# 135H
## Motor Grader


## Standard Version

| Cat ® 3116 turbocharged and aftercooled diesel engine with Engine Power Management | | |
|---|---|---|
| Gears 4 - 8 | 116 kW | 155 hp |
| Gears 1 - 3 | 101 kW | 135 hp |
| Blade width | 3658 mm | 12 ft |

| Operating weights (approximate) (Equipped with hydraulic side shift and tip, high profile ROPS cab, differential with lock/unlock) | | |
|---|---|---|
| Operating weights (approximate) | | |
| On front wheels | 3756 kg | 8274 lb |
| On rear wheels | 9152 kg | 20,158 lb |
| Total machine | 12 908 kg | 28,432 lb |

# Engine

Four-stroke cycle, six cylinder Caterpillar 3116 turbocharged and aftercooled diesel engine with engine power management (EPM).

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

| **Ratings at 2000 rpm*** | kW | hp |
|---|---|---|
| Gross power | 124 | 166 |

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

| Net power | kW | hp |
|---|---|---|
| Caterpillar | 116 | 155 |
| ISO 9249 | 116 | 155 |
| SAE J1349 | 116 | 155 |
| EEC 80/1269 | 116 | 155 |
| Peak torque (net) @ 1400 rpm | 719 Nm | 529 lb-ft |
| Torque rise | | 30% |

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

| **Ratings at 2000 rpm*** | kW | hp |
|---|---|---|
| Gross power | 109 | 146 |

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

| Net power | kW | hp |
|---|---|---|
| Caterpillar | 101 | 135 |
| ISO 9249 | 101 | 135 |
| SAE J1349 | 101 | 135 |
| EEC 80/1269 | 101 | 135 |
| Peak torque (net) @ 1400 rpm | 639 Nm | 472 lb-ft |
| Torque rise | | 33% |

### Dimensions

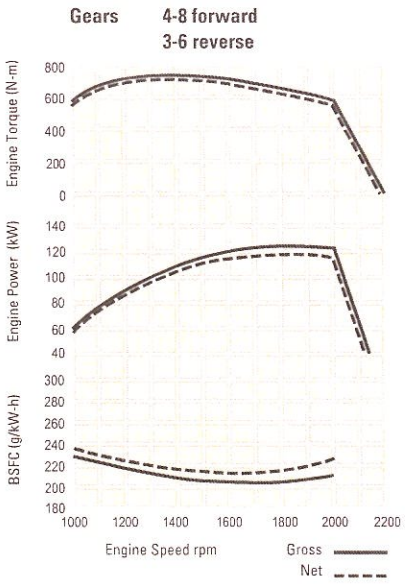
| | | |
|---|---|---|
| Bore | 105 mm | 4.13 in |
| Stroke | 127 mm | 5.00 in |
| Displacement | 6.6 liters | 403 cu in |

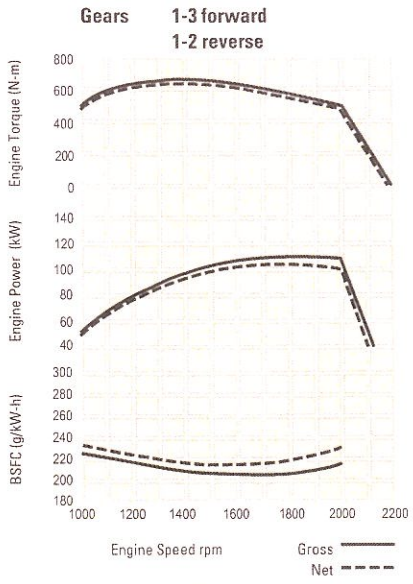
### *Power rating conditions

- 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 3750 m (12,304 ft) altitude

