

24

Motor Grader



The Cat® 24 Motor Grader continues the Caterpillar tradition of being the industry leader in enabling you to build and maintain your haul roads to maximize your mine-site productivity and lower your owning and operating costs. The 24 motor grader is designed to help you get more work done in less time while keeping you safe and comfortable.

Serviceability

- The improved power train rebuild life, new modular design and new machine protection features can save you up to 2,400 servicing hours over the life of the machine.*
- Cat C27 ACERT™ engine, 533 mm (21 in) transmission and lower power train provide 33 percent additional machine life before needing to be rebuilt.**
- New, innovative main component modular design means they can be removed and installed quicker and easier. Transmission and cooling package can be removed up to 70 percent faster than the 24M.
- Fluid Service Center provides single location at ground level for access to engine, transmission, hydraulic oil and coolant. This feature, along with clustered filters and extended service intervals, saves you maintenance time and operating costs.
- Hoses and electrical harnesses are split at easily accessible bulkhead locations allowing your service technicians to work with smaller sections easier and faster.
- Ok-to-Start and Critically Low Fluid monitoring systems protect your machine by providing electronic verification of fluid levels and alerting you when low fluid levels are detected, protecting your machine.

Performance

- Cat C27 ACERT engine provides enhanced altitude capabilities with no derate up to 3048 m (10,000 ft) for U.S. EPA Tier 4/EU Stage IV emission standards and 4572 m (15,000 ft) for equivalent Tier 2/Stage II emissions.
- An 11 percent weight increase helps provide more traction and blade down pressure than the 24M.
- Consistent Power-to-the-Ground changes real-time engine power levels to offset cooling fan losses resulting in best performance at all times independent of ambient conditions.

Safety

- Fifteen tie-off points located around engine enclosure and cab provide secure tie off hooks protecting you and your technicians when performing service operations.
- Optional Working at Heights package adds an extra layer of safety by providing handrails and hand holds to improve access and safety.
- The 24 is a Fire Suppression-Ready machine which means you can easily install a fire suppression system to further protect your investment.
- Standard rearview camera provides better visibility from the cab to behind the machine while optional front-facing cameras provide enhanced forward and side visibility.
- Standard seat belt indicator provides visual/audible alerts when the seat belt is not in use. The 24 is pre-wired so you can easily install a beacon on top of the cab to indicate seat belt usage.

Technology

- The 24 features asset protection and performance-improving technologies including: engine overspeed/underspeed, second generation steering system, articulation eStop, ripper auto stow, implements lock out and circle angle limits, to name a few.
- Standard Cat GRADE with Cross Slope improves operator productivity and haul road quality and durability by helping maintain desired cross slope for appropriate water drainage by automatically controlling one side of the blade.
- The Cat 24 is MineStar™ ready and includes Cat Product Link™ Elite and VIMS™ to help optimize equipment management, remote monitoring capabilities, machine availability and component life while reducing both repair cost and the risk of a catastrophic failure.

*Life assumed is 64,000 hours.

**24 power train rebuild life target is 16,000 hours.



24 Motor Grader Specifications

Engine

Engine Model	Cat C27 ACERT	
Emissions	Tier 4 Final/Stage IV Tier 2/Stage II	
Base Power (1st gear) – Net	399 kW	535 hp
Base Power (1st gear) – Net (Metric)	543 hp	
Displacement	27.0 L	1,649.5 in ³
Bore	137.2 mm	5.4 in
Stroke	152.4 mm	6
Torque Rise ISO 9249	19%	
Maximum Torque ISO 9249	3277 N·m	2,417 lbf-ft
Speed @ Rated Power	1,800 rpm	
Number of Cylinders	12	
Derating Altitude		
Tier 4 Final/Stage IV	3048 m	10,000 ft
Tier 2/Stage II	4572 m	15,000 ft
Standard – Fan Speed		
Maximum	1,330 rpm	
Minimum	50 rpm	
Standard Capability	50° C	122° F

- The 24 is offered with two variations of the C27 Engine with ACERT Technology. One meets U.S. EPA Tier 4 Final/EU Stage IV emission standards and is required for higher regulated countries. The other option is capable of meeting Tier 2/Stage II emission standards and is available for lesser regulated countries.
- On Tier 4/Stage IV machines, Ultra Low Sulfur Diesel (ULSD) and lower ash oil are required.

