

# 140H Motor Grader



## ES Version

Cat® 3306 turbocharged diesel engine with  
Engine Power Management

Gears 4 - 8	138 kW	185 hp
Gears 1 - 3	123 kW	165 hp

Blade width	3658 mm	12 ft
Operating weights (approximate)		
On Front wheels	4223 kg	9310 lb
On Rear wheels	10 501 kg	23,150 lb
Total machine	14 724 kg	32,460 lb

# Caterpillar® 140H Motor Grader

The 140H blends productivity and durability to give you the best return on your investment.

## Power Train

The field-proven 3306 engine offers exceptional lugging performance and fuel efficiency. The power shift transmission features smooth, on-the-go shifting and electronic overspeed protection. To increase productivity, the direct drive transmission has eight forward speeds and six reverse speeds.

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## Hydraulics

The load-sensing hydraulic system lowers power consumption and system heat. The control valves provide low lever effort, balanced flow and consistent implement control. Blade float is incorporated into the blade lift valves.

**pg. 6**

## Drawbar, Circle & Moldboard

The blade linkage design maximizes moldboard positioning. A long wheel base allows the operator to obtain a more aggressive moldboard angle for better material movement. The rugged construction of the drawbar, circle and moldboard, and use of replaceable wear inserts provide durability and minimize maintenance costs.

**pg. 7**

## Operator's Station

Well-positioned blade linkage, a tapered engine hood and 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 more productive work environment.

**pg. 8-9**

## Serviceability

All service areas are easily accessible. A modular design permits easy removal of power train components for servicing. Diagnostic capability allows fast servicing of the transmission.

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## Environmentally Responsible Design

Engine arrangements are designed to reduce emissions and meet current regulations of the European Union.

**pg. 11**

### **Matched and balanced components.**

*The Cat 3306 engine, direct-drive power shift transmission and load-sensing hydraulics are designed to work together to deliver top productivity in all applications.*

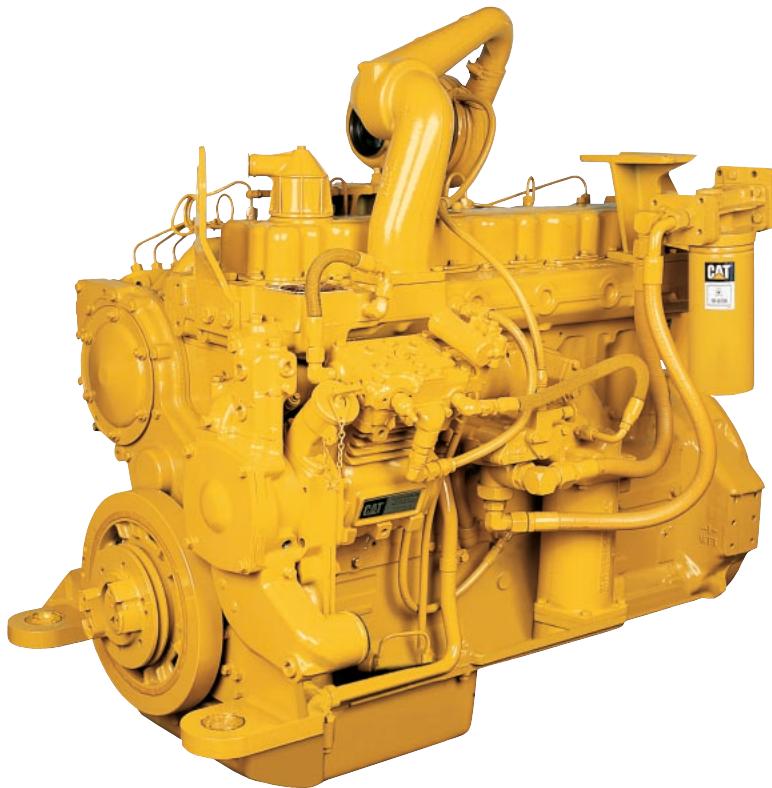
### **Superior visibility, control layout and operating ease.**

*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.*



## Power Train

*Matched Caterpillar components deliver smooth, responsive performance and reliability.*



**Cat 3306 engine** continues its tradition of powerful, efficient performance and unmatched reliability and durability. The six-cylinder engine is turbocharged with a high displacement-to-power ratio. This large displacement produces better lugging capability, lower internal stresses and extended component life.

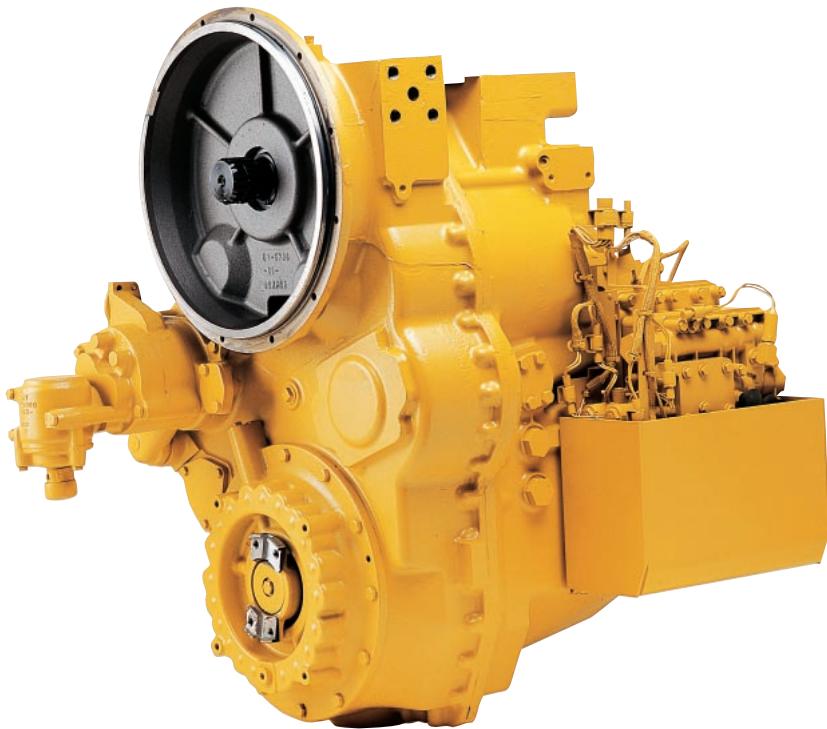
**Superior lugging performance.** High torque output and high torque rise make the 3306 engine very responsive. The engine's lugging capability allows it to pull through sudden, short-term increases in loads, reducing the need to downshift. As a result, the operator can maintain desirable working speeds, which means the work gets done faster.

