



# 24

## Motor Grader

# Technical Specifications

Configurations and features may vary by region. Please consult your Cat® dealer for availability in your area.

### Table of Contents

<b>Specifications</b> .....	<b>2</b>
Engine .....	2
Net Power .....	2
Power Train .....	2
Hydraulic System .....	2
Operating Specifications .....	3
Service Refill .....	3
Front Axle and Tandems .....	3
Moldboards .....	3
Drawbar and Circle .....	3
Ripper .....	4
Weights – Tier 4 Final/Stage V .....	4
Weights – U.S. EPA Tier 3 Equivalent .....	4
Standards .....	4
Sound Standards .....	4
Air Conditioning .....	4
Dimensions .....	5
Optional Tire Arrangements .....	5
<b>Standard and Optional Equipment</b> .....	<b>6</b>
<b>24 Environmental Declaration</b> .....	<b>8</b>

# 24 Motor Grader Specifications

## Engine

Engine Model	Cat® C27	
Emissions	U.S. EPA Tier 4 Final/ EU Stage V or Equivalent to U.S. EPA Tier 3	
Net Power (ISO 9249:2007)	399-518 kW	535-694 hp
Engine Power (ISO 14396:2002)	561 kW	752 hp
Displacement	27.0 L	1,649.5 in <sup>3</sup>
Bore	137.2 mm	5.4 in
Stroke	152.4 mm	6.0 in
Maximum Torque (ISO 9249:2007)	3277 N·m	2,417 lbf-ft
Top Forward Speed	41.9 km/h	26.0 mph
Derating Altitude		
Tier 4 Final/Stage IV	3048 m	10,000 ft
Tier 2/Stage II equivalent	4572 m	15,000 ft
Standard Capability	50° C	122° F
Biodiesel Capability <sup>(1)</sup>	Up to B20*	

• The 24 is offered with two variations of the C27 engine. One meets Tier 4 Final/Stage V emission standards and is required for highly regulated countries. The other option emits equivalent to U.S. EPA Tier 3 and is available for less regulated countries. Stage IV engines comply with the transition provisions of the EU nonroad emission regulation.

• On Tier 4 Final/Stage V machines, Ultra Low Sulfur Diesel (ULSD) and lower ash oil are required.

<sup>(1)</sup>Cat® engines equivalent to U.S. EPA Tier 3 or U.S. EPA Tier 2 and EU Stage II, are compatible with diesel fuel blended with the following lower-carbon intensity fuels up to:

- ✓ 100% biodiesel FAME (fatty acid methyl ester)\*\*
- ✓ 100% renewable diesel, HVO (hydrotreated vegetable oil) and GTL (gas-to-liquid) fuels

Refer to guidelines for successful application. Please consult your Cat dealer or “Caterpillar Machine Fluids Recommendations” (SEBU6250) for details.

\*Engines with no aftertreatment devices can use higher blends, up to 100% biodiesel (For use of blends higher than 20% biodiesel, consult your Cat dealer).

\*\*For use of blends higher than 20% biodiesel, consult your Cat dealer.

## Net Power

Gear	Net kW	Net HP	Metric HP
Forward			
1st	399	535	543
2nd	399	535	543
3rd	407	546	554
4th	424	569	577
5th	463	621	630
6th	518	694	704
Reverse			
1st	399	535	543
2nd	399	535	543
3rd	463	621	630

• Net power is tested per ISO 9249:2007 at rated speed of 1,800 rpm and includes an engine equipped with fan, air cleaner, muffler/after treatment and alternator.

## Power Train

Forward/Reverse Gears	6 forward/3 reverse	
Transmission	Automatic, electronic, Power Shift	
Brakes		
Service	Oil-actuated, oil-disc	
Dynamic Brake Torque Per Wheel	75 383 N·m	55,600 lbf-ft
Parking	Spring applied, hydraulically released	
Secondary	Oil-actuated, oil-disc	

## Hydraulic System

Circuit Type	Electro-hydraulic load sensing, closed center	
Pump Type	Variable piston	
Pump Output	504 L/min	133 gal/min
Maximum System Pressure	24 100 kPa	3,495 psi
Standby Pressure	5800 kPa	841.2 psi

• Pump output measured at 1,800 rpm.

