24H
Motor Grader

Cat® 3412E turbocharged diesel engine		
Flywheel power	373 kW	500 hp
Blade width	7.3 m	24 ft

Operating weights (approximate)		
On front wheels	18 400 kg	40,573 lb
On rear wheels	43 554 kg	96,038 lb
Total machine	61 955 kg	136,611 lb

Caterpillar® 24H Motor Grader

The 24H blends productivity and durability to give you the best return on your investment.

Power Train
The 3412E engine offers superior lugging performance, fuel efficiency and reliability. The Caterpillar power shift transmission with electronic automatic shifting features smooth, on-the-go shifting. To maximize productivity, it has six forward speeds and three reverse speeds. **pg. 4-5**

Hydraulics
The load-sensing hydraulic system lowers horsepower consumption and system heat. The control valves provide low lever effort, balanced flow and consistent control. **pg. 6**

Drawbar, Circle and Moldboard
The rugged construction of the drawbar, circle and moldboard, and use of replaceable wear inserts, provide durability and minimize maintenance costs. For extra protection in this high-impact area, two circle drive slip clutches and blade lift accumulators are standard. **pg. 7**

Matched and balanced components.
The Cat 3412E engine, power shift transmission and load-sensing hydraulics are designed to work together to deliver top productivity in all applications.

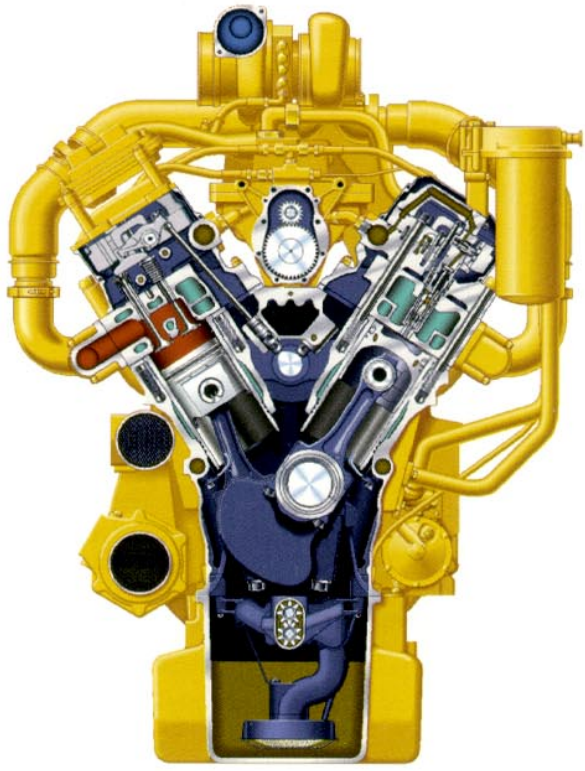
Superior visibility, control layout and operating ease.
The operator is the single most important factor in maintaining high productivity throughout the work day. By offering the best operator's station in the industry, Caterpillar helps operators achieve peak performance.

Operator's Station
Large windows ensure a clear view in all directions. A roomy interior, contour series suspension seat, low-effort controls and low sound levels create a productive work environment. **pg. 8-9**

Serviceability
Daily maintenance is easily performed with ground level access to major service points such as oil levels and fills, grease fittings and sight gauges. A diagnostic connector allows quick electronic analysis. **pg. 10**

Power Train

Matched Cat components deliver smooth, responsive performance and reliability.



Cat 3412E engine, with the hydraulically actuated, electronically controlled unit injector fuel system (HEUI), offers superior lugging performance, fuel efficiency and reliability. The 12-cylinder engine is turbocharged with a high displacement-to-horsepower ratio. This large displacement produces better lugging capability, lower internal stresses and longer component life.

Superior lugging performance. High torque output and high torque rise makes the 3412E engine very responsive. The engine's lugging capability allows it to pull through sudden, short-term increases in loads, reducing the need to downshift. As a result, the operator can maintain consistent, desirable working speeds, which means the work gets done faster.

HEUI Fuel System — Fuel efficiency and lower emissions. The HEUI system uses hydraulically actuated, electronically controlled unit injectors to pressurize and inject fuel, providing the optimal mix of fuel and air. This high injection pressure, coupled with precise electronic metering and timing of the fuel injection, results in superior fuel efficiency, improved engine performance and reduced emissions and operating noise.

- Flexible control of fuel injection timing, pressure and duration over the entire engine speed range assure faster engine response and improved performance in any application.
- High compression ratios ensure dependable cold starting performance and low emissions.

