic equipment.

Exceptional Visibility. A redesigned operator's console improves forward visibility. Large side windows allow a clear view of the moldboard heel and tandem tires. A wide rear window and tapered engine hood provide a good view to the rear of the machine. Moving the air dryer and air cleaner, and aligning the precleaner and muffler, improves visibility to the rear of the machine. Operators can work more confidently and efficiently.

Environmentally Responsible Design

Caterpillar builds machines that help you create a better world.

Quiet Cab. The resiliently mounted engine and transmission reduce interior engine noise and vibration. Interior sound levels do not exceed 72 dB(A), using ISO 6394. Lower interior noise levels improve operator working conditions.

Quiet Machine. Exterior sound levels are below 107 dB(A) and comply with the EU 2000/14/EC sound limit of 109 dB(A). This quiet operation lets the 163H work with minimal disturbance to the surroundings.

Low Emissions. The 163H Motor Grader is even more environmentally friendly than its predecessors with reductions in NOx, hydrocarbon, and particulate emissions. It meets or exceeds all U.S. EPA Tier II and EU Stage II emissions control standards worldwide.

Fuel Efficient. Caterpillar state-of-the-art electronically controlled, unit injection fuel system has high injection pressure for complete fuel combustion, increased fuel efficiency and reduced emissions.

Dry Machine. Lubricant fill points and filters are designed to minimize spillage. O-ring face seals, Cat XT hose and Cat hydraulic cylinders protect against leaks.

Extended Oil Change Interval. Operate a full 500 hours between engine oil and filter changes, and 4000 hours between hydraulic oil changes. This reduces machine downtime and operating expense, and helps preserve our natural resources.

Ecology Drains. Make regular maintenance easier and help prevent spills when changing fluids.

Ozone Protection. To help protect the earth's ozone layer, air-conditioning units use a refrigerant free of chloro-flourocarbons (CFCs).

Customer Support

Cat dealer services help you operate longer with lower costs.

Product Support. You will find nearly all parts at our dealer parts counter. Cat dealers use a world-wide computer network to find in-stock parts to minimize machine down time. Save money with genuine Cat Reman parts. You receive the same warranty and reliability as new products at substantial cost savings.

Machine Selection. Make detailed comparisons of the machines under consideration before purchase. Cat dealers can estimate component life, preventive maintenance cost, and the true cost of lost production.

Purchase. Look past initial price. Consider the financing options available as well as day-to-day operating costs. Look at dealer services that can be included in the cost of the machine to yield lower equipment owning and operating costs over the long run.

Customer Support Agreements. Cat dealers offer a variety of product support agreements, and work with customers to develop a plan that best meets specific needs. These plans can cover the entire machine, including attachments, to help protect the customer's investment.

Operation. Improving operating techniques can boost your profits. Your Cat dealer has videotapes, literature and other ideas to help you increase productivity, and Caterpillar offers certified operator training classes to help maximize the return on your machine investment.

Maintenance Services. Talk to your dealer about the range of available maintenance services. Repair option programs guarantee the cost of repairs up front. Diagnostic programs such as S•O•S℠ and Coolant Sampling and Technical Analysis help avoid unscheduled repairs.

Replacement. Repair, rebuild or replace? Your Cat dealer can help you evaluate the cost involved so you can make the right choice.

Engine

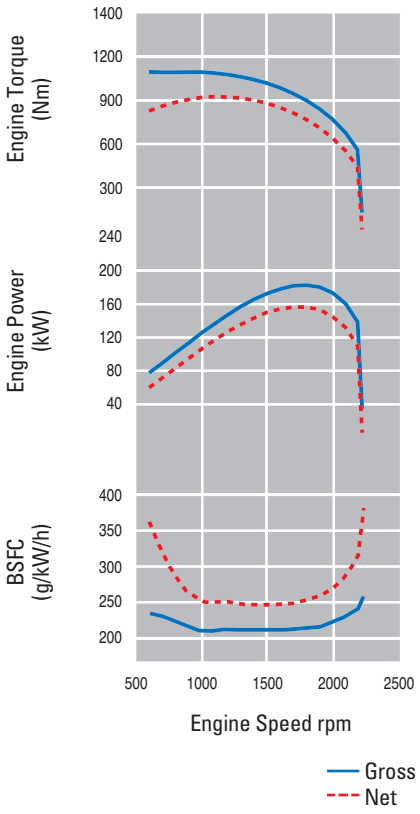
Cat 3176C ATAAC engine, Variable horsepower (VHP)