# 24 Motor Grader Specifications

## Operating Specifications

Top Speed		
Forward	41.9 km/h	26 mph
Reverse	41.2 km/h	25.6 mph
Turning Radius, Outside Front Tires	12.5 m	41 ft
Steering Range – Left/Right	47.5 degrees	
Articulation Angle – Left/Right	25 degrees	
Forward		
1st	4.8 km/h	3.0 mph
2nd	6.9 km/h	4.3 mph
3rd	10.3 km/h	6.4 mph
4th	14.9 km/h	9.3 mph
5th	28.9 km/h	18.0 mph
6th	41.9 km/h	26.0 mph
Reverse		
1st	6.8 km/h	4.2 mph
2nd	14.7 km/h	9.1 mph
3rd	41.2 km/h	25.6 mph

- Machine speed measured @ 1,800 rpm with 29.5R29 radial tires, no slip.

## Service Refill

Fuel Capacity	908 L	240 gal
Cooling System	191 L	50.5 gal
Hydraulic System		
Total	270 L	71.3 gal
Tank	130 L	34.3 gal
Engine Oil	99 L	26.2 gal
Transmission	122 L	32.2 gal
Differential and Final Drives	190 L	50.2 gal
Tandem Housing (each)	322 L	85.1 gal
Front Wheel Spindle Bearing Housing (each)	4 L	1.1 gal
Circle Drive Housing (each)	8 L	2.1 gal

## Front Axle and Tandems

Front Axle		
Height to Center	882 mm	34.7 in
Wheel Lean, Left/Right	18 degrees	
Total Oscillation Per Side	32 degrees	
Tandem Oscillation		
Front Up	20 degrees	
Front Down	20 degrees	

## Moldboards

Width			
Standard	7.3 m	24 ft.	
Optional	8.5 m	28 ft.	
Height	1067 mm	42.0 in	
Thickness	50 mm	2.0 in	
Throat Clearance	162 mm	6.4 in	
Blade Pull*			
Base GVW	46 612 kg	102,762 lb	
Maximum GVW	50 123 kg	110,502 lb	
Down Force			
Base GVW	33 001 kg	72,755 lb	
Maximum GVW	34 014 kg	75,104 lb	

- \*Blade pull calculated at 0.9 traction coefficient, which is equal to ideal no-slip conditions, and Gross Machine Weight.

## Drawbar and Circle

Circle Centershift			
Right	437 mm	17.2 in	
Left	804 mm	31.7 in	
Moldboard Sideshift			
Right	1150 mm	45.3 in	
Left	970 mm	38.2 in	
Maximum Blade Position Angle	59 degrees		
Blade Tip Range			
Forward	40 degrees		
Backward	0 degrees		
Maximum Shoulder Reach Outside of Tires			
7.3 m (24 ft) Right	3200 mm	126.0 in	
7.3 m (24 ft) Left	3175 mm	125.0 in	
28 ft. Moldboard			
8.5 m (28 ft) Right	3810 mm	150.0 in	
8.5 m (28 ft) Left	3785 mm	149.0 in	
Maximum Lift Above Ground	373 mm	14.7 in	
Maximum Depth of Cut	626 mm	24.6 in	

- Maximum lift above ground and depth of cut with 406 mm × 60 mm (16 in × 2.4 in) cutting edges.
- A working angle of 55 degrees is recommended to achieve the best clearance for the tires and ladders.

# 24 Motor Grader Specifications

## Ripper

Ripping Depth – Maximum	454 mm	17.9 in
Ripper Shank Holders	7	
Shank Holder Spacing		
Minimum	593 mm	23.3 in
Maximum	604 mm	23.8 in
Penetration Force	142 kN	31,922.9 lbf
Pryout Force	182 kN	40,915.2 lbf

## Weights – Tier 4 Final/Stage V

Gross Vehicle Weight – Typically Equipped		
Total	74 985 kg	165,314 lb
Gross Vehicle Weight – Base		
Total	71 932 kg	158,583 lb
Gross Vehicle Weight – Maximum Tested		
Total	79 000 kg	174,165 lb

- For machines not equipped with Tier 4 Final emission engine, subtract 40 kg (88.2 lb) from the total weight. Typically equipped operating weight is calculated with a full fuel tank, coolant, lubricants, operator, 29.5R29 tires, 7.3 m (24 ft) moldboard and other commonly ordered items.