Electronic engine control. Precise electronic speed governing, active and logged diagnostics codes, cold start-up mode, low oil pressure warning/derate and high coolant temperature warning/derate are some of the features added by the electronic engine control to provide efficient and productive engine operation.

Long engine life. The large bore-stroke design and conservative power rating help minimize internal stresses and increase component life. A wide journal crankshaft with a large rod bearing surface significantly increases bearing life.

Ether starting aid comes standard on the 24H to help ensure engine starting in the extreme cold. The system monitors engine coolant temperature to prevent ether from being injected into a hot engine.

Power shift transmission. Caterpillar designs and builds transmissions specifically for Cat motor graders. The transmission provides on-the-go, full-power shifting as well as inching capability. A single lever controls direction and gear selection.

Gear selections. Six forward speeds and three reverse speeds give the operator a wide operating range. With three gear selections below 6.0 mph, the operator can precisely match working speeds to job conditions for maximum productivity in earthmoving and mining applications.

Lockup clutch torque converter. Permits the machine to operate in direct drive for more efficient operation at higher torque converter output speeds.

Planetary design. Balanced planetary transmission with large diameter oil-cooled clutch packs provides superior load distribution and heat dissipation, resulting in longer transmission life.

Control valves. Designed and manufactured by Caterpillar, they provide smooth, yet firm, engagement of direction and speed clutches. This reduces shock to power train components while permitting quick, smooth, automatic shifting. Smooth shifts reduce operator fatigue and help increase productivity.

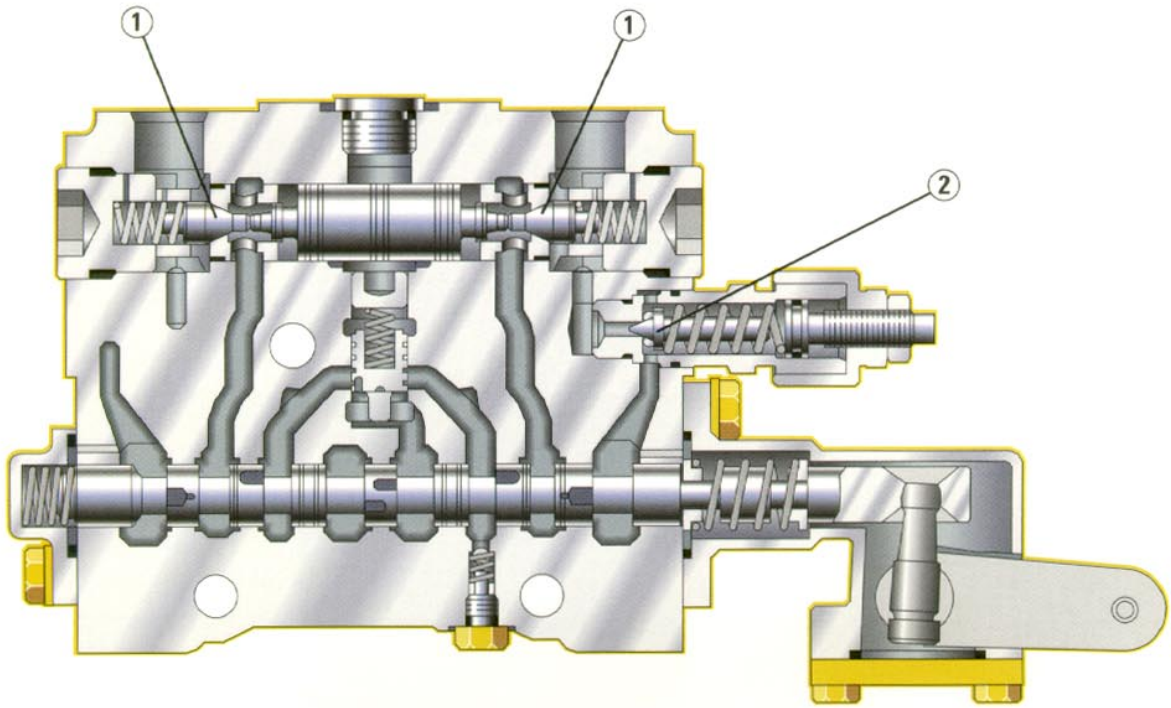
Transmission neutralizer. Available to disengage power to the wheels. The neutralizer is used to maintain full hydraulic flow while allowing the machine to slow travel speed (i.e., turning at the end of a haul road).

