CATERPILLAR

12G
Motor Grader

Model shown may include optional equipment.

Summary of features

- **Articulated frame, sharp turning front wheels, and tandem drive train differential** provide excellent maneuverability and short turning radius.
- **Low profile ROPS cab** combines convenient control placement with the comfort of sit-down operation and Electronic Monitoring System (EMS).
- **Single lever, direct drive power shift transmission** with 6 speeds forward and 6 reverse.
- **101 kW/135 flywheel power** Cat diesel Engine . . . 31% torque rise results in excellent luggability.
- **Quiet operation** . . . large-diameter, low-speed engine fan . . . rear-mounted transmission . . . rubber-mounted hydraulic pump and tank . . . low profile ROPS cab (standard in U.S. and Canada), low sound level muffler and engine compartment doors optional.
- **Four-wheel oil disc brakes** provide positive stopping performance . . . adjustment-free . . . completely sealed . . . dual circuit air system provides extra protection.

Caterpillar Engine

Flywheel power @ 2200 RPM . . . . . 101 kW/135 HP (Kilowatts (kW) is the International System of Units equivalent of horsepower.)

The net power at the flywheel of the vehicle engine operating under SAE standard ambient temperature and barometric conditions, 29° C/85° F and 995 mbar/29.38" Hg, using 35 API gravity fuel oil at 16.6° C/60° F, and after deductions for fan, air cleaner, water pump, lubricating oil pump, fuel pump, muffler and alternator. No derating is required up to 750 m/2,500 ft. altitude.

Caterpillar 4-stroke-cycle 3306 diesel Engine with six cylinders, 121 mm/4.75" bore, 152 mm/6" stroke and 10.5 liters/638 cu. in. piston displacement.

Direct injection Caterpillar fuel system with individual adjustment-free injection pumps and valves.

Cam-ground and tapered aluminum alloy pistons with three-ring design; one compression ring rides in iron band cast into piston. Piston undersides are cooled by oil spray.

Steel-backed aluminum alloy precision bearings. High-carbon steel alloy crankshaft with Hi-Electro hardened journals.

Pressure lubrication with full-flow filtered oil and oil cooler. Dry-type air cleaner with primary and safety elements, automatic dust-ejector and service indicator.

Uses economical No. 2 fuel oil (ASTM Specification D396), often called No. 2 furnace or burner oil, with a minimum cetane rating of 35. Premium quality fuel can be used but is not required.

24-volt direct electric starting system with 35-amp alternator and optional ether starting aid.

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transmission

Caterpillar direct drive power shift. Single lever at operator's right controls six forward and six reverse speeds. Foot pedal provides inching capability for close quarter maneuvering. Transmission lock prevents accidental gear engagement. The machine won't move even if the engine is started with transmission engaged.

Speeds (at rated RPM):

Forward & Reverse	1st	2nd	3rd	4th	5th	6th
km/h	3.7	6.0	9.5	15.6	25.0	39.4
MPH	2.3	3.7	5.9	9.7	15.5	24.5

blade controls

Full hydraulic controls provide fast, constant control speed, regardless of engine speed. Lock valves in each implement circuit eliminates drift. Operator controls all blading operations with six levers — left blade lift, blade sideshift, blade tip, circle reverse, centershift and right blade lift. Hydraulic system lets operator use more than one control without decrease in control response speed.

circle

Seamless steel forging, 1530 mm/60.25" diameter. Uniform, flame-cut teeth. Raised wear surfaces top and bottom prevent circle teeth from contacting support shoes. Hydraulically driven worm and gear provide full 360° circle rotation.
Optional circle drive slip clutch.

Blade beam — width x thickness ..... 178 x 32 mm/7" x 1.25"

blade range

Circle centershift, right ..... 520 mm/20.5"
Left ..... 650 mm/25.5"

Moldboard sideshift, hydraulic, right ..... 670 mm/26.5"
Left ..... 520 mm/20.5"

Maximum shoulder reach outside of tires.*
Right ..... 1.870 m/6'1.5"
Left ..... 1.830 m/6'
Maximum blade position, angle, both sides ..... 90°**
Maximum lift above ground ..... 440 mm/17.25"
Maximum depth of cut ..... 450 mm/17.75"
Hydraulic blade tip ..... 40° forward; 5° rear

*For 4267 mm/14' blade, add 305 mm/12" right or left. With main frame in crab position, add 940 mm/3'1" right or left.
**Mid-range bank sloping (2:1) capability requires addition of optional centershift cylinder extension.