**Fuel efficiency.** High fuel injection pressures ensure proper mixing of fuel and air. This high injection pressure, coupled with the precise metering and timing of the fuel injection, results in superior fuel efficiency and reduced emissions. High compression ratios ensure dependable cold-starting performance and low emissions.

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

**Engine Power Management** delivers a full-rated net power of 138 kW (185 hp) in gears 4 - 8 forward. In lower gears, where the machine is traction-limited, engine horsepower is automatically reduced to 123 kW (165 hp). Engine Power Management works to lower fuel consumption as well as reduce tire slippage and wear in the lower gears.

**Electronic overspeed protection** helps prevent engine and transmission damage from premature downshifting and grade-induced overspeeding.



**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.

**Direct drive** delivers superior fuel efficiency and better “feel” of blade loads, material hardness and ground speed.

**Gear selections.** Eight forward speeds and six reverse speeds give the operator a wide operating range. With four gear selections below 9.7 km/h (6 mph), the operator can precisely match working speeds to job conditions for maximum productivity in earthmoving applications. Gears five, six and seven provide the optimal speed range for efficient snow removal operations.

**Electronic transmission control** produces easy, smooth shifts, which enable the operator to maintain uniform surfaces if shifting is required. Smooth shifts also extend the life of the transmission by placing less stress on transmission clutches. A single lever controls direction, speed and the parking brake.

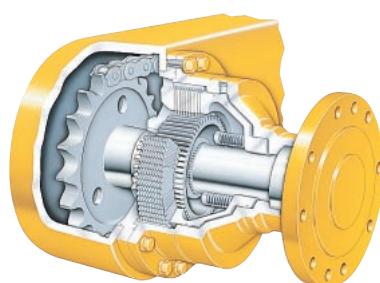
**Inching capability.** Low pedal effort and excellent modulation provide precise control of machine movements when using the inching pedal. This is especially important in finish grading or other close-quarter work where machine control is critical.

**Optional 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.

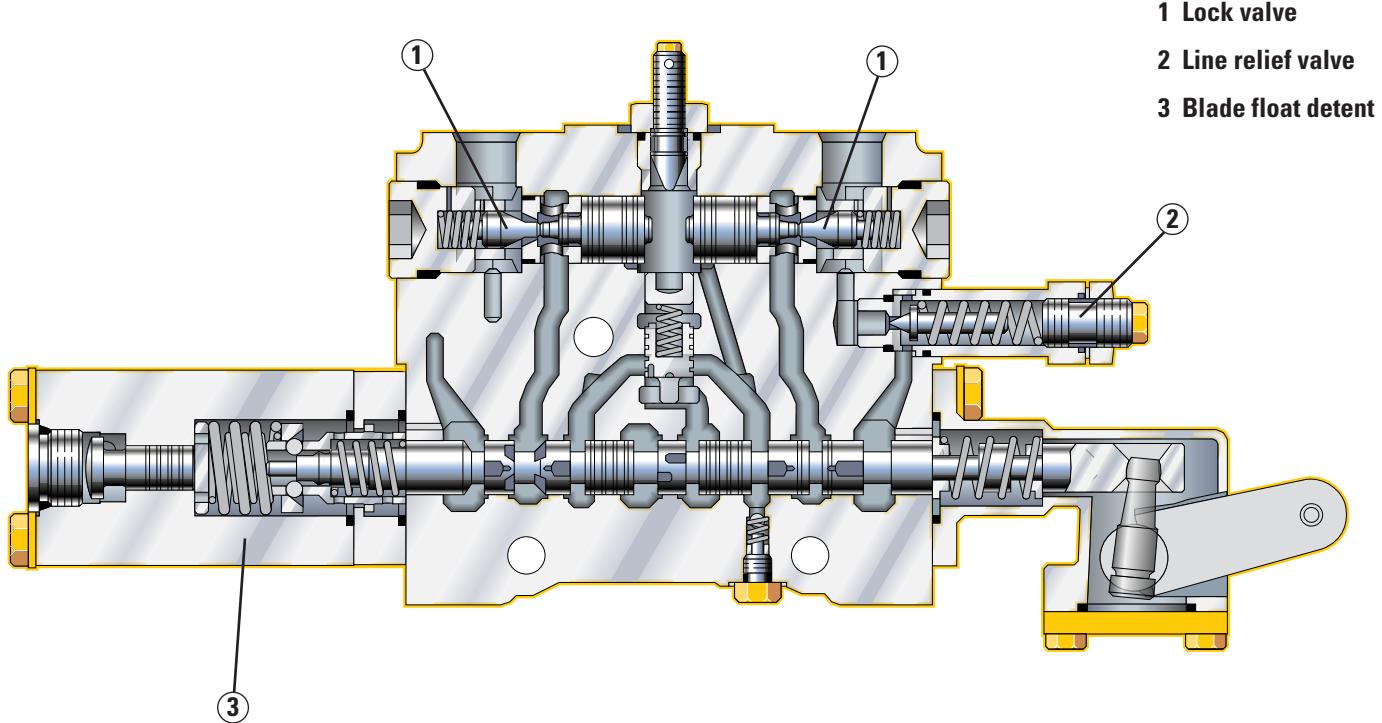
**Dual air system** supplies braking capacity to each side of the machine. This system ensures secondary braking capability in the event a failure occurs in a single brake line. The dual air system also has a large reserve for stalled-engine braking.