Oil-disc brakes. Caterpillar designs and builds multi-disc brakes that are completely sealed and adjustment-free. The brakes are oil-bathed, oil-actuated and spring-released. They are located at each tandem wheel to eliminate braking loads on the power train and to speed up servicing. The large brake surface provides dependable braking capability and long life before rebuild.

Parking brake. Spring-applied, oil-released. The transmission is neutralized when the parking brake is engaged.

Hydraulics

Balanced hydraulics deliver consistent, precise and responsive control.



Power on demand. Normally, the variable displacement pump idles at near-zero output. When it senses a load requirement, the pump supplies flow and pressure to match the demand. The result is less hydraulic system heat and lower horsepower consumption.

Control valves are designed and built by Caterpillar specifically for motor graders. They provide outstanding operator "feel" and predictable system response for unmatched control. To help maintain exact blade settings, lock valves are built into all control valves. Line relief valves are also incorporated into selected control valves to protect the cylinders from over-pressurization.

Secondary steering. Provides hydraulic oil flow, via a ground-driven pump, to the steering system if the engine fails or main hydraulic pump flow is lost while the machine is operating.

Low operator effort. Controls are designed to reduce operator fatigue. They feature short lever throws and low effort in both directions. Properly spaced control levers and short lever throws allow the operator to use multiple controls with one hand.

Balanced flow. When the operator uses several controls at one time, flow is proportioned to ensure all implements can operate simultaneously.

Large independent oil supply prevents cross-contamination and provides proper oil cooling, which means less heat build-up and longer component life.

1 Lock valve

2 Line relief valve

Drawbar, Circle and Moldboard

Every component is designed for maximum productivity and durability.

Rugged construction. The drawbar features an A-frame, box-section design for high strength. The bottom is machined to provide accurate adjustment and precise blading. A one-piece forged circle is built to stand up to high stress loads. To resist wear, teeth are flame-hardened in the front section. For maximum support, the circle is secured to the drawbar by eight support shoes with replaceable strips.

Tall moldboard and large throat clearance help move material more quickly and efficiently.

Full-length yoke plate gives strength, support and protection to the circle.

Replaceable wear items. Replaceable wear inserts are located between the drawbar and circle and between the eight support shoes and circle. This wear system helps keep components tight for fine grading and allows easy replacement. Caterpillar also uses replaceable wear items in the following areas:

- Draftball surface
- Blade lift and centershift cylinder sockets
- Circle and moldboard tip bracket bearings
- Moldboard slide rail
- Bolt-in segment and circle teeth

Protection systems. To relieve high-impact loads, Caterpillar provides two protection systems as standard equipment:

- **Blade lift accumulators** absorb vertical shocks when the moldboard contacts immovable objects. This system is especially useful in rough grading and rocky areas. It provides precise control while allowing relief from vertical impact loads.
- **Circle drive slip clutches** protect the drawbar, circle and moldboard from horizontal shocks when an object is hit near the toe or heel of the blade. This system is most useful in applications where hidden objects are frequently encountered.

Operator's Station

Caterpillar sets the standard for comfort, convenience and visibility.

Exceptional viewing area helps improve operator confidence and productivity in all grader applications. The one-piece front windshield provides an unobstructed view of the work area. The large side windows offer a clear view of the moldboard heel and tandem tires. A wide rear window provides good visibility to the rear of the machine.

Quiet cab. The operator sound pressure level measured according to the procedures specified in SAE J919 JUN86 is 75 dB(A), for the cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed. The quiet environment keeps the operator alert and focused.

Low efforts on all pedals, hydraulic controls and the transmission shifter reduce operator strain and fatigue.

Roomy interior. Extra leg and foot room create a spacious, open cab. The cab includes built-in storage space for personal items such as a lunch box, cooler and coat.

Contour series suspension seat is standard equipment and features fold-up armrests and a retractable seat belt. The seat follows the contours of your body and can be easily adjusted for optimal support and comfort. Seat controls are located in front and to the left of the operator, in plain view.

Standard air conditioner and heater arrangements create a comfortable work environment for the operator. Both arrangements use high-capacity systems to ensure the operator stays productive — even in bitter cold or high heat and humidity. They dehumidify the air as well as pressurize the cab, which keeps the air fresh and seals out dust. The adjustable air vents evenly distribute air throughout the cab, keeping the operator comfortable and the windows clear of fog or frost.

Electronic Monitoring System checks important machine systems and provides the operator with three levels of warnings. For additional information see page 15.