### Features

- direct injection fuel system with individual adjustment-free unit injectors
- 3-ring aluminum alloy pistons
- heat resistant stellite-faced valves
- forged steel connecting rods
- one-piece cylinder head designed with cast intake manifold
- cast cylinder block with oil cooler cavity cast into block
- induction-hardened, forged crankshaft
- direct electric 24-V starting and charging system
- two 12-V, 100 amp-hour, 750 CCA, maintenance-free batteries
- 35-amp alternator
- plate-type, water-cooled oil cooler
- vertical-flow, steel-fin, tube-type radiator
- dry-type, radial-seal air cleaner with primary and secondary elements
- dual fuel filters
- resiliently mounted to rear frame



## Hydraulic System

Proportional priority pressure compensated system.

| | | |
|---|---|---|
| Output at 2000 rpm and 24 150 kPa (3500 psi) | 148 liters/min | 39.0 gpm |
| With optional high capacity pump output at 2000 rpm and 24 150 kPa (3500 psi) | 190 liters/min | 49.5 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**

- six, closed-center control valves standard:
  - Ñ right blade lift
  - Ñ left blade lift
  - Ñ circle drive
  - Ñ centershift
  - Ñ front wheel lean
  - Ñ articulation
- 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 circuits are incorporated into the control valves
- 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
- reliable couplings with O-ring face seals
- full-flow filter
- high capacity pump beneficial when using multiple functions simultaneously

## Transmission

Direct drive, power shift transmission with eight speeds forward.

**Maximum travel speeds (at rated rpm with standard 13.00-24 tires)**

| | | km/h | mph |
|---|---|---|---|
| Forward | 1 | 3.6 | 2.3 |
| | 2 | 4.9 | 3.1 |
| | 3 | 7.2 | 4.5 |
| | 4 | 9.9 | 6.2 |
| | 5 | 15.4 | 9.6 |
| | 6 | 20.9 | 13.0 |
| | 7 | 28.8 | 17.9 |
| | 8 | 41.9 | 26.0 |
| Reverse | 1 | 2.9 | 1.8 |
| | 2 | 5.4 | 3.3 |
| | 3 | 7.8 | 4.9 |
| | 4 | 12.2 | 7.6 |
| | 5 | 23.0 | 14.3 |
| | 6 | 33.1 | 20.6 |

**Features**

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

## Service Refill Capacities

| | liters | gallons |
|---|---|---|
| Fuel tank | 284 | 75.0 |
| Cooling system | 40 | 10.4 |
| Crankcase | 23 | 6.0 |
| Transmission, differential and final drives | 47 | 12.2 |
| Tandem housing (each) | 61 | 15.9 |
| Hydraulic system | 61 | 16.0 |
| 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)* | 7.2 m | 23' 8" |
| Steering range | 50¡ Left/Right | |
| Articulation angle | 20¡ Left/Right | |

* Using front wheel steering, frame articulation and with optional 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

## Frame

Flanged, box section design.

**Dimensions**

| Front frame | mm | in |
|---|---|---|
| Top and bottom plates | | |
| Width | 280 | 11 |
| Thickness | 22 | 0.9 |
| Side plates | | |
| Width | 236 | 9.3 |
| Thickness | 10 | 0.4 |

**Linear weights**

| Front frame | kg/m | lb/ft |
|---|---|---|
| Minimum | 134 | 90 |
| Maximum | 172 | 115 |

**Section modulus**

| Front frame | cu cm | cu in |
|---|---|---|
| Minimum | 1619 | 99 |
| Maximum | 3681 | 225 |

**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 | 608 mm | 23.9" |
| 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 | 502 | 19.8 |
| Width | 172 | 6.8 |
| Sidewall thickness | | |
| Inner | 14 | 0.55 |
| Outer | 16 | 0.63 |
| Drive chain pitch | 44.5 | 1.75 |
| Wheel axle spacing | 1510 | 59.5 |
| Tandem oscillation | 15¡ Forward<br>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
- 18 604 $cm^2$ (2884 $in^2$) 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 $cm^2$ (297 $in^2$) 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 capacities
- 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 |
|---|---|---|
| 13.00-24 | 9" x 24" | SP |
| | 10" x 24" | MP |
| 14.00-24 | 9" x 24" | SP |
| | 10" x 24" | MP |
| 15.5-25 | 13" x 25" | SP |
| 17.5-25 | 13" x 25" | SP |
| | 14" x 25" | MP |