Net power	kW	hp
VHP		
gears 1-3	134	180
gears 4-8	149	200
VHP Plus		
gears 1-3	134	180
gears 4-6	149	200
gears 7-8	164	220
Gross power		
VHP		
gears 1-3	162	217
gears 4-8	177	237
VHP Plus		
gears 1-3	162	217
gears 4-6	177	237
gears 7-8	192	257

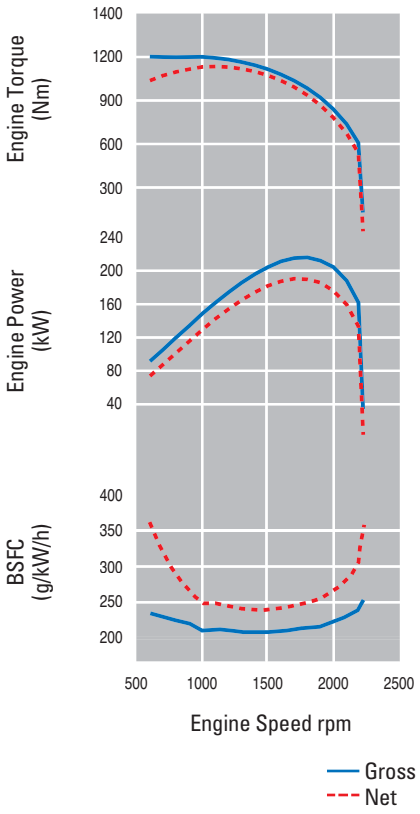
Displacement	10.3 liters
Bore	125 mm
Stroke	140 mm
Torque rise	50 %
Max torque at 1000 rpm	1095 Nm
Speed at rated power	2000 rpm
Number of cylinders	6
Derating altitude	3000 m
Standard Fan speed	
maximum	1210 rpm
minimum	500 rpm
Standard Ambient Capability	47 C°
High Ambient Fan speed	
maximum	1300 rpm
minimum	500 rpm
High Ambient Capability	50 C°

- The engine is certified according to the EU Directive 97/68/EC, Stage II
- Net power is tested per ISO 9249, and EEC 80/1269 standards in effect at the time of manufacture.
- VHP Plus is optional.
- Net power advertised is the power available at rated speed of 2000 rpm, measured at the flywheel when engine is equipped with fan, air cleaner, muffler and alternator.
- No derating required up to 3000 m altitude. Deration rate of 1.5% per 300 m above 3000 m.

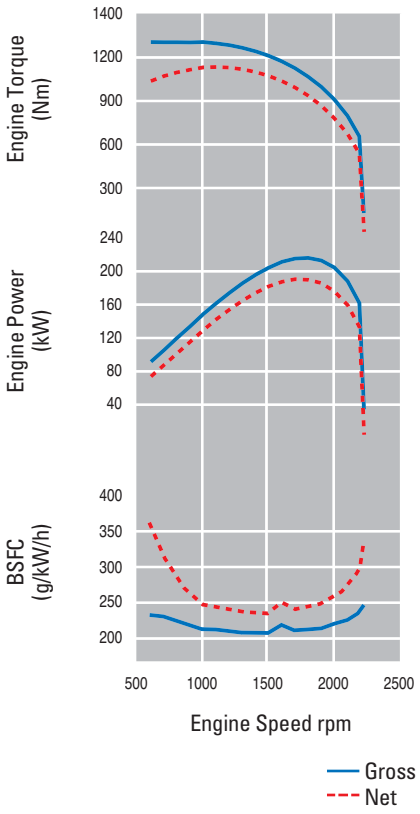
VHP **Gears 1-3**
VHP Plus **Gears 1-3**



Gears 4-8
Gears 4-6



Gears 7-8



Power Train

Gears	
Forward	8
Reverse	6
Transmission	Direct drive, power shift
Brakes	
Service	air-actuated, oil-disc
surface area	23 948 cm^2
Parking	manual, multiple oil-disc
Secondary	air actuated, oil-disc

Hydraulic System

Circuit type	Closed center load sensing
Pump type	axial piston
Pump output at 2100 rpm	206 L/min
Maximum system pressure	24 150 kPa
Reservoir tank capacity	53 L
Standby pressure	3100 kPa

Tandems

Height	572 mm
Width	201 mm
Sidewall thickness	
inner	16 mm
outer	18 mm
Drive chain pitch	51 mm
Wheel axle spacing	1522 mm
Tandem oscillation	
forward	15°
reverse	25°