Comfort and convenience are designed into every feature:

- Engine start-stop switch enables the operator to start and stop engine with a simple key turn.
- The fuel level, torque converter oil temperature, engine coolant temperature and articulation angle gauges are located inside the cab, directly in front of the operator. The tachometer with digital speed readout is also in front of the operator.
- Controls and switches are located on the steering console, shift console and right cab post — all within easy reach.
- Rocker switches and transmission shifter are backlit for nighttime operation.
- The operator can independently adjust controls and steering wheel angle.
- Cab floor is flush with the bottom of the doors, making it easy to sweep and keep clean.
- Cab door releases from both inside and outside of cab.

Serviceability

Conveniently placed service points make routine maintenance quick and easy.

Easy access to service areas speeds up maintenance and ensures that routine service is performed on time:

- Large removable hinged doors are standard and provide easy access to the engine and radiator service points. Spin-on oil filters can be changed quickly.
- Optional auto-lube or clustered lube points.
- Fuse panel is located inside the cab. Its cover clearly identifies circuits and fuse sizes.
- Tandem oil check point is conveniently located between the wheels in the center of the tandem.
- Service meter is incorporated as standard readout on Electronic Monitoring System (EMS II).
- Wiggins fast fill is standard for fuel, tandem oil and engine oil.
- Oil sampling capability for engine, hydraulic, tandem and power train oil is standard.

Power train components feature a modular design so you can remove the engine, transmission or final drives independently for quicker servicing.

Diagnostic capability. A diagnostic tool connection plug allows the starting-charging system to be checked quickly and easily.

Cat's XT hose. Caterpillar designs and manufactures its own heavy-duty XT hose and installs it in all high-pressure circuits. Its resistance to abrasions, coupled with its exceptional strength and flexibility, helps minimize maintenance and extend life.

O-ring face seals create a reliable seal and are used in all hydraulic circuits to minimize the possibility of oil leaks.

Separate wiring harnesses connect all electrical components. This modular harness design provides simple disconnects for major machine repairs or rebuilds. The wires are also color-coded and numbered to speed up diagnosis and repairs. Sure-Seal connectors are made of weather-resistant materials that protect against moisture, corrosion and abrasion.

Environmentally Responsible Design

Caterpillar builds machines that minimize environmental impact.

H-Series motor graders respond to important environmental problems such as noise and air pollution. Today's machines run smoother, quieter and cleaner than ever before.

Quiet cab. The operator sound pressure level measured according to the procedures specified in SAE J919 JUN86 is 75 dB(A), for the cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed. High-contact ratio gears in the transmission and slower engine speeds transmit less noise and vibration to the operator.

Quiet machine. The exterior sound pressure level for the standard machine measured at a distance of 15 meters according to the test procedures specified in SAE J88 JUN86, mid-gear-moving operation, is 79 dB(A). This quiet operation enables the machine to work with minimal disturbance to the surrounding environment.

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

Ozone protection. R134a refrigerant is used in the air conditioning unit to address environmental concerns.

Complete Customer Support

Cat dealer services help you operate longer with lower costs.

Your Cat dealer offers a wide range of services that can be set up under a customer support agreement when you purchase your equipment. The dealer will help you choose a plan that can cover everything from machine and attachment selection to replacement — to help you get the best return on your investment.

Selection. Make detailed comparisons of the machines you are considering before you buy. What are the job requirements? What production is needed? What is the true cost of lost production? Your Cat dealer can give you precise answers to these questions.

Purchase. Look past initial price. Consider the financing options available as well as day-to-day operating costs. This is also the time to 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.

Operation. Improving operating techniques can boost your profits. Your Cat dealer has training videotapes, literature and other ideas to help you increase productivity.

Maintenance. What is the cost of preventive maintenance? More and more equipment buyers are planning for effective maintenance before buying equipment. Choose from your dealer's wide range of maintenance services at the time you purchase your machine. Repair option programs guarantee the cost of repairs up front. Diagnostic programs such as Scheduled Oil Sampling and Technical Analysis help you avoid unscheduled repairs.

Product support. You will find nearly all parts at our dealer parts counter. In the rare case when we don't have a part in stock, we will get it to you fast — usually within 24 hours. Save money with Cat Remanufactured components. You receive the same warranty and reliability as new products at cost savings of 40 to 70 percent.

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

Engine

Four-stroke cycle, 12-cylinder Caterpillar 3412E turbocharged diesel engine with hydraulically actuated, electronically controlled fuel system (HEUI).