moldboard

Wear-resistant, high-carbon steel, with box-section reinforcement. Induction-hardened sideshift rails.
Length x height x thickness ..... 3658 x 610 x 22 mm/ 12' x 24" x .88"

Cutting edge — Caterpillar through-hardened curved DH-2 steel with reversible overlay end bits and 16 mm/.62" diameter bolts.
Width x thickness ..... 152 x 16 mm/6" x .62"

drawbar

Box-section, 140 x 89 x 13 mm/5.5" x 3.5" x 0.5" A-frame with six widely spaced shoes to support the circle. All have vertical and horizontal adjustment.

frame

Main frame — flanged, box-section structure runs from front bolster to the articulation joint.
Top and bottom plates —
width x thickness ..... 305 x 21 mm/12" x .88"
Side plates —
height x thickness ..... 248 x 13 mm/9.75" x 0.5"
Minimum weight ..... 47 kg/m/104 lb./ft.
Minimum vertical section modulus ..... 1912 cm cubed/ 116.7 inches cubed

Rear frame — two box-sectioned channels integral with final drive case.

axles

Front — solid steel arched bar provides 610 mm/24" ground clearance. Oscillates total of 32°.
Front wheel lean angle ..... 18° left or right

Rear — full-floating, forged heat-treated steel.

tandems

Height x width ..... 466 x 201 mm/18.38" x 7.90"
Sidewall thickness, outer ..... 18 mm/.71"
inner ..... 16 mm/.62"
Drive chain pitch ..... 51 mm/2"
Wheel axle spacing ..... 1520 mm/5'

steering

Front wheels — Full two cylinder hydraulic steering system.
Steering range ..... 50° left or right

Frame — hydraulically actuated steering ..... 20° left or right
Minimum turning radius
(outside front tires) ..... 7.3 m/24'*

*Using front wheel steering, frame articulation and differential unlock.

wheels

Interchangeable rim and wheel assemblies. Tubeless tires, six 13.00 — 24, 10 PR (G-2) traction-type.

brakes

(System meets OSHA regulations.)

Service — Four-wheel, air-actuated, oil disc brakes are completely sealed and adjustment-free. Low air pressure, below 31 kPa (65 bar) 4.5 psi, in either circuit of the brake system is indicated to the operator by visual (red light) and audible (horn) warnings.

Parking — Multiple oil disc located in transmission case, manually actuated, spring-engaged, air disengaged. Push the red lever on the transmission control console forward to actuate. This neutralizes the transmission, engages the parking brake and activates the transmission neutral lock to prevent machine movement if engine is started with transmission engaged.

Emergency — Dual circuit air system includes an individual circuit to each tandem for added braking protection. A malfunction in one circuit still leaves the machine with at least half its original braking capacity for emergency stops.

In the event of loss of service brakes, the spring-actuated, non-modulated parking brake can be applied to bring the machine to a stop, even if the air supply is interrupted. (Method not recommended for repeated applications.)

ROPS

(Low profile ROPS cab is standard in U.S.A.)
ROPS (Rollover Protective Structures) offered by Caterpillar for this machine meet ROPS criteria: SAE J396, SAE J1040a and ISO 3471. They also meet FOPS (Falling Object Protective Structure) criteria SAE J231 and ISO 3449.

hydraulics

Closed center, constant pressure system with Caterpillar variable displacement piston **pump** powers **blade** controls, wheel lean, steering, articulation and attachments. Constant pressure, parallel-control-valve circuit design provides immediate **implement** response. Dual-level pump capacity matches horsepower use to system needs. **Hydraulic lock valves** in all implement circuits prevent undesirable cylinder drift.

Output @ 2200 engine RPM and 14824 kPa (148 bar) **2150 psi** ..... 11.4 to 193 **liters/min/3 to 51 gpm** depending upon system requirements.

service refill capacities

	Liters	U.S. Gallons
Fuel tank	284	75
Radiator	45	12
Crankcase	29	7.75
Transmission, differential and final drive	79	21
Tandem housings (each)	64	17
Hydraulic system	76	20

operating weight (approximate)

Basic operating weight (includes lubricants, coolant, full fuel tank, operator, 3658 mm/**12'** hydraulic sideshift blade and 13.00 — 24, 10 PR (G-2) traction tires and low profile ROPS cab (standard in U.S):