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



# 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 power consumption.

**Implement control valves** are designed and built by Caterpillar specifically for motor graders. They provide outstanding operator “feel” and predictable system response for unmatched implement 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 overpressurization.

**Optional hydraulic lockout** mechanically locks all moldboard, machine, and attachment control levers during machine roading. This prevents the machine implements from being accidentally engaged when the motor grader is travelling down the road.

**Low operator effort.** Implement 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. If hydraulic demand exceeds pump capacity, cylinder velocities will be reduced by the same ratio.

**Blade float** is incorporated into the blade lift control valves. Blade float 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.

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

## Drawbar, Circle & Moldboard

*Every component is designed for maximum productivity and durability.*



**Blade positioning.** The blade linkage design provides extensive moldboard positioning. This extended range is most beneficial in mid-range bank sloping and in ditch cutting and cleaning.

**Blade angle.** A long wheel base 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.

**Rugged construction.** The Y-frame drawbar is constructed of two solid beams. A one-piece forged circle is built to stand up to high stress loads.

To resist wear, teeth are induction-hardened in the critical areas. For maximum support, the circle is secured to the drawbar by six support shoes.

**Replaceable wear items.** Tough, durable nylon composite wear inserts are located between the drawbar and circle, and between the support shoes and circle. This wear system helps keep components tight for fine grading and allows easy replacement. In addition to providing extended life, these inserts allow higher circle turning forces by reducing the friction between the circle and drawbar. Replaceable metallic wear inserts are used in the blade lift and centershift cylinder sockets, draftball surface, moldboard slide rail and tip bracket bearings.

**Circle drive slip clutch** protects the drawbar, circle and moldboard from shock when the end of the blade encounters hidden objects. It also reduces the possibility of the grader making abrupt directional changes, further protecting the machine, operator and surroundings.

**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.

## Operator's Station

Caterpillar sets the standard for comfort, convenience and visibility.



**Exceptional visibility** helps improve operator confidence and productivity. The drawbar has been modified to improve the view through the circle, allowing the operator to see the material as it rolls along the moldboard without leaning. 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.

**Quiet cab.** With the doors closed, interior sound level does not exceed 77 dB(A) when tested using ISO 6394 standard. 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. Pedals are angled and raised off the cab floor to make them easy to reach.

**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.

**Standard contour series suspension seat** 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.

**Optional 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 the bitter cold or 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 warning.

**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.
- Gauges are located inside the cab, directly 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 adjust implement controls and steering wheel angle independently.
- Cab floor is flush with the bottom of the doors, making it easy to sweep out and keep clean.
- Fresh air filters are located above each cab door for quick replacement.
- Cab door releases from ground level or inside the cab.
- Ashtray, lighter and cupholder are well-positioned for easy access.
- Optional 12-V power port is available for use with computers, cellular phones or other electronic equipment.



## Serviceability

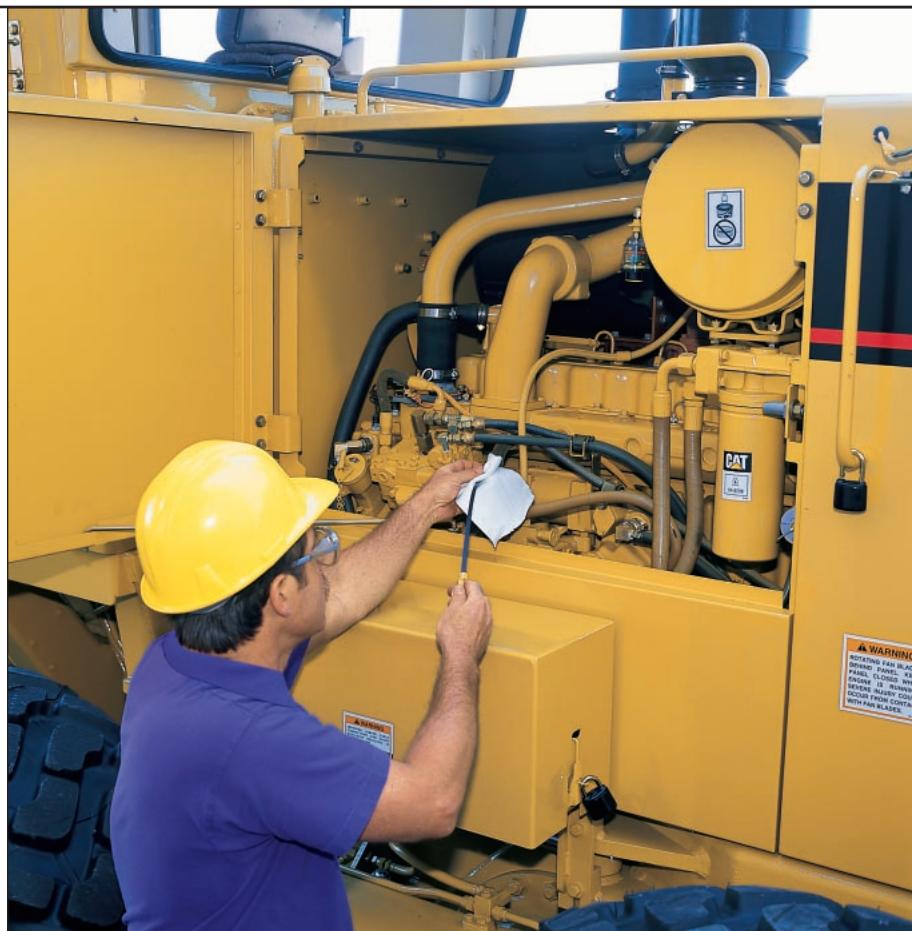
*Conveniently placed service points make routine maintenance quick and easy.*