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 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	24 150 kPa	3,500 psi
Standby Pressure	5800 kPa	841.2 psi

- Pump output measured at 1,800 rpm.

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.

24 Motor Grader Specifications

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

Frame

Circle		
Diameter	2631 mm	103.6 in
Blade Beam Thickness	160 mm	6.3 in
Drawbar		
Height	215 mm	8.5 in
Thickness	16 mm	0.6 in
Width	225 mm	8.9 in
Front-Top/Bottom Plate		
Width	514 mm	20.2 in
Thickness	50 mm	2 in
Front Side Plates		
Width	415 mm	16.3 in
Thickness	25 mm	1 in
Front Axle		
Height to Center	882 mm	34.7 in
Wheel Lean, Left/Right	18 degrees	
Total Oscillation Per Side	32 degrees	

Tandems

Height	1040 mm	41 in
Width	353 mm	13.9 in
Sidewall Thickness		
Inner	25 mm	1 in
Outer	30 mm	1.2 in
Drive Chain Pitch	76 mm	3 in
Wheel Axle Spacing	2285 mm	90 in
Tandem Oscillation		
Front Up	20 degrees	
Front Down	20 degrees	

Moldboard

Width	7.3 m	24 ft
Height	1025 mm	42.4 in
Thickness	50 mm	2 in
Arc Radius	550 mm	21.7 in
Throat Clearance	162 mm	6.4 in
Cutting Edge		
Width	406 mm	16 in
Thickness	60 mm	2.4 in
End Bit		
Width	203 mm	8 in
Thickness	25 mm	1 in
Blade Pull*		
Base GVW	64 406 kg	141,992 lb
Maximum GVW	67 186 kg	148,121 lb
Down Force		
Base GVW	32 597 kg	71,863 lb
Maximum GVW	34 020 kg	75,001 lb

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

Blade Range

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	55 degrees	
Blade Tip Range		
Forward	40 degrees	
Backward	0 degrees	
Maximum Shoulder Reach Outside of Tires		
Right	3175 mm	125 in
Left	3175 mm	125 in
Maximum Lift Above Ground	410 mm	16.1 in
Maximum Depth of Cut	550 mm	21.7 in

• Maximum lift above ground and depth of cut with 406 mm × 60 mm (16 in × 2.4 in) cutting edges.

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/Stage IV

Gross Vehicle Weight – Typically Equipped		
Total	73 344 kg	161,695 lb
Front Axle	20 170 kg	44,467 lb
Rear Axle	53 174 kg	117,228 lb
Gross Vehicle Weight – Base*		
Total	71 563 kg	157,769 lb
Front Axle	19 894 kg	43,858 lb
Rear Axle	51 669 kg	113,910 lb
Gross Vehicle Weight – Maximum Tested		
Total	75 500 kg	166,449 lb
Front Axle	20 763 kg	45,775 lb
Rear Axle	54 737 kg	120,674 lb

*For machines not equipped with Tier 4 Final emission engine, subtract 40 kg (88.2 lb) from the rear axle weight and total weight. Base operating weight calculated on standard machine configuration with 29.5 R29 tires, full fuel tank operator and ROPS cab.