Operating Specifications

Top Speed	
Forward	43.6 km/h
Reverse	34.4 km/h
Turning radius (outside front tires)	7.5 m
Steering range	
left/right	50°
Articulation angle	
left/right	20°
Maximum travel speeds*	
Forward	km/h
1st	3.8
2nd	5.1
3rd	7.5
4th	10.3
5th	16.0
6th	21.8
7th	30.0
8th	43.6
Reverse	
1st	3.0
2nd	5.6
3rd	8.1
4th	12.6
5th	23.7
6th	34.4

* at rated rpm with conventional base 14.00-24 12PR tires

Frame

Circle diameter	1530 mm
Drawbar	
height	127 mm
thickness	76 mm
Front-top/bottom plate	
width	305 mm
thickness	25 mm
Front-side plates	
width	241 mm
thickness	12 mm
Front-liner weights	
minimum	165 kg/m
maximum	213 kg/m
Front-section modulus	
minimum	2083 cm^3
maximum	4785 cm^3
Front axle	
ground clearance	625 mm
front wheel lean	18°
oscillation angle	32°
Circle blade beam thickness	30 mm

Moldboard

Blade width	4267 mm
Moldboard height	686 mm
Thickness	25 mm
Arc radius	413 mm
Throat clearance	90 mm
Cutting edge	
width	203 mm
thickness	16 mm
End bit	
width	203 mm
thickness	16 mm
Blade pull*	
max GVW	20 953 kg
base GVW	14 652 kg
Down pressure	
max GVW	14 365 kg
base GVW	7932 kg

* Blade Pull calculated at 0.9 traction coefficient, which is equal to ideal no-slip conditions, and Gross Vehicle Weight (GVW).

Blade Range

Circle centershift	
right	881 mm
left	848 mm
Moldboard sideshift	
right	943 mm
left	851 mm
Maximum blade position angle	90°
Blade tip range	
forward	40°
backward	5°
Maximum shoulder reach outside of tires	
right	2261 mm
left	2223 mm
Maximum lift above ground	452 mm
Maximum depth of cut	770 mm

Ripper

Ripping depth, maximum	462 mm
Ripper shank	
holders	5
holder spacing	533 mm
Penetration force	8047 kg
Pryout force	9281 kg
Machine length increase, beam raised	970 mm

Brakes

- Brakes meet the standard ISO 3450:1996.

Scarifier

Front, V-Type	
Working width	1184 mm
Scarifying depth, maximum	292 mm
Scarifier	
shank holders	11
shank holder spacing	116 mm
Rear	
Working width	2300 mm
Ripping depth, maximum	411 mm
Scarifier	
shank holders	9
shank holder spacing	267 mm

All-Wheel Drive System

Pump output (2500 rpm)	175 L/min
Operating pressure	
maximum	35 000 kPa
minimum	5500 kPa
Motor displacement	
high	1650 cc/rev
low	660 cc/rev

ROPS/FOPS

- ROPS (Rollover Protective Structure) offered by Caterpillar for the machine meets ROPS criteria ISO 3471-1994.
- FOPS (Falling Object Protective Structure) meets ISO 3449-1992 Level II.

Cab

- The operator sound level measured according to the procedures specified in ISO 6394:1998 is 72 dB(A), for 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 labeled sound power level is 109 dB(A) measured according to the test procedures and conditions specified in 2000/14/EC.

Weights

	kg
Gross Vehicle Weight*	
maximum	23 280
front wheels	8310
rear wheels	14 970
base	16 280
front axles	4590
rear axles	11 690