Power ratings*

Ratings at 2000 rpm	kW	hp	PS
Gross power	403	540	—
Net power	373	500	—

The following ratings apply at 2000 rpm when tested under the specified standard conditions for the specified standard:

Net power	kW	hp	PS
EEC 80/1269	373	500	—
ISO 9249	373	500	—
SAE J1349 (JAN90)	369	495	—
ISO 3046-2	373	500	—
DIN 70020	—	—	519

Max. torque (net) @ 1300 rpm		
	2397 Nm	1763 lb-ft
Torque rise		30%

Dimensions

Bore	137.2 mm	5.40 in
Stroke	152.4 mm	6.50 in
Displacement	27.0 liters	1647 cu in

***Power rating conditions**

- based on standard air conditions of 25°C (77°F) and 99 kPA (29.32 in Hg) dry barometer
- used 35° API gravity fuel having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 30°C (86°F) [ref. a fuel density of 838.9 g/L (7.001 lb/U.S. gal)]
- net power advertised is the power available at the flywheel when engine is equipped with fan, air cleaner, muffler and alternator
- no derating required up to 3050 m (10,000 ft) altitude

Features

- HEUI fuel system
- 3-ring aluminum alloy pistons
- heat resistant, stellite-faced valves
- forged steel connecting rods
- one-piece cylinder head with six hold-down bolts per cylinder
- cast cylinder block with replaceable wet liners
- induction-hardened, forged crankshaft
- direct electric 24-volt starting and charging system
- two 12-volt, 190 amp-hour, 1300 CCA, maintenance-free batteries
- 100-amp alternator
- tube-type, water-cooled oil cooler
- Advanced Modular Cooling System (AMOCS) radiator
- dry-type, radial-seal air cleaner with primary and secondary elements
- optional engine prelube

Transmission

Caterpillar power shift transmission with electronic shifting.

Maximum travel speeds (at rated rpm with 29.5-29 tires)

		km/h	MPH
Forward	1	3.2	2.0
	2	4.9	3.1
	3	8.5	5.3
	4	13.1	8.1
	5	24.3	15.1
	6	37.7	23.4
Reverse	1	4.7	2.9
	2	12.6	7.8
	3	36.1	22.4

Features

- single lever controls direction and gear selection
- transmission lock prevents accidental gear engagement; machine won't start with transmission shift lever in gear
- lockup clutch torque converter for direct drive operation
- gear-type pump

Brakes

Meets the following standards: SAE J1473 OCT 90 and ISO 3450-1985.

Service brake features

- oil applied, multiple spring released oil-disc brakes located in each of the four wheel spindle housings
- sealed and adjustment free
- lubricated and cooled by tandem housing oil
- 101 478 cm^2 (15,733 in^2) of total braking surface
- four brakes, 12 discs each
- oil-over-oil system
- in the event of a failed engine, an electric pump is available to retract the brakes and allow the machine to be towed for service

Parking brake features

- multiple oil-disc unit
- engaged parking brake neutralizes transmission
- spring-applied, oil-released
- incorporated as part of the service brakes
- in the event of a failed engine, an electric pump is available to retract the brakes and allow the machine to be towed for service

Secondary brake features

- separate circuits to right and left tandems
- malfunction of one circuit still leaves machine with at least half of original braking capacities
- dual hydraulic accumulators provide oil to actuate brakes five times after engine stops
- in the event of total braking loss, the spring-actuated parking/emergency brake can be used to lock the wheels on any surface

Hydraulic System

Proportional priority pressure compensated system.

Output at 2000 rpm and 24 150 kPa (3500 psi)	508 liters/min	134 gpm
Standby pressure	3100 kPa	450 psi
Maximum system pressure	24 150 kPa	3500 psi

Pump features

- two load sensing, pressure compensating, variable-displacement axial piston pumps
- low standby pressure
- pump supplies only flow and pressure required to move equipment plus 2100 kPa (300 psi) margin pressure

Control features

- nine closed-center control valves standard:
  - — right blade lift
  - — left blade lift
  - — blade sideshift
  - — blade tip
  - — circle drive
  - — centershift
  - — front wheel lean
  - — articulation
  - — ripper
- low effort, short throw controls
- controls spaced to allow use of several controls at once
- lock valves built into all control valves
- line relief valves for the blade lift, blade tip and blade sideshift circuits are incorporated into the control valves
- if flow requirements exceed pump output, control valves proportion flow to each equipment circuit

Other features

- steering circuit given priority over equipment circuits
- heavy duty XT hose
- hose couplings with O-ring face seals
- full-flow filter

Moldboard

Fabricated from wear-resistant, high-carbon steel.