## Weights – U.S. EPA Tier 3 Equivalent

Gross Vehicle Weight – Typically Equipped		
Total	74 985 kg	165,314 lb

## Standards

ROPS	ISO 3471:2008
FOPS	ISO 3449:2005 Level II
Brakes	ISO 3450:2011
Steering	ISO 5010:2019

## Sound Standards

Sound	ISO 6395:2008
	ISO 6396:2008
<b>Spectator Sound Level, Tier 4 Final/Stage IV</b>	
Sound suppression equipped	113 dB(A)
Non-sound suppressed	115 dB(A)
<b>Spectator Sound Level, U.S. EPA Tier 3 Equivalent</b>	
Sound suppression equipped	111 dB(A)
Non-sound suppressed	113 dB(A)
Operator Sound Level	73 dB(A)

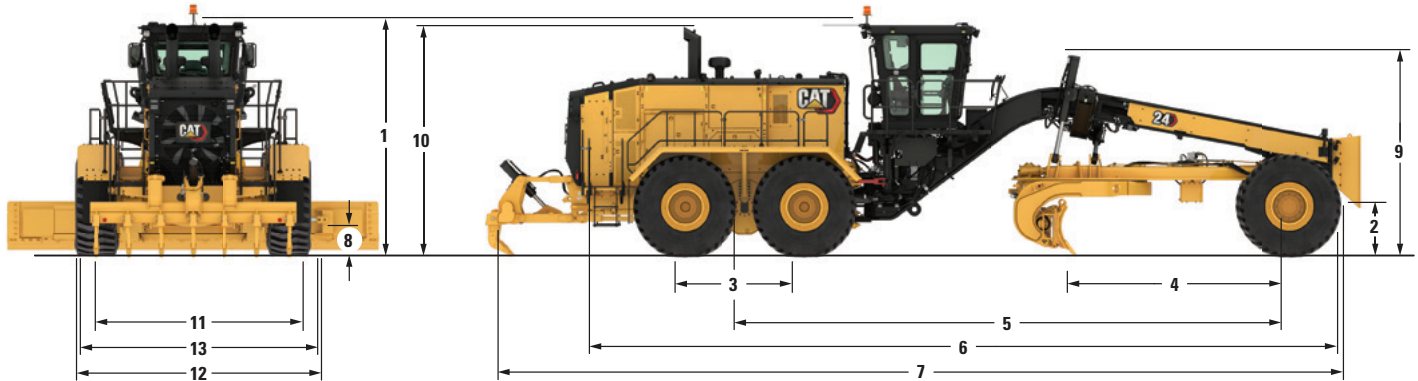
- The dynamic spectator sound power level is measured according to the test procedures that are specified in ISO 6395:2008. The measurement was conducted at 70% of the maximum engine cooling fan speed.
- The dynamic operator sound pressure level is for all engine emission options and all sound suppression options. It is measured according to the test procedures that are specified in ISO 6396:2008. The measurement was conducted at 70% of the maximum engine cooling fan speed, with the cab doors and the cab windows closed. The cab was properly installed and maintained.

## Air Conditioning

The air conditioning system on this machine contains the fluorinated greenhouse gas refrigerant R134a (Global Warning Potential = 1430). The system contains 1.6 kg of refrigerant which has a CO<sub>2</sub> equivalent of 2.288 metric tonnes.

# 24 Motor Grader Specifications

## Dimensions



24

	mm	in
1 Height – Top of Cab	4380	172.4
2 Height – Front Axle Center	914	36
3 Length – Between Tandem Axles	2285	90
4 Length – Front Axle to Moldboard	4048	159.4
5 Length – Front Axle to Mid Tandem	10 388	409
6 Length – Front Tire to Rear of Machine (includes tow hitch)	14 880	585.8
7 Length – Counterweight to Ripper	16 707	657.8
8 Ground Clearance at Rear Axle	404	15.9
9 Height to Top of Cylinders	3800	149.6
10 Height to Exhaust Stack	4373	172.2
11 Width – Tire Center Lines	3664	144.3
12 Width – Outside Rear Tires	4515	177.8
13 Width – Outside Front Tires	4507	177.5

All dimensions are approximate, based on standard machine configuration with 29.5R29 tires.

## Optional Tire Arrangements

Common tire options for the 24.

Wheel Group	Tires
29.5 × 29	29.5R29 Michelin XLDD2A ★ L5
29.5 × 29	29.5R29 Bridgestone VSTD D2A ★★ L5

Factory options may vary based on availability.