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

- Large hinged doors provide easy access to the engine and radiator service points.
- Spin-on filters make changes quick and clean.
- Lubrication points for the articulation joint are remote-mounted.
- Disconnect switch and most service points are located on the left side, making them easy to access when a snow wing is mounted on the right side of the machine.
- Fuse panel is located inside the cab. Its cover clearly identifies circuits and fuse sizes.
- Tandem oil checkpoint is conveniently located between the wheels in the center of the tandem.
- Service meter is located on the left side of the steering console, giving the operator a clear view from the ground.
- Sampling ports are provided for drawing engine and hydraulic oil.
- Lockable battery box cover is easily removed without tools.

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

**Diagnostic capability** offers fast servicing of the transmission. The transmission's electronic control module automatically records and saves any system faults for later analysis. S•O•S oil and coolant sampling valves provide a fast, convenient means of obtaining fluid samples and improve analysis reliability.



**XT hose.** Caterpillar designs and manufactures its own heavy-duty XT hose and installs it in all high-pressure circuits. Its resistance to abrasion, coupled with its exceptional strength and flexibility, help 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.

**Radiator cleanout access.** Removable covers on each side of the radiator guard provide access to the front of the radiator for cleanout with compressed air or pressure washer.

**Extended Life Coolant (ELC)** extends coolant life to 6000 hours. A single addition of ELC Extender at 3000 hours is the only maintenance required.

**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 help you create a better world.

The 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 sound-suppressed cab has an interior sound level not exceeding 77 dB(A) when tested using ISO 6394 standards. The resiliently mounted engine and transmission result in less engine noise and vibration to the operator.

**Quiet machine.** On the standard machine, the drive-by exterior sound level will not exceed 110 dB(A) when tested at rated engine speed using ISO 6393 standard test. An optional exterior sound suppression group reduces the exterior sound power level to 105 dB(A). This quiet operation enables the machine to work with minimal disturbance to the surrounding environment.

**Low emissions.** The engine arrangements meet current regulations of the European Union. These engine arrangements reduce the amount of particulates and nitrogen oxides released into the air.

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

**Ozone protection.** To help protect the earth's ozone layer, air-conditioning units use R-134a refrigerant, which does not contain chlorofluorocarbons (CFCs).

## Cat '5-Star Customer Service'

*Your Cat 140H comes with something unique: Cat '5-Star Customer Service' from your Cat dealer.*

### Cat '5-Star Customer Service' means peace of mind from the minute you contact your Cat dealer.

By building a partnership with your Cat dealer, you can focus on your business instead of your equipment. Cat '5-Star Customer Service' brings together all the products, services and people from Caterpillar and the Cat dealer network and puts them firmly behind you. Count on them to help you maintain your competitive edge.

**Cat '5-Star Customer Service' includes Equipment Management Services to help you make a better business decision.** We'll assist you in selecting the right Cat equipment to suit your need, to optimize productivity. And we'll help you make smarter decisions, assist you with machine selection, purchasing or renting options, financing, and projected owning and operating costs.

**Maintenance Services that enable you to maximize machine availability and performance.** Every Cat dealer has a wide choice of maintenance products and services to make sure your equipment achieves maximum performance for the lowest possible cost.

**Predictive Services to anticipate problems.** By anticipating potential problems and preventing unscheduled repairs, Cat Predictive Services make sure that your equipment is always up and ready to run – because maximizing uptime means maximum earning capacity.

**Reconditioning Services for a wider choice of repair alternatives.** Caterpillar factory-reconditioned parts and components get your equipment back on the job in the minimum of time and with lower repair costs, contributing to reduced operating costs and a more efficient operation.

**Off-the shelf availability of genuine Cat parts.** Genuine parts, together with highly experienced, Cat-trained specialists make sure every repair is right first time and your machine is back earning its keep in the shortest possible time.



**"Cat '5-Star Customer Service' is our commitment to combine outstanding equipment and services to give you the most cost effective solutions for your business."**

Caterpillar and Cat dealers

# Engine

Four-stroke cycle, six cylinder Caterpillar 3306 turbocharged diesel engine with Engine Power Management (EPM).