Dimensions				
Moldboard length			7.3 m	24'
Moldboard				
Height			1067 mm	42"
Thickness			50 mm	2"
Cutting Edge Options				
	Width		Thickness	
	330 mm	13"	28.5 mm	1.1"
	330 mm	13"	45 mm	1.8"
	330 mm	13"	60 mm	2.4"
	406 mm	16"	28.5 mm	1.1"
Endbit Options				
Width			203.2 mm	8"
Thickness			25.4 mm	1"

Features

- heat-treated sideshift rails
- bronze-alloy wear inserts
- cutting edge and endbit are Caterpillar through-hardened, cut DH-2 steel
- 25 mm (1") diameter bolts
- blade lift accumulators protect circle, drawbar and moldboard from vertical shocks

Circle

Single-piece, rolled ring forging.

Dimensions		
Circle	mm	in
Circle diameter	2562	101
Blade beam thickness	60	2.36
Blade rotation (min)		±60°

Features

- teeth surfaces all hardened
- raised wear surfaces on bottom
- two hydraulically driven circle drive motors
- 360° circle rotation
- circle drive slip clutches protect circle, drawbar and moldboard when objects hit near toe or heel of moldboard
- 90 uniformly spaced, flame-cut tooth spaces
- six identical, individually serviced bolt-on tooth segments

Blade Range

Full range of blade positioning.

		mm	in
Circle centershift*	Right	5338	210.2
	Left	5332	209.9
Moldboard sideshift**	Right	4902	193.0
	Left	4528	178.3
Maximum shoulder reach outside of tires	Right	3229	127.1
	Left	3222	126.9
Maximum lift above ground		634	25.0
Maximum depth of cut		657	25.9
Blade tip range			40° forward

* Centershift including maximum moldboard sideshift

** Sideshift measured from a point where the moldboard is centered with respect to the circle

Drawbar

Box-section, A-frame design.

Dimensions		
Drawbar frame	mm	in
Height	215	8.5
Thickness	16	0.6
Width	195	7.7
Base plate thickness	60	2.4

Features

- yoke plate completely covers top of circle
- all shoes have vertical and horizontal adjustment
- 10 replaceable bronze-alloy wear strips between circle and drawbar
- eight replaceable bronze-alloy wear strips between the circle and the eight shoes

Cab with ROPS/FOPS

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

Cab features

- The operator sound pressure level measured according to the procedures specified in SAE J919 JUN86 is 75 dB(A), for the cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed
- low profile, sound-suppressed cab is standard
- engine key start/shutoff switch
- back-lit rocker switches
- adjustable control console
- tilt adjustable steering wheel
- cloth covered contour series suspension seat with multiple adjustments
- fuse panel in steering control console
- 24-volt to 12-volt 15-amp converter ready
- heater/air conditioner systems with adjustable vents and three-speed fan
- bright two-tone gray interior
- gauges located in the cab
  - — fuel level
  - — torque converter oil temperature
  - — engine coolant temperature
  - — articulation angle
  - — tachometer with digital speed readout
  - — service hour meter/ripper position (incorporated within EMS II)
- EMS II monitoring system
- front windshield washer and wiper
- 10° slanted rear window
- low effort, floor mounted foot pedals
- sweep-out cab floor
- exterior door release
- lunch box location
- coat hook
- location and wiring for two-way or entertainment radio

NOTE:
Properly installed and maintained Caterpillar cab tested with doors and windows closed according to ANSI/SAE J1166 MAY90, meets OSHA and MSHA requirements for operator sound exposure limits in effect at time of manufacture.

ROPS/FOPS features

- ROPS (Rollover Protective Structure) meets the following criteria:
  - — SAE J396
  - — SAE J1040 JUN88
  - — ISO 3471-1986
- also meets the following FOPS (Falling Object Protective Structure) criteria:
  - — SAE J231 JAN81
  - — ISO 3449-1984
- seat belt, retractable meets the following criteria:
  - — SAE J386 JUN93
  - — ISO 6683-1981

Warning indicator operation of Electronic Monitoring System (EMS II)

- **Category I** — Alert indicator flashes. System needs attention soon, no immediate action required.
- **Category II** — Alert indicator and action lamp flash, change of machine operation or system maintenance necessary to prevent severe component damage.
- **Category III** — Alert indicator and action lamp flash and action alarm sounds. Immediate safe engine shutdown required to prevent severe component damage and/or operator injury.