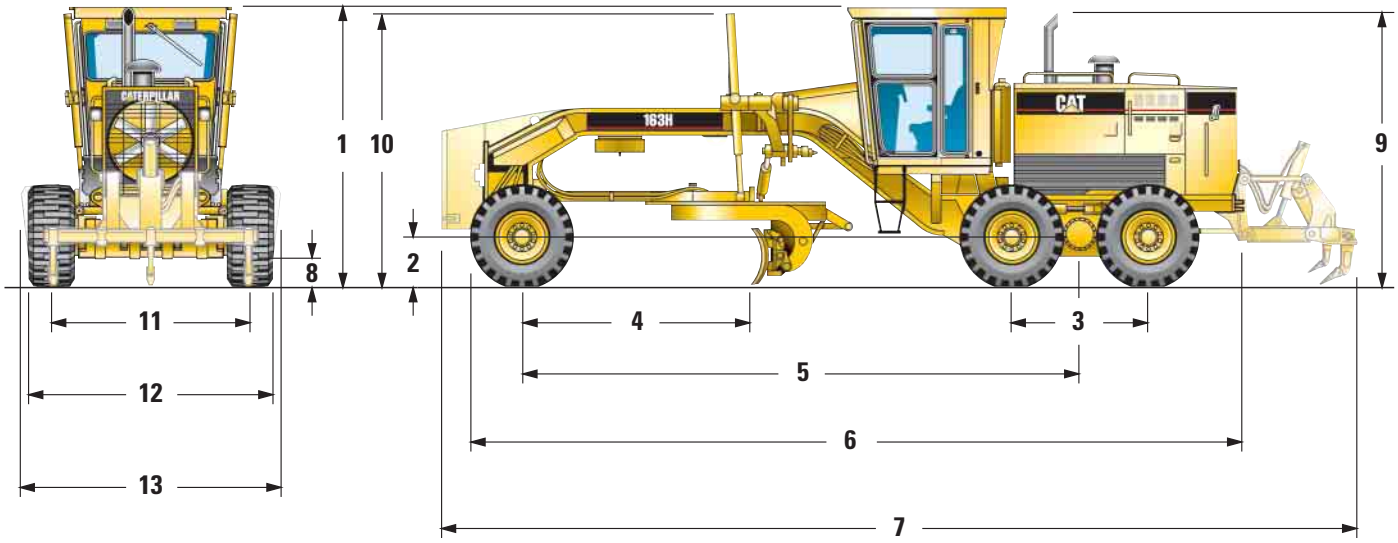
* Base operating weight calculated on standard machine configuration with 14.00-24 12PR (G-2) tires, full fuel tank, coolant, lubricants and operator.

Service Refill

	Liters
Fuel tank	397
Cooling system	38
Hydraulic system	
total	80
tank	38
Engine oil	39
Differential/Final drives	47
Tandem housing (each)	80
Front wheel spindle bearing housing	0.5
Circle drive housing	7

Dimensions

All dimensions are approximate. Based on standard machine configuration with 14.00-24 12PR tires.



1	Height	
	low profile cab	3131 mm
	high profile cab	3356 mm
	no cab	3103 mm
2	Height to axle	600 mm
3	Length	
	between tandem axles	1523 mm
4	Length	
	front axle to moldboard	2518 mm
5	Length	
	front axle to mid tandem	6169 mm
6	Length	
	front tire to end of rear frame	8713 mm
7	Length	
	counterweight to ripper	10 097 mm
8	Ground clearance at transmission case	344 mm
9	Height to exhaust stack	3103 mm
10	Height to top of cylinders	3028 mm
11	Width	
	tire center lines	2091 mm
12	Width	
	outside rear tires	2457 mm
13	Width	
	outside front tires	2553 mm

Standard Equipment

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

Electrical

Alarm, back-up
Alternator, 75 ampere, sealed
Batteries, maintenance free,
  1100 CCA
Electrical system, 24 volt
Lights, stop and tail
Motor, starting
Product Link connection

Operator Environment

Accelerator
Ashtray and lighter
Autoshift function
Coat hook
Control console, adjustable
Cup holder
EMS III operator warning system
Panel gauges inside the cab
  fuel
  articulation
  engine coolant temp
  system voltage
  air brake pressure
Heater, pressurizer
Hydraulic controls, load sensing
  right/left blade lift with float position
  blade sideshift and tip
  circle drive
  centershift
  front wheel lean
  articulation
Lockout, hydraulic control
Meter, hour, digital
Mirrors
  outside mounted
  inside, rearview, wide angle
Mounting bracket, general purpose
Power steering, hydraulic
ROPS cab, sound suppressed,
  low profile
Seat, cloth, contour suspension
Seat belt, retractable 76 mm
Speedometer, tachometer with odometer
Steering wheel, tilt, adjustable
Storage area for cooler/lunchbox
Sunscreen, front windshield
Throttle control, electronic
Transmission gear and direction
  indicator, digital
Washer/wipers
  (3) intermittent front windshields
  (1) intermittent rear windshield
Windows, fixed lower front

Powertrain

Air cleaner
  dry type radial seal
  service indicator
  automatic dust ejector
Air to air after cooler (ATAAC)
Brakes - oil disc, four-wheel air
  actuated
Demand fan, blower
Differential, lock-unlock
Engine, 3176C ATAAC diesel VHP
  automatic derate
  automatic idle control
Fuel tank, sediment drain
Fuel-water separator
Lube for life pump drive shaft
Muffler, under hood
Parking brake - multi-disc, sealed
  and oil cooled
Pre-screener
Priming pump, fuel
Serpentine belt, automatic tensioner
Tandem drive
Transmission, autoshift
  8 forward/6 reverse speeds
  power shift
  direct drive
  electronic shift control
  overspeed protection