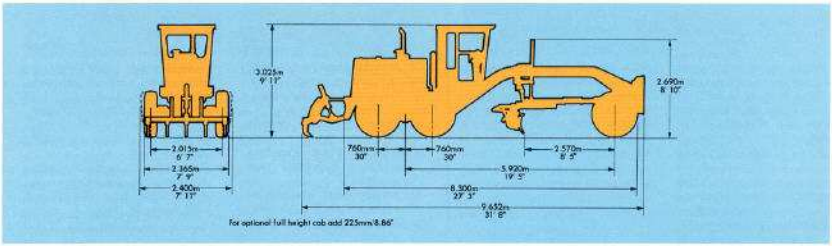
	Kg	Lb
Weight on front wheels	3730	8,215
Weight on rear wheels	9670	21,310
Total weight	13 400	29,525
Equipped as above and including V-type scarifier:		
Weight on front wheels	4482	9,880
Weight on rear wheels	9843	21,700
Total weight	14 325	31,580

Add or subtract weights of additional equipment from Attachment Selection list to obtain **total equipped operating weight.**

attachment selection

(with approximate installed weights)

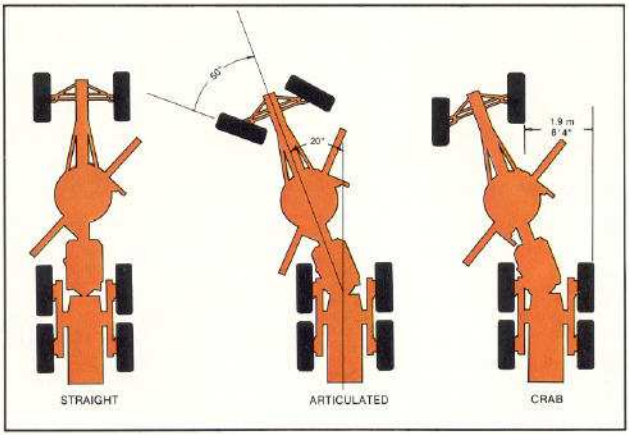
	Kg	Lb
Air conditioner/heater/pressurizer	141	310
Air dryer	13	28
Alternator, 50-amp	5	11
Automatic Blade Control:		
With 4267 mm/14' blade	328	725
With 3658 mm/12' blade	201	445
Blade, 4267 mm/14'	81	178
Blade extension, 610 mm/2':		
Right	91	200
Left	91	200
Blade lift accumulator	54	121
Cab, ROPS, full height, sound-suppressed	41	90
Canopy, ROPS, includes rear wall with window		
Full height	−195	−430
Low profile	−218	−480
Clutch, slip for circle drive	11	25
Cutting edges, 203 x 19 mm/8" x .75":		
For 4267 mm/14' blade	74	164
For 3658 mm/12' blade	47	104
Cylinder extension, centershift	14	30
Defroster, fan, rear	1	3
Engine compartment doors	114	251
Ether starting aid	1	2
Fast-fill fuel system, automatic shut-off	2	4
Gauge, water temperature	.5	1
Heater/pressurizer, cab includes hoses, engine coolant	24	53
Hydraulic arrangements with one or more additional hydraulic valves are available for hydraulic blade sideshift, tip, V-type scarifier and rear-mounted ripper-scarifier; and for attachments from other suppliers, such as snow plows and snow wings and bulldozer.		
Jack, hydraulic	9	21
Lighting systems:		
Cab-mounted directional signals	7	15
Light bar-mounted directional signals	4	9
Cab-mounted headlights (2)	2	5
Front-mounted headlights (2)	12	27
Center-mounted floodlights (2)	4	8
Rear-mounted floodlight	2	5
Warning beacon (amber)	4	8
Mirror, outside, right or left, for cab or canopy	9	19
Muffler, sound suppression	27	59
Oil change system, fast	2	5
Prescreener	2	5
Pressurizer	17	38
Push plate	458	1,010
Rims, 254 mm/10", set of six, for use with 14.00 — 24 tires	115	253
Ripper-scarifier, includes 3 shanks	970	2,130
Scarifier, front V-type	912	2,010
Straight-type, 17 teeth	987	2,175
Spare tire and wheel, 13.00 — 24, 10 PR	139	306
Starting system, low temperature	10	21
Tachograph drive	10	21
Tires, set of six:		
13.00 — 24, 12 PR traction	41	90
14.00 — 24, 12 PR traction	71	156
14.00 — 24, 10 PR traction	16	36
15.50 — 25, 8 PR traction (includes wheels and rims)	98	216
15.50 — 25, 12 PR rock (includes wheels and rims)	256	564
Tool kit	8	18
Vandalism protection: available are an instrument panel guard and cap locks for hydraulic tank, radiator, fuel tank, transmission gauge and engine oil	8	17
Windshield wiper, rear	4	8