Frame

Features

- front frame is a flanged, box section with single piece top and bottom plates that run from bolster to articulation joint
- rear frame is constructed of solid plate side rails; hitch plates are gussetted for strength and durability

Service Refill Capacities

	L	Gallons
Fuel tank	1207	319
Radiator	142	38
Crankcase	68	18
Transmission	38	10
Differential and final drives	184	49
Tandem housing (each housing)	322	85
Hydraulic tank	128	34
Circle drive housing (each housing)	8	2

Tandems

Dimensions

	mm	in
Height, max	1040	41
Width	353	14
Sidewall thickness	25	1
Drive chain pitch	76.20	3
Wheel axle spacing	2285	90
Tandem oscillation	20° Forward 20° Reverse	

Front Axle

Live spindle design.

Dimensions

Front axle		
Ground clearance	817 mm	32.2"
Front wheel lean		±18°
Oscillation angle		32°

Features

- allows use of large outboard bearings for high load-carrying capability of the wheel assembly
- wheel spindle rotates inside sealed compartment
- bearings bathed in oil

Steering

Two-cylinder, hydraulic steering with hand metering unit.

Dimensions

Minimum turning radius wide tires (outside front tires)*	12 m	39'11"
Steering range	50° left/right	
Articulation angle	25° left/right	

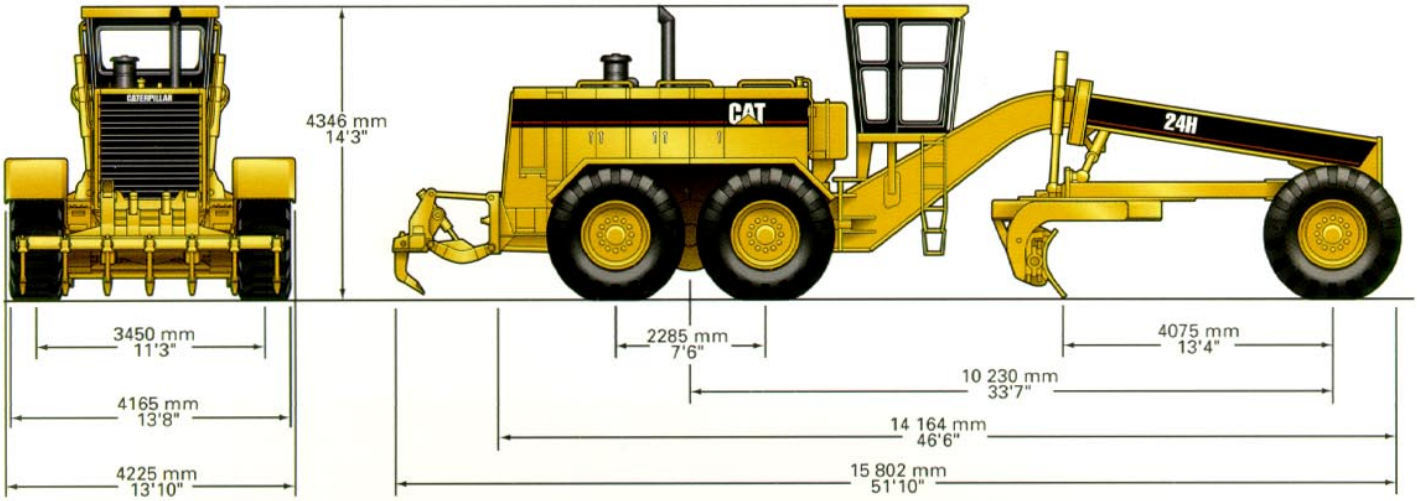
*Using front wheel steering, frame articulation, and with differential unlocked.

Features

- consistent steering response to the left and right
- secondary steering system provides emergency steering capability in event of a complete loss of hydraulic pressure
- large steer stops (located at the wheels) and cross over relief valve help prevent damage when an object is hit

Dimensions

All dimensions are approximate.



Operating weights (approximate)

on front wheels	18 400 kg	40,573 lb
on rear wheels	43 554 kg	96,038 lb
total machine	61 955 kg	136,611 lb

Operating weights based on standard machine configuration with 29.5-29 tires, full fuel tank, coolant, lubricants and operator.