Power ratings for gears 4 - 8 forward and 3 - 6 reverse

Ratings at 1900 rpm*	kW	hp
Gross power	148	199

The following ratings apply at 1900 rpm when tested under the specified standard conditions for the specified standard:

Net power	kW	hp
Caterpillar	138	185
ISO 9249	138	185
SAE J1349	137	183
EEC 80/1269	138	185

Peak torque (net)		
@ 1200 rpm	902 Nm	665 lb-ft
Torque rise		30%

## Dimensions

Bore	121 mm	4.75 in
Stroke	152 mm	6.00 in
Displacement	10.45 liters	638 cu in

Power ratings for gears 1 - 3 forward and 1 - 2 reverse

Ratings at 1900 rpm*	kW	hp
Gross power	133	179

The following ratings apply at 1900 rpm when tested under the specified standard conditions for the specified standard:

Net power	kW	hp
Caterpillar	123	165
ISO 9249	123	165
SAE J1349	122	163
EEC 80/1269	123	165

Peak torque (net)		
@ 1200 rpm	804 Nm	593 lb-ft
Torque rise		30%

## \*Power rating conditions

- 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 2573 m (8442 ft) altitude

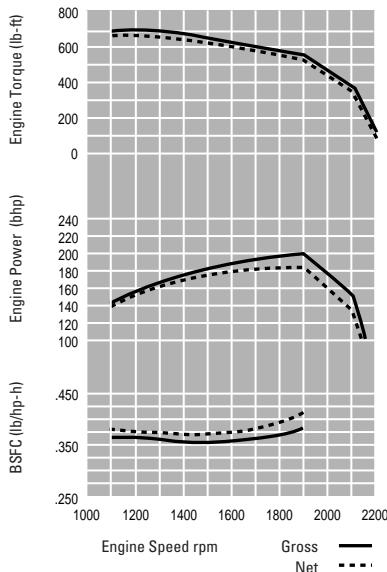
## Engine Power Management (EPM)

- delivers a full-rated net power of 138 kW (185 hp) in gears 4 - 8 forward
- in lower gears, where the machine is traction-limited, engine horsepower is automatically reduced to 123 kW (165 hp)
- works to lower fuel consumption as well as reduce tire slippage and wear in the lower gears

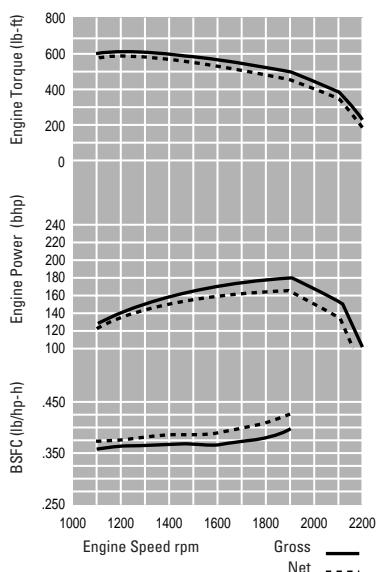
## Features

- direct injection fuel system with individual adjustment-free injection pumps and nozzles
- 3-ring aluminum alloy pistons
- heat-resistant sil-chrome steel intake and stellite-faced exhaust valves
- forged steel connecting rods
- one-piece cylinder head designed with cast intake manifold
- cast cylinder block with replaceable wet liners
- induction-hardened, forged crankshaft
- direct electric 24-V starting and charging system
- two 12-V, 100 amp-hour, 950 CCA, maintenance-free batteries
- 50-amp alternator
- tube-type, water-cooled oil cooler
- vertical-flow, steel-fin, tube-type radiator
- dry-type, radial-seal air cleaner with primary and secondary elements
- resiliently mounted to rear frame

Gears 4 - 8 forward and 3 - 6 reverse



Gears 1 - 3 forward and 1 - 2 reverse



## Hydraulic System

Proportional priority pressure compensated system.

Output at 2100 rpm and 24 150 kPa (3500 psi)	206 liters/min	54.4 gpm
Standby pressure	3100 kPa	450 psi
Maximum system pressure	24 150 kPa	3500 psi

### Pump features

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

### Control features

- eight, closed-center control valves standard:
  - right blade lift
  - left blade lift
  - blade sideshift
  - blade tip
  - circle drive
  - centershift
  - front wheel lean
  - articulation
- low effort, short throw controls
- controls spaced to allow use of several controls at once

- blade float position built into each blade lift control valve
- 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
- dead-engine implement lowering capability
- if flow requirements exceed pump output, control valves proportion flow to each implement circuit

### Other features

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

## Transmission

Direct drive, power shift transmission with eight speeds forward.

### Maximum travel speeds (at rated rpm with conventional base 14.00-24 tires)

		km/h	mph
Forward	1	3.5	2.2
	2	4.8	3.0
	3	7.0	4.3
	4	9.6	6.0
	5	15.1	9.4
	6	20.5	12.8
	7	28.3	17.6
	8	41.1	25.5
Reverse	1	2.8	1.7
	2	5.2	3.2
	3	7.6	4.7
	4	11.9	7.4
	5	22.3	13.9
	6	32.4	20.2

### Features

- electronic shift control
- electronically controlled overspeed protection
- single lever controls direction, speed and parking brake
- low efforts on shift lever and inching pedal
- internal parking brake serviceable without removing transmission
- diagnostic connector
- resiliently mounted to frame

## Service Refill Capacities

	liters	U.S. gallons
Fuel tank	341	90
Cooling system	40	10.4
Crankcase	27	7
Transmission		
differential and final drives	47	12.2
Tandem housing (each)	65	16.9
Hydraulic system	80	20.8
Hydraulic tank	38	9.9
Circle drive housing	7	1.8
Front wheel spindle bearing housing	0.5	0.13

## Steering

Two-cylinder, hydraulic steering with hand metering unit.

### Dimensions

Minimum turning radius (outside front tires)*	7.4 m	24' 3"
Steering range	50° Left/Right	
Articulation angle	20° Left/Right	

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

### Features

- large steer stops and steering relief valve help prevent damage when object is hit during full turn
- consistent steering response to the left and right
- standard secondary steering system provides secondary steering capability in event of a complete loss of hydraulic pressure

## Frame

Flanged, box-section design.