# 24 Motor Grader Standard and Optional Equipment

## Standard and Optional Equipment

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

	Standard	Optional		Standard	Optional
<b>POWER TRAIN</b>			<b>ELECTRICAL (continued)</b>		
Engine: C27	✓		Lights, reversing, stop, tail, turn	✓	
Aftercoolers, air-to-air	✓		LED operator access lighting package		✓
Air filters, dual with precleaner	✓		LED warning strobe light		✓
Automatic dust ejector	✓		Maintenance free batteries, 12V (4), 200 amp-hour	✓	
Automatic fan, suction with hydraulic demand	✓		Starter receptacle plug-in	✓	
Bar and plate dual core radiator		✓	Working halogen lighting package		✓
Cold weather package – arctic hydraulic oil, engine, hydraulic, transmission and coolant heater (240V/30A)		✓	Working LED lighting package		✓
Control blade variable float		✓	<b>OPERATOR ENVIRONMENT</b>		
Differential, lock/unlock (auto/manual)	✓		Adjustable armrest	✓	
Directional shift management	✓		Air conditioner and heater sound suppressed, pressurized cab 73 dB(A) ISO 6394:2008 at 70 percent fan speed	✓	
Drive, near zero fan speed	✓		Air horn		✓
Electric start, 24-volt	✓		Auto articulation		✓
Electronic prescreener water/fuel	✓		Automatic return to center articulation	✓	
Enhanced auto-shift, APECS	✓		Coat hook	✓	
Ether starting aid	✓		Comfort suspension seat, cloth-covered	✓	
Fast fill (fuel, hydraulic, transmission, coolant)	✓		Electro-hydraulic controls	✓	
Fluid monitoring (engine, transmission, hydraulic, differential)	✓		Electronic throttle control	✓	
Fuel priming pump, electric	✓		Front fixed laminated window glass with intermittent wiper, sides (two), rear with wiper/washer	✓	
Parking brake, multi-disc, sealed and oil cooled	✓		Heated and ventilated seat		✓
Pre-cleaner Sy-klone		✓	Heated outside mounted mirrors 24V		✓
Prescreener separator, water/fuel	✓		Heated seat		✓
Thermal shields	✓		Hydraulic implement lockout for roading and servicing	✓	
Torque divider, lock-up	✓		Outside mounted mirrors		✓
Transmission, 533 mm (21 in) planetary powershift with 6F/3R, ECPC	✓		Radio Bluetooth®		✓
<b>ELECTRICAL</b>			Radio Satellite Sirius		✓
Alarm, back-up	✓		Rear view camera additional dedicated monitor	✓	
Alternator, 150 ampere, sealed, filtered air intake	✓		Rear vision camera	✓	
Electrical hydraulic valves, base 8	✓		Retractable seat belt, 76 mm (3 in)	✓	
Electrical system, 24 volt	✓		Rollover protective structure (ROPS/FOPS)	✓	
Halogen operator access lighting package		✓	10-inch digital touchscreen information display	✓	
Heavy duty starter (two)	✓				

(continued on next page)

# 24 Motor Grader Standard and Optional Equipment

## Standard and Optional Equipment (continued)

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

	Standard	Optional		Standard	Optional
<b>TECHNOLOGY</b>			<b>GUARDS</b>		
Circle angle limits	✓		Guard Package, including mud guard (two) bottom, engine compartment, and front axle (two)		✓
Cat Grade with Cross Slope	✓		Hydraulic and electric bulkheads		✓
Overspeed/underspeed protection	✓		Sound suppression guard package		✓
Ripper auto stow	✓		Tandem fenders with mounted guardrails		✓
Second generation steering system	✓		Transmission guard	✓	
Product Link™		✓	<b>OTHER STANDARD EQUIPMENT</b>		
<b>SAFETY AND SECURITY</b>			Blade lift accumulators	✓	
Circle drive slip clutch	✓		Fluid service center: engine, transmission, hydraulic oil, and coolant ports	✓	
Dual access cab platform		✓	Fuel tank, 908 L (240 gal) fast fill	✓	
Fire suppression ready	✓		Ground level fueling	✓	
Fire suppression system		✓	Hydraulic and electric bulkheads	✓	
Front facing cameras (two)		✓	Lincoln Centro-Matic Autolube System	✓	
Ground level engine shutdown	✓		Push plate-counterweight	✓	
Locking doors	✓		Scheduled Oil Sampling (S·O·S <sup>SM</sup> ) ports, engine, hydraulic, transmission, coolant, fuel	✓	
Rear tandem access platforms	✓		<b>ATTACHMENTS</b>		
Seat belt indicator	✓		Rims only option, 25" × 29" MP		✓
Secondary steering	✓		Rear ripper with seven shank capacity, three shanks/tips provided	✓	
Wheel chocks with mounting bracket		✓	Additional ripper shanks		✓
Working at heights tie-off anchors	✓				
<b>DRAWBAR CIRCLE MOLDBOARD</b>					
Flat 406 mm × 60 mm (16 in × 2.36 in) cutting edge		✓			
MiningBits 357 mm × 75 mm (14 in × 2.13 in) cutting edge system		✓			
Moldboard, 7315 mm × 1067 mm × 50 mm (24 ft × 42 in × 2 in)	✓				
Moldboard, 8534 mm × 1067 mm × 50 mm (28 ft × 42 in × 2 in)		✓			
Serrated 406 mm × 75 mm (16 in × 2.95 in) cutting edge		✓			
High performance circle	✓				

# 24 Environmental Declaration

The following information applies to the machine at the time of final manufacture as configured for sale in the regions covered in this document. The content of this declaration is valid as of the date issued; however, content related to machine features and specifications are subject to change without notice. For additional information, please see the machine's Operation and Maintenance Manual.