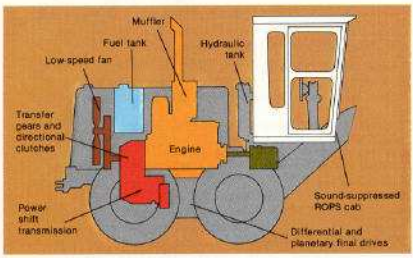
Maneuverability — easier, faster, shorter turns. You can do more work.

Three steering techniques . . . for best match to job, an important advantage in productivity over conventional motor grader design.

- **Straight frame,** with main frame centered and only front wheels used for steering, is best for long-pass blading.
- **Articulated turn** uses the full 20° frame articulation, 50° front wheel steering angle and unlocked tandem drive train differential for shortest turning radius. Result is easier maneuvering in close quarters, quicker turn-around at the end of a pass, plus ability to carry a full blade load around a curve.
- **Crab steering** helps compensate for side drift when turning a windrow, keeps tandems on firm footing when cleaning a wet ditch, increases stability for side slope work, and side thrust when using a snow wing. Frame is fully articulated, with front wheels turned parallel to tandems.



Quiet operation — a noticeable difference, by design.



Quiet power train has engine flywheel facing rearward to get transmission sound and vibration away from the operator's compartment. Helical design transfer gearing cuts sound. The fan is large diameter, slower turning. Fuel tank placed between the fan and cab area helps keep fan sound away from the operator. The optional muffler has extra capacity. Low profile ROPS cab is sound-suppressed, with sound absorbing material in roof and rear, and sound reducing floor mat. Cab front and sides are flared to further reduce effects of sound waves. The optional ROPS canopies have a rear wall and window to cut down operator sound exposure.

Serviceability — less time on maintenance, easier repair.

Less maintenance time compared to conventional design graders means more work time. Series G Graders have:

- **Significantly fewer grease fittings.**
- **More accessible checkpoints** — most can be checked from the ground.
- **Automatic dust ejector** — diverts dust from intake air, blows it out exhaust.

- **Spin-on oil and fuel filters** — disposable, easy to change, non-contaminating.
- **Outside-mounted hydraulic valves** — easier to check and service than those mounted inside a tank.
- **Transmission or other major components** can be removed as units without disturbing rest of power train.

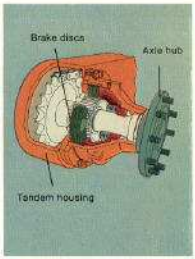
The operator's machine — true sit-down operation . . . visibility and convenience unmatched in conventional designs.

Environment for efficiency — that's the Series G Compartment. An adjustable control console moves out of the way for easy entry and exit. It pulls back to the operator for any of three working positions and true sit-down operation without tiresome hand and arm movement. Steering wheel is tilt adjustable, too, so the operator can pick the most comfortable overall position. The suspension seat is contoured,

deeply padded and adjustable. Blade levers are arranged in the familiar Caterpillar pattern for easy operator orientation. Transmission control is a single lever to the operator's right. It's full power shift — no manual clutching — so he can shift up or down without stopping the machine or losing time or momentum. An "inching" pedal lets him ease up to curbs or obstructions.

Work area visibility is excellent because of control location and frame design. An operator can work with increased confidence. While seated, he can see both ends of the blade and the ground ahead much better than on conventional machines. The Series G main frame is a single member all the way to the front axle. The top of the frame has none of the usual blade linkage obstructing the forward view.

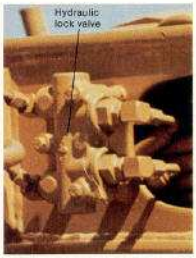
Protection . . . for man and machine.



Four-wheel oil disc brakes are bathed in oil and sealed to the environment. They need none of the periodic adjustment and lining replacement typical of shoe-type brakes. Each tandem set is activated by its own air circuit, so failure in one circuit still leaves half the original braking capacity. Choice of ROPS cabs or canopies, work lights, directional signals, other protective items are available for specific user needs.

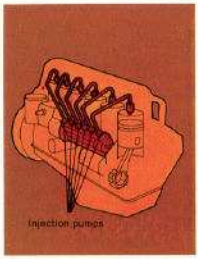
Full hydraulic blade controls — effortless, fast, precise action.