### Dimensions

Front frame	mm	in
Top and bottom plates		
Width	305	12
Thickness	25	1

### Side plates

Width	242	9.5
Thickness	12	0.5

### Linear weights

Front frame	kg/m	lb/ft
Minimum	165	112
Maximum	213	144

### Section modulus

Front frame	cm <sup>3</sup>	in <sup>3</sup>
Minimum	2083	127
Maximum	4785	291

### Features

- single piece top and bottom plates run from bolster to articulation joint
- rear frame has two box-sectioned channels integral with fully welded differential case

## Front Axle

Live spindle design.

### Dimensions

Front axle	Ground clearance	625 mm	24.6"
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

## Tandems

### Dimensions

	mm	in
Height	506	19.9
Width	201	7.9
Sidewall thickness		
Inner	16	0.63
Outer	18	0.71
Drive chain pitch	51	2
Wheel axle spacing	1522	60
Tandem oscillation		
15° Forward		
25° Reverse		

## Brakes

Meets the following standards: SAE J1473 OCT 90 and ISO 3450-1996.

### Service brake features

- air-actuated, oil-disc brakes located in each of the four wheel spindle housings
- sealed and adjustment-free
- lubricated and cooled by tandem housing oil
- 23 948 cm<sup>2</sup> (3712 in<sup>2</sup>) of total braking surface

### Parking brake features

- multiple oil-disc unit
- located in the transmission on the output shaft
- manually actuated
- spring-engaged, air pressure-released
- engaged parking brake neutralizes transmission
- 1916 cm<sup>2</sup> (297 in<sup>2</sup>) of total brake surface area

### Secondary brake features

- separate circuits to right and left tandems
- malfunction of one circuit still leaves machine with at least half of original braking capacity
- dual chamber air tank provides air to actuate brakes five times after engine and compressor stop
- in the event of total braking loss, the spring-actuated parking/emergency brake can be used to lock the wheels on any surface

## Tires and Rims

Tires	Rims	Type
14.00-24	9" x 24"	SP
	10" x 24"	MP

17.5-25	13" x 25"	SP
	14" x 25"	MP

SP = Single-Piece Rim

MP = Multi-Piece Rim

Notes: A wide selection of bias and radial type tires are available through Caterpillar in different sizes, strength indexes and industry types.

Depending on the weight of additional equipment, the machine load may exceed certain tire capabilities. Caterpillar recommends that you carefully evaluate all conditions before selecting a tire model.

## Drawbar

Solid steel bars fabricated into Y-frame design.

### Dimensions

Drawbar frame	mm	in
Height	127	5
Thickness	76	3

### Features

- yoke plate completely covers top of circle
- six shoes support circle
- all shoes have vertical and horizontal adjustment
- 11 replaceable nylon composite wear strips between circle and drawbar
- six replaceable nylon composite wear strips between the circle and support shoes

## Circle

Single-piece, rolled ring forging.

### Dimensions

Circle	mm	in
Circle diameter	1530	60.2
Blade beam thickness	30	1.2

### Features

- 64 uniformly spaced, flame-cut teeth
- teeth surfaces hardened on front 240° of circle
- raised wear surfaces, top and bottom
- hydraulically driven, circle drive motor
- 360° circle rotation

## Moldboard

Fabricated from wear-resistant, high-carbon steel.

### Dimensions

Moldboard	mm	in
Length	3658	144
Height	610	24
Thickness	22	0.87
Arc radius	413	16.25
Throat clearance	120	4.7

Cutting edge	mm	in
Width	152	6

Thickness	mm	in
16	0.63	

End bit	mm	in
Width	152	6

Thickness	mm	in
16	0.63	

### Features

- heat-treated sideshift rails
- replaceable metallic wear inserts
- cutting edge and end bit are Caterpillar through-hardened, curved DH-2 steel
- 16 mm (.63") diameter bolts
- three sideshift mounting locations for optional 4267 mm (14') moldboard

## Blade Range

Full range of blade positioning.

		mm	in
Circle centershift	Right	728	28.7
	Left	695	27.4
Moldboard sideshift	Right	660	26.0
	Left	524	20.6
Maximum shoulder reach outside of tires	Right	1978	77.9
	Left	1896	74.6
Maximum lift above ground		480	18.9
Maximum depth of cut		715	28.1
Maximum blade position angle		90° Both Sides	
Blade tip range		40° Forward	
		5° Backward	

### Features

- steep ditch-cutting angles possible
- 1.5:1 and 2:1 backsloping can be done without putting front tire on slope
- aggressive blade-carrying angles possible