Other Standard Equipment

Antifreeze -35°C
Bumper, rear, integrated, with hitch
Clutch, circle drive slip
Cutting edges
  152 mm x 16 mm (6"x 5/8")
  curved DH-2 steel
  16 mm (5/8") mounting bolts
Doors, engine compartment, locking
Drawbar
  6 shoe
  replaceable wear strips
Endbits - 16 mm (5/8") DH-2 steel,
  16 mm (5/8") mounting bolts
Engine shutdown, ground level
Frame, articulated with safety lock
Fuel tank, 397 Liters
Fueling, ground level
Horn, air
Moldboard
  4267 mm x 686 mm x 25 mm
  (14"x 27"x 1")
  hydraulic sideshift and tip
Radiator cleanout access
S•O•S℠ ports: engine, hydraulic,
  transmission, coolant, fuel
Sound suppression, EU
Steering, secondary
Tool box

Tires, Rims and Wheels

Partial allowance: 14.00-24 12PR on
  9" single piece rims

European roading group which provides an additional air tank, air circuit protection valve and two position lights with integral turn signals.
Dealer supplied equipment is required to meet some specific country on-road requirements.

Optional Equipment

With approximate changes in operating weights.

	kg
Accumulators, blade lift	71
Air conditioner	31
Air dryer	13
Batteries, extreme duty, 1300 CCA	15
Blade	
3658 mm x 688 mm x 25 mm (12'x 27"x 1")	151
3962 mm x 686 mm x 25 mm (13'x 27"x 1")	164
4267 mm x 610 mm x 22 mm (14'x 24"x 7/8")	75
4267 mm x 688 mm x 25 mm (14'x 27"x 1")	261
front-mounted	
2750 mm x 980 mm	1180
2000-2935 mm x 790 mm (foldable ends)	1525
2500 mm x 800 mm	1100
Cab, ROPS, high profile, sound suppressed	77
Converter, 25-amp, 24-V to 12-V	5
Covers, louver with screen	7
Covers, lower rear frame	11
Covers, metallic, fuel tank	11
Cutting edges for 22 mm thick blade	–
203 mm x 19 mm for 3.7 m blade	–
203 mm x 19 mm for 4.1 m blade	–
203 mm x 16 mm for 3.7 m blade	–
203 mm x 16 mm for 4.1 m blade	–
Cutting edges for 25 mm thick blade	–
203 mm x 19 mm for 3.7 m blade	–
203 mm x 19 mm for 4.1 m blade	–
Endbits, overlay, reversible	11
Engine, VHP Plus	4
Ether starting aid	1
Extensions, blade 610 mm right and left	
for 22 mm thick blade	114
for 25 mm thick blade	148
Fan, defroster, front and rear	2
Graderbit system, penetration bit type	163

	kg
Guard, brake lines	8
Hammer, with mounting	5
Heater, engine coolant	1
Hydraulic arrangements with one or more additional hydraulic valves are available for front scarifier, rear ripper-scarifier, dozer, dozer angle, snow plow and snow wing. See dealer price list.	
Lighting systems:	
bar mounted, directional and headlights	13
cab mounted, directional and headlights	9
cab and bar mounted, directional, headlights and work lights	22
cab and bar mounted, high, directional, headlights and work lights	22
work lights, front and rear	6
snow wing light, right	18
warning light, cab mounted	3
Mirrors, dual, inside mounted	–
Mirrors, outside mounted, heated	8
Power port, 12-V	2
Precleaner, turbine-type	–
Push plate, front mounted	919
Radio ready, entertainment	–
Receptacle – starting, plug-in	2
Rims, tires – see dealer price list	
Ripper-scarifier, rear	961
Ripper-scarifier/tooth, one	33
Rear scarifier, shanks/teeth, nine	65
Scarifier, front mounted, V-type	845
Seat, cloth-covered, contour air suspension	–
Snow arrangements, refer to Snow Arrangement Supplement	
Sunshade, rear window	3
Windows, lower front, opening	3
Windows, sliding side	4

163H Motor Grader

HEHG5510 (10/2002) hr

Featured photos of machines may not always include standard equipment.
See your Caterpillar Dealer for available options.
Materials and specifications are subject to change without notice.

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