Hydraulic blade control levers engage smoothly and crisply. Response is immediate and always predictable regardless of engine RPM, or with two or more levers engaged at once. Variable displacement piston pump senses hydraulic system needs and automatically adjusts hydraulic flow and pressure to match. Closely spaced levers and short travel engagement reduce operator effort.

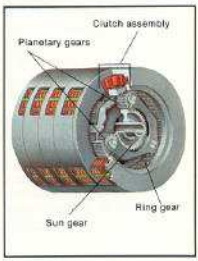


Lock valves in hydraulic circuits eliminate a major problem found in traditional grader hydraulic systems: blade creep and drift. These valves provide the Series G grader with positive hold at each blade setting, essential for precise finish grading.

Reliable Cat Power Train — simple, efficient.



Durable Cat 3306 diesel Engine powers the 12G. It features the proven adjustment-free Cat fuel system, with replaceable individual injector pumps and valves. Separate fuel injection valves resist clogging and can be replaced without system rebalancing. Optional ether starting aid is available for cold weather starting.



Direct drive power shift transmission was designed specifically for motor graders. It has no torque converter to cause lags or surges, just smooth no-clutch one-lever shifting with direct drive feel. Compact planetary gear sets provide high reduction in minimum space. Large diameter clutch assemblies have high holding capacity. Plates are continuously lubricated and cooled by oil.

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Caterpillar Automatic Blade Control helps the operator obtain increased blading accuracy. Preset by operator to maintain slope or grade finish specifications, it provides excellent application versatility . . . as operator has choice of using manual controls only, automatic slope control only, automatic grade control only or automatic grade and slope simultaneously. Grade follower (wand, wheel or skid shoe) can be attached to either end of moldboard. Stabilizer system matches moldboard response to machine travel speed.

Low profile ROPS cab combines convenient control placement with the comfort of sit-down operation. EMS gives you system status at a glance. Oversized windows and improved sealing offer excellent visibility and weather insulation. Machine can be easily transported without the removal of low profile ROPS cab. Full doors permit entry from either side. Includes sound suppression, inside-mounted rear view mirror, dome light, front window washer, three wipers, and sweep clean floor. Available accessories include pressurizer/air conditioner/heater, pressurizer/heater, outside mounted side view mirrors, rear window wiper and rear defroster fan. ROPS is also available as open version (canopies) without front windshield or doors.

Blade lift accumulator system provides cushioning action for blade lift hydraulic circuits. Recommended for use on maintenance of hard, rocky roads. Includes on-off control.

V-type scarifier — mounted forward of the moldboard, used for mixing, breaking up base course, asphalt, slabby and frozen materials. Standard arrangement includes 11 scarifier shanks.

Specifications:

	Front-Mounted Scarifiers		Rear-Mounted Ripper-Scarifier
	V-type	Straight	
Working width	1180 mm 46.6"	1800 mm 71"	2200 mm 86.5"
Scarifying depth, maximum	292 mm 11.5"	317 mm 12.5"	282 mm 11.1"
Ripping depth, maximum	—	—	430 mm 17.1"
Scarifier shank holders, number and spacing	11 @ 117 mm/ 4.6"	17 @ 111 mm/ 4.38"	9 @ 270mm/ 10.5"
Ripper shank holders, number and spacing	—	—	5 @ 530 mm/ 21"
Increase in machine length, beam raised	—	—	1.190 m 3'11"

standard equipment

35-amp alternator. Dry-type air cleaner with precleaner, automatic dust ejector and air cleaner service indicator. Blower fan. Muffler. Hand throttle. Accelerator/decelerator. Power shift transmission. Lock-Unlock tandem drive train differential. Articulated frame with articulation indicator in operator's compartment. 3658 mm/12' hydraulic sideshift moldboard with tip control. 152 x 16 mm/6" x .62" DH-2 steel cutting edges, reversible overlay end bits with 16 mm/.62" diameter bolts. Electronic Monitoring System (EMS). Horn. Backup alarm (U.S.). Four-wheel oil disc brakes. Parking brake. Low profile ROPS cab (U.S.). Stop and tail lights. Suspension seat. Seat belt. Tilt adjustable steering wheel and control console. Rear drawbar. Lockable tool box and fuel cap, with padlocks. 13.00 — 24, 10 PR (G-2) traction-type tires.

Materials and specifications are subject to change without notice.

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