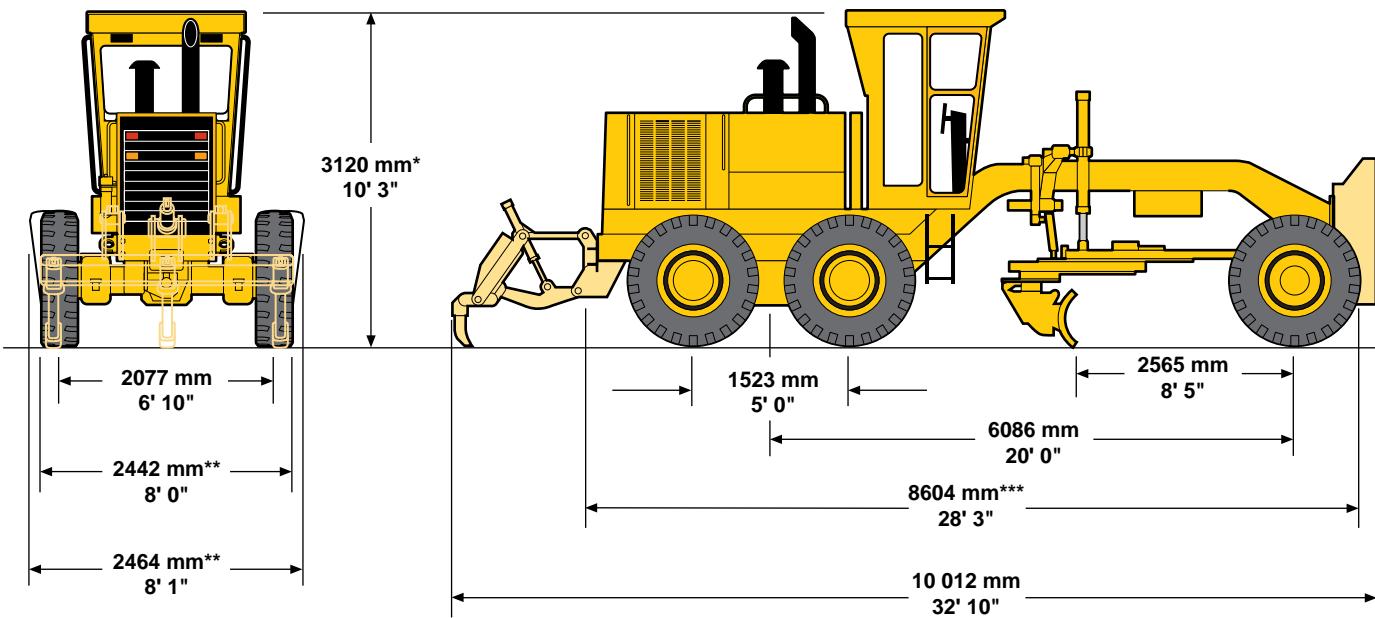
### Notes:

Add 305 mm (12") for maximum right or left moldboard sideshift when using optional 4267 mm (14') blade.

With the machine in the crab position, add 940 mm (37") to maximum right or left moldboard sideshift.

## Dimensions

All dimensions are approximate.



### Operating weights (approximate)

on front wheels	4223 kg	9310 lb
on rear wheels	10 501 kg	23,150 lb
total machine	14 724 kg	32,460 lb

Dimensions and operating weights based on standard machine configuration with 14.00-24 10PR (G-2) tires, full fuel tank, coolant, lubricants and operator.

\* add 225 mm (8.9") for optional full height cab

\*\* add 253 mm (10.0") for optional 17.5-25 tires

\*\*\* add 201 mm (7.9") for front push plate  
add 1207 mm (4') for rear-mounted ripper-scarifier

Note: Height without ROPS, exhaust, seat back, or other easily removed encumbrances 3.05 m (10'0")

## Scarifiers and Ripper-Scarifier

Type	V-Type Scarifier (mid-mounted)		Ripper-Scarifier (rear-mounted)	
Working width	1184 mm	46.6"	2300 mm	91"
Scarifying depth, maximum	292 mm	11.5"	411 mm	16.2"
Scarifier shank holders:				
number		11		9
spacing	116 mm	4.6"	267 mm	10.5"
Ripping depth, maximum	—	—	462 mm	18.2"
Ripper shank holders:				
numbers	—	—	—	5
spacing	—	—	533 mm	21"
Increase in machine length, beam raised	—	—	970 mm	38.2"
Penetration force*	—	—	8047 kg	17,740 lb
Pryout force	—	—	9281 kg	20,460 lb

\*Varies with machine configuration.

## Cab with ROPS/FOPS

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

### Cab features

- 77 dB(A) operator sound pressure level when measured per ISO 6394 at rated speed
- low profile, sound-suppressed cab is standard
- optional full height, sound-suppressed cab
- engine key start/shutoff switch
- back-lit rocker switches
- adjustable control console
- tilt adjustable steering wheel
- cloth-covered contour suspension seat with multiple adjustments
- retractable seat belt
- fuse panel in steering control console
- optional 24-V to 12-V 25-amp converter
- optional heater/air conditioner systems with adjustable vents and three-speed fan
- optional defroster fans
- gauges located in the cab
  - fuel
  - brake air pressure, two
  - engine coolant temperature
  - articulation
  - voltmeter
  - optional speedometer/tachometer
- service hour meter on steering console
- EMS operator warning system
- wipers and washers, windshield and lower front windows
- optional rear wiper and washer

- optional rear window sunshade
- fixed lower front windows
- optional opening lower front windows
- optional sliding side windows
- 10° slanted rear window
- low effort, suspended foot pedals
- sweep-out cab floor
- ground-level door release
- lunch box location
- cupholder
- ashtray and 24-V lighter
- optional 12-V power port
- coat hanger
- location and wiring for two-way or entertainment radio

#### Note:

When properly installed and maintained, the Caterpillar cab, when 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.

### Functions analyzed by Electronic Monitoring System (EMS)

- **Category I** — Flashing indicator for alternator problem and parking brake engagement.
- **Category II** — Flashing action lamp and indicator for engine coolant and hydraulic oil heating problem and transmission electrical problem. Requires change in machine operation.
- **Category III** — Loud action alarm, plus flashing action lamp and indicator to signal problem with engine oil pressure, brake air pressure, supplemental steering, also parking brake applied with transmission engaged. Requires immediate machine shutdown.