Standard Equipment

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

Electrical
- Alarm, back up
- Alternator, 100-amp, sealed
- Batteries, two maintenance-free, 1300 CCA
- Electrical system, 24-volt
- Horn, electric
- Lights, stop, tail, turn signals and hazard warning
- Starting motor, heavy duty
- Starting receptacle, plug-in
- Wiring, switch, for roof-mount beacon
- Wiring for communications radio

Operator Environment
- Accelerator
- Air conditioner, heater, pressurizer
- Coat hook
- Control console, adjustable
- Directional signals
- Dome light
- EMS II monitoring system
- Fan, front
- Gauges inside the cab:
  - articulation
  - engine coolant temperature
  - fuel level
  - tachometer w/digital speed readout
  - torque converter oil temperature
- Hydraulic controls:
  - articulation
  - blade lift, right and left
  - blade sideshift
  - blade tip
  - centershift
  - circle drive
  - front wheel lean
  - ripper
- Mirrors, rearview (exterior and interior)
- Power steering, hydraulic
- Radio ready (entertainment), includes mount, speakers, antenna, and 15-amp, 24-volt to 12-volt converter
- Ripper position indicator (EMS II)
- ROPS cab, sound suppressed, 75 dB(A), low profile
- Safety glass, tinted
- Seat, cloth covered, contour series suspension
- Seat belt, retractable, 76 mm (3")
- Service hour meter (EMS II)
- Steering wheel, tilt adjustable
- Storage area for cooler/lunch box
- Sun screen
- Windshield washer and wipers, front/rear

Power Train
- Air cleaner, dry type, radial seal with service indicator and automatic dust ejector
- Anti-freeze to –50°C (–58°F)
- Blower fan
- Brakes, oil disc, four-wheel, oil actuated
- Differential, lock-unlock switch
- Engine, diesel, 3412E HEUI
- Fast fill fuel system (Wiggins)
- Ground level engine shutdown
- Muffler, under hood
- Oil change system, high speed (Wiggins)
- Parking brake, multi-disc, sealed and oil-cooled
- Prescreener
- Priming pump, fuel
- Radiator (AMOCS)
- Secondary steering
- Speed control
- Tandem drive
- Transmission, six-speed forward and three-speed reverse power shift with lockup clutch torque converter
- Transmission neutralizer

Other Standard Equipment
- Blade lift accumulators
- Bumper, rear, with hitch
- Cap locks for hydraulic tank, radiator access cover and fuel tank
- Circle drive slip clutches, two
- Clustered lube lines or automatic lubrication
- Cutting edges, DH-2 Steel, choice of:
  - 330 mm x 28 mm (13" x 1.1")
  - 330 mm x 45 mm (13" x 1.8")
  - 330 mm x 60 mm (13" x 2.4")
  - 406 mm x 45 mm (16" x 1.8")
- Diagnostic connector
- Doors, engine compartment, locking
- End bits, 25 mm (1") DH-2 steel
- Frame, articulated, with safety lock
- Fuel tank, 1207 l (319 gallon)
- Hydraulic oil level sight gauge
- Moldboard, 7315 mm x 1067 mm x 51 mm (24' x 42" x 2")
- Oil sampling capability (engine, hydraulics, transmission, tandems)
- Operator-controlled brake retract pump
- Rims, 736 mm x 635 mm (29" x 25")
- Ripper, 7-shanks (3 shanks/tips provided)
- Starting aid, ether
- Tool box with padlock
- Towing hitch, rear

Optional Equipment

With approximate change in operating weight.

	kg	lb
Minimum runable machine weight:		
Equipped with no customer specified attachments and the minimum weight required options	57 468	126,717
Attachments:		
24-foot blade with:		
Standard cutting edges 330.2 mm x 27.9 mm (13" x 1.1")	538	1187
Heavy duty cutting edges 330.2 mm x 45.7 mm (13" x 1.8")	712	1571
Heavy duty cutting edges 406 mm x 45.7 mm (16" x 1.8")	877	1934
Cold weather starting arrangement:		
Includes 240-volt heaters for hydraulic oil, engine oil and jacket water as well as fuel heater group	57	126
Fan, variable pitch	0	0
Fenders, rear	407	897
Lights, auxiliary blade, working	6	14
Low temperature starting arrangement:		
Includes two additional batteries and an additional starting motor	122	269
Push plate	269	592
Ripper tooth group:		
Straight shank and penetration tips (up to a maximum of four)	65 each	143 each
Wheel and tire arrangement:		
29.5R29 Radial	7054	15,535
29.5 - R29 XLDD 2A	4979	10,968
29.5 - R29 XHA	3667	8,076
Maximum machine weight:		
Equipped with all available customer specified attachments and the heaviest required options	61 955	136,611

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Replaces AEHQ5164

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