SP = Single-Piece Rim
MP = Multi-Piece Rim

Notes: An assortment of bias and radial tire models are available from various manufacturers offering 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**

- four shoes support circle
- all shoes have vertical and horizontal adjustment
- nine replaceable nylon composite wear strips between circle and drawbar
- four replaceable nylon composite wear strips between the circle and support shoes

## Circle

Circle is fabricated T-section.

**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
- 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 | 16 | 0.63 |

| Endbit | mm | in |
|---|---|---|
| Width | 152 | 6 |
| Thickness | 16 | 0.63 |

**Features**

- cutting edge and endbit are Caterpillar through-hardened, curved DH-2 steel
- 16 mm (.63") diameter bolts
- three sideshift mounting locations for optional 4267 mm (14') moldboard

**Optional hydraulic sideshift**

- heat-treated sideshift rails
- replaceable metallic wear inserts

## Blade Range

Full range of blade positioning.

| | | | 3-Position Link Bar | | 7-Position Link Bar | |
|---|---|---|---|---|---|---|
| | | | mm | in | mm | in |
| Circle centershift | | Right | 460 | 18.1 | 628 | 24.7 |
| | | Left | 690 | 27.2 | 625 | 24.6 |
| Moldboard sideshift | (mechanical) | Right | 660 | 26.0 | 660 | 26.0 |
| | | Left | 660 | 26.0 | 660 | 26.0 |
| | (hydraulic) | Right | 660 | 26.0 | 660 | 26.0 |
| | | Left | 524 | 20.6 | 524 | 20.6 |
| Maximum shoulder reach outside of tires | (mechanical) | Right | 1760 | 69.3 | 1912 | 75.3 |
| | | Left | 1976 | 77.8 | 1976 | 77.8 |
| | (hydraulic) | Right | 1760 | 69.3 | 1912 | 75.3 |
| | | Left | 1840 | 72.4 | 1840 | 72.4 |
| Maximum lift above ground | | | 457 | 18.0 | 457 | 18.0 |
| Maximum depth of cut | | | 728 | 28.7 | 775 | 30.5 |
| Maximum blade position angle | | | 65¡ Both Sides | | 90¡ Both Sides | |
| Blade tip range | (mechanical and hydraulic) | | 40¡ Forward | | 40¡ Forward | |
| | | | 5¡ Backward | | 5¡ Backward | |