### ROPS/FOPS features

- ROPS (Rollover Protective Structure) meets the following criteria:
  - SAE J396
  - SAE J1040 MAY94
  - ISO 3471-1994
- also meets the following FOPS (Falling Object Protective Structure) criteria:
  - SAE J231 JAN81
  - ISO 3449-1992

# Standard Equipment

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

## Electrical

- Alternator, 50-amp, sealed
- Batteries, two maintenance-free, 950 CCA
- Battery box cover, lockable
- Electrical system, 24-V
- Lighting system
  - two bar mounted, high/low beam halogen headlights with integral turn signals
  - radiator grill-mounted stop lights with integral tail lights
  - radiator grill-mounted turn signal lights
  - radiator grill-mounted connector for customer installed lighting
- Motor, starting
- Receptacle, trouble light

## Operator Environment

- Accelerator-decelerator
- Ashtray and lighter
- Coat hook
- Control console, adjustable
- Cupholder
- EMS, operator warning system
- Gauges inside the cab
  - articulation
  - engine coolant temperature
  - fuel
  - voltmeter
  - brake air pressure, two
- Hydraulic controls, load-sensing
  - articulation
  - blade lift, right and left with float position
  - blade sideshift
  - blade tip
  - centershift
  - circle drive
  - front wheel lean

- Mirror, wide angle, inside rearview
- Power steering, hydraulic
- ROPS cab, sound-suppressed, 77 dB(A), low profile
- Seat, cloth-covered, contour suspension
- Seat belt, retractable, 76 mm (3")
- Service hour meter
- Steering wheel, tilt adjustable
- Storage area, cooler/lunch box
- Throttle, hand
- Windows, fixed lower front
- Wipers and washers, windshield and lower front windows

## Power Train

- Air cleaner, dry type, radial seal with service indicator
- Blower fan
- Brakes, oil-disc, four-wheel, air actuated
- Differential, lock-unlock
- Engine, 3306 DIT diesel, low emissions with Engine Power Management
- Muffler, under hood
- Parking brake, multi-disc, sealed and oil-cooled
- Precleaner, automatic dust ejector
- Prescreener
- Priming pump, fuel
- Tandem drive

- Transmission, 8-speed forward and 6-speed reverse power shift, direct drive with electronic shift control and overspeed protection

## Other Standard Equipment

- Bumper, rear, with hitch
- Cap locks for hydraulic tank, radiator access cover and fuel tank, with locks
- Circle drive slip clutch
- Cutting edges, 152 mm x 16 mm (6" x 5/8") curved DH-2 steel
- Doors, engine compartment, with locks
- Drawbar, six shoe with replaceable nylon composite wear strips
- End bits, 16 mm (5/8") DH-2 steel
- Frame, articulated, with safety lock
- Fuel tank, 341 liter (90 U.S.gallon)
- Horn, air
- Link bar, 7-position
- Moldboard, 3658 mm x 610 mm x 22 mm (12' x 24" x 7/8")
- Rims, refer to Tires and Rims section, page 14
- S•O•S ports, engine and hydraulic Supplemental steering system
- Tires, refer to Tires and Rims section, page 14
- Tool box, with lock

## Optional Equipment

With approximate change in operating weight.

	kg	lb		kg	lb
Accumulators, blade lift	71	156	Fan, defroster, front and rear	2	4
Air conditioner with heater and pressurizer	49	107	Fan, reversible, with rear grill cover	9	20
Air dryer	13	29	Fuel tank, 454 liter (120 U.S. gallon)	36	80
Alarm, back-up	3	7	Graderbit system, penetration bit type	163	360
Alternator, 75-amp	11	25	Guard, transmission	98	215
Alternator, 100-amp	16	35	Heater, engine coolant	1	3
Autoshift, transmission	2	5	Heater, with pressurizer	18	40
Blade, 3658 mm x 688 mm x 25 mm (12' x 27" x 1")	151	340	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		
Blade, 4267 mm x 610 mm x 22 mm (14' x 24" x 7/8")	75	166	Lighting systems:		
Blade, 4267 mm x 688 mm x 25 mm (14' x 27" x 1")	261	574	work lights, front and rear	6	13
Blade, front-mounted 2750 mm x 980 mm	850	1874	snow wing light, right	18	40
Cab, ROPS, high profile, sound suppressed	77	170	warning light, cab mounted	3	6
Converter, 25-amp, 24-V to 12-V	5	11	Mirrors, dual, inside mounted	—	—
Cutting edges for 22 mm (7/8") thick blade			Mirrors, outside mounted	8	18
203 mm x 19 mm (8" x 3/4") for 3.7 m blade			Power port, 12-V	2	5
203 mm x 19 mm (8" x 3/4") for 4.1 m blade			Protection, tire chain	18	39
203 mm x 16 mm (8" x 5/8") for 3.7 m blade			Push plate, front mounted	919	2025
203 mm x 16 mm (8" x 5/8") for 4.1 m blade			Radio ready, entertainment	—	—
Cutting edges for 25 mm (1") thick blade			Rims, refer to Tires and Rims section, page 14		
203 mm x 19 mm (8" x 3/4") for 3.7 m blade			Ripper-scarifier, rear	961	2119
203 mm x 19 mm (8" x 3/4") for 4.1 m blade			Ripper, shank/tooth, one	33	72
Endbits, overlay, reversible,	11	24	Ripper, shanks/teeth, nine	65	144
Ether starting aid	0	1	Scarifier, front mounted, V-type	845	1862
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	23	52	Seat, cloth-covered, contour air suspension	—	—
Extensions, blade 610 mm (2') right and left			Snow arrangements, refer to Snow Arrangement Supplement		
for 22 mm (7/8") thick blade	114	250	Speedometer/tachometer	0	1
for 25 mm (1") thick blade	148	325	Sunshade, rear window	3	7
Tires, refer to Tires and Rims section, page 14			Windows, lower front, opening	3	6
Windows, sliding side			Windows, sliding side	4	8
Wiper and washer, rear			Wiper and washer, rear	7	16

# 140H Motor Grader

AEHQ5280 (12-98)  
(Replaces AEHQ0063-02)

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Featured machines in photos may include additional equipment.  
See your Caterpillar dealer for available options.