For more information on sustainability in action and our progress, please visit <https://www.caterpillar.com/en/company/sustainability>.

## Engine

- The Cat C27 VHP engine is available in configurations that meet U.S. EPA Tier 4 Final and EU Stage V emission standards, or equivalent to U.S. EPA Tier 3 or U.S. EPA Tier 2 and EU Stage II.
- Cat C27 VHP Tier 4 Final and EU Stage V diesel engines are required to use ULSD (ultra-low sulfur diesel fuel with 15 ppm of sulfur or less) or ULSD blended with the following lower-carbon intensity fuels up to:
  - ✓ 100% renewable diesel, HVO (hydrotreated vegetable oil) and GTL (gas-to-liquid) fuels
- Cat engines equivalent to U.S. EPA Tier 3 or U.S. EPA Tier 2 and EU Stage II, are compatible with diesel fuel blended with the following lower-carbon intensity fuels up to:
  - ✓ 100% biodiesel FAME (fatty acid methyl ester)\*\*
  - ✓ 100% renewable diesel, HVO (hydrotreated vegetable oil) and GTL (gas-to-liquid) fuels

Refer to guidelines for successful application. Please consult your Cat dealer or "Caterpillar Machine Fluids Recommendations" (SEBU6250) for details.

*\*For use of blends higher than 20% biodiesel, consult your Cat dealer.*

## Air Conditioning System

- The air conditioning system on this machine contains the fluorinated greenhouse gas refrigerant R134a (Global Warming Potential = 1430). The system contains 1.6 kg (3.5 lb) of refrigerant which has a CO<sub>2</sub> equivalent of 2.288 metric tonnes (2.522 tons).

## Paint

- Based on best available knowledge, the maximum allowable concentration, measured in parts per million (PPM), of the following heavy metals in paint are:
  - Barium < 0.01%
  - Cadmium < 0.01%
  - Chromium < 0.01%
  - Lead < 0.01%

## Sound Performance

With cooling fan speed at maximum value:

Operator Sound Pressure Level (ISO 6396:2008) – 73 dB(A)

Exterior Sound Power Level (ISO 6395:2008) – 113 dB(A)

- The dynamic spectator sound power level is measured according to the test procedures that are specified in ISO 6395:2008. The measurement was conducted at 70% of the maximum engine cooling fan speed.
- The dynamic operator sound pressure level is for all engine emission options and all sound suppression options. It is measured according to the test procedures that are specified in ISO 6396:2008. The measurement was conducted at 70% of the maximum engine cooling fan speed, with the cab doors and the cab windows closed. The cab was properly installed and maintained.

## Oils and Fluids

- Caterpillar factory fills with ethylene glycol coolants. Cat Diesel Engine Antifreeze/Coolant (DEAC) and Cat Extended Life Coolant (ELC) can be recycled. Consult your Cat dealer for more information.
- Cat Bio HYDO™ Advanced is an EU Ecolabel approved biodegradable hydraulic oil.
- Additional fluids are likely to be present, please consult the Operations and Maintenance Manual or the Application and Installation guide for complete fluid recommendations and maintenance intervals.

## Features and Technology

- The following features and technology may contribute to fuel savings and/or carbon reduction. Features may vary. Consult your Cat dealer for details.
  - ECO mode minimizes fuel consumption for light applications
  - Engine Idle Shutdown Timer reduces fuel burn, greenhouse gas emissions and unnecessary idle time by shutting down the machine after a pre-set idling period
  - Improve productivity with the Electronic Throttle Control which matches engine power and torque to application requirements
  - Cat Grade helps reduce fuel burn and greenhouse gas emissions by enabling you to achieve grade faster and more accurately by automating blade actions
  - Extended maintenance intervals not only reduce downtime but decrease the amount of fluid and filters that are replaced over the life of the machine
  - Improve jobsite efficiency with lower operating costs with Product Link™ and VisionLink® insights



For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at [www.cat.com](http://www.cat.com)

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

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