**Features**

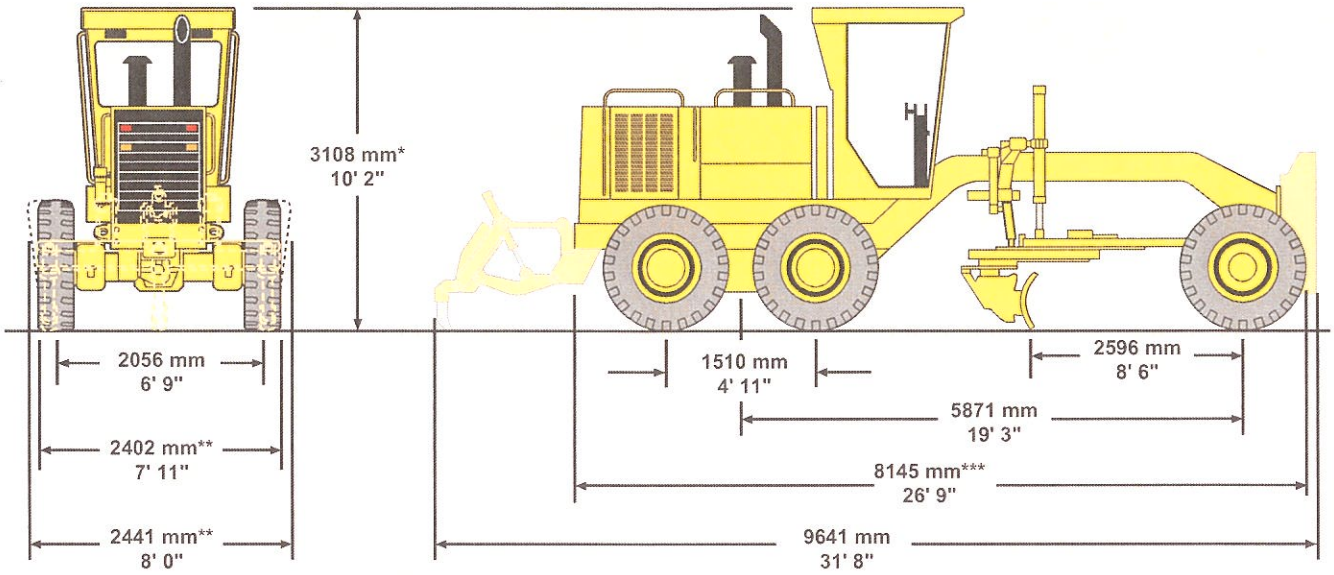
- steep ditch cutting angles possible
- aggressive blade carrying angles possible
- 1.5:1 and 2:1 back slope can be done without putting front tire on slope with optional 7-position link bar

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 | 3462 kg | 7632 lb |
| on rear wheels | 8326 kg | 18,357 lb |
| total machine | 11 788 kg | 25,989 lb |

Operating weights based on standard machine configuration with 13.00-24 10PR (G-2) tires, full fuel tank, coolant, lubricants and operator.

Operating weights (approximate)
(Equipped with hydraulic side shift and tip, high profile ROPS cab and differential with lock/unlock)

| | | |
|---|---|---|
| on front wheels | 3756 kg | 8,274 lb |
| on rear wheels | 9152 kg | 20,158 lb |
| total machine | 12 908 kg | 28,432 lb |

* with optional low-profile cab;
add 225 mm (8.9") for optional full height cab or canopy

** add 267 mm ( 10.5") for optional 17.5-25 tires

*** add 235 mm (9.3") for front pushplate
add 117 mm (4.6") for rear hitch or
add 1261 mm (4' 2") for rear-mounted ripper

Note: Height without ROPS, exhaust, or other easily removed encumberances 2.95 m (9'7").

## Scarifier and Ripper

| Type | V-Type-Scarifier (mid-mounted) | | Ripper (rear-mounted) | |
|---|---|---|---|---|
| Working width | 1184 mm | 46.6" | 2300 mm | 91" |
| Scarifying depth, maximum | 292 mm | 11.5" | Ñ | |
| Scarifier shank holders: | | | | |
| number | 11 | | Ñ | |
| spacing | 116 mm | 4.6" | Ñ | |
| Ripping depth, maximum | Ñ | | 262 mm | 10.3" |
| Ripper shank holders: | | | | |
| number | Ñ | | 5 | |
| spacing | Ñ | | 533 mm | 21" |
| Increase in machine length, beam raised | Ñ | | 688 mm | 27.1" |
| Penetration force* | Ñ | | 4343 kg | 9566 lb |
| Pryout force | Ñ | | 2279 kg | 5020 lb |

*Varies with machine configuration.

# 135H Motor Grader

www.CAT.com

© 1998 Caterpillar
Printed in U.S.A.

AEHQ5275 (11-98)
(Replaces AEHQ5124-01)

Materials and specifications are subject to change without notice.
Featured machines in photos may include additional equipment.
See your Caterpillar dealer for available options.

CATERPILLAR®