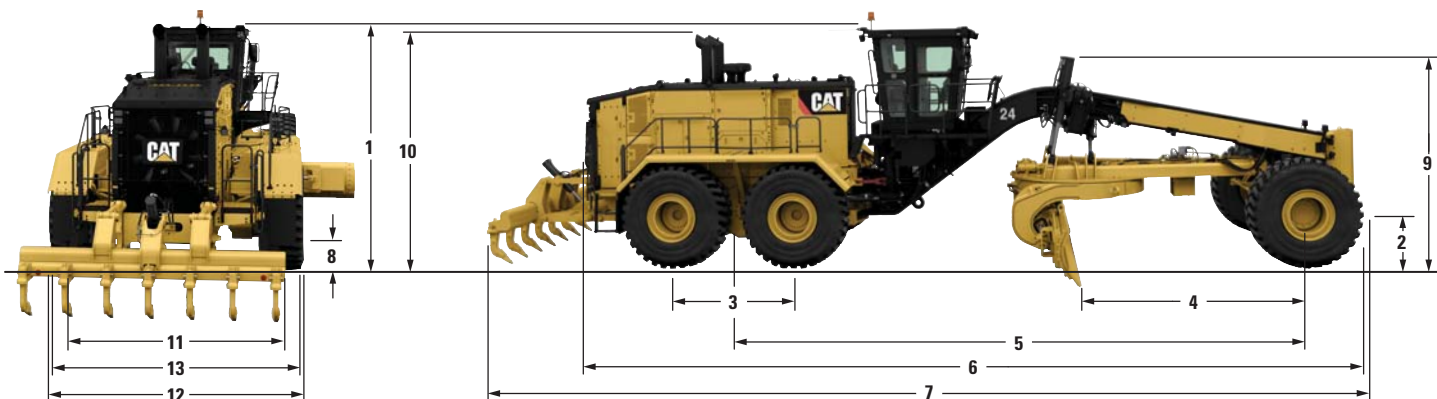
Standards

ROPS/FOPS	ISO 3471, ISO 3499
Steering	ISO 5010:2007
Brakes	ISO 3450
Sound	ISO 6394, ISO 6395, ISO 6396

- The dynamic spectator sound power level is 112 dB(A) for Tier 4/ Stage IV certified configurations and 113 dB(A) for Tier 2/Stage II emission standard machines when measured according to the dynamic test procedures that are specified in ISO 6395:2008. The measurement was conducted at 70 percent of the maximum engine cooling fan speed. The machine was equipped with a sound suppression system.
- The dynamic operator sound pressure level is 77 dB(A) for Tier 4/ Stage IV certified configurations and 73 dB(A) for Tier 2/Stage II emission standard machines when measured according to the dynamic test procedures that are specified in ISO 6396:2008. The measurement was conducted at 70 percent of the maximum engine cooling fan speed, with the cab doors and the cab windows closed. The cab was properly installed and maintained. The machine was equipped with a sound suppression system.

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	4433	174.5
13 Width – Outside Front Tires	4280	168.5

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 Equipment

Standard Equipment

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

POWER TRAIN

- Engine: C27 with ACERT technology
- 24-volt electric start
- Air filters, dual with precleaner
- Automatic dust ejector
- Aftercoolers, air-to-air
- Ether starting aid
- Automatic fan, suction with hydraulic demand
- Drive, near zero fan speed
- Torque divider, lock-up
- Transmission, 533 mm (21 in) planetary powershift with 6F/3R, ECPC
- Enhanced auto-shift, APECS
- Directional shift management
- Differential, lock/unlock (auto/manual)
- Parking brake, multi-disc, sealed and oil cooled
- Fast fill (fuel, hydraulic, transmission, coolant)
- Fuel priming pump, electric
- Electronic prescreener water/fuel
- Prescreener separator, water/fuel
- Thermal shields
- Fluid monitoring (engine, transmission, hydraulic, differential)

ELECTRICAL

- Alarm, back-up
- Alternator, 150 ampere, sealed, filtered air intake
- Maintenance free batteries, 12V (4), 200 amp-hour
- Heavy duty starter (two)
- Electrical hydraulic valves, base 8
- Electrical system, 24 volt
- Lights, reversing, stop, tail, turn
- Starter receptacle plug-in

OPERATOR ENVIRONMENT

- Air conditioner and heater sound suppressed, pressurized cab 73 dB(A) ISO 6394 at 70 percent fan speed.
- Rollover protective structure (ROPS/FOPS)
- Adjustable armrest
- Electro-hydraulic controls
- Electronic throttle control
- Automatic return to center articulation
- 10 inch digital touch screen information display
- Rear vision camera
- Coat hook
- Comfort suspension seat, cloth-covered
- Front fixed laminated window glass with intermittent wiper, sides (two), rear with wiper/washer
- Retractable seat belt, 76 mm (3 in)
- Hydraulic implement lockout for roading and servicing

TECHNOLOGY PRODUCTS

- VIMS – 3G
- Grade control X slope
- Overspeed/underspeed protection
- Second generation steering system
- Ripper auto stow
- Circle angle limits

SAFETY AND SECURITY

- Fire suppression ready
- Circle drive slip clutch
- Locking doors
- Ground level engine shutdown
- Secondary steering
- Working at heights tie-off anchors
- Rear tandem access platforms
- Seat belt indicator

GROUND ENGAGING TOOLS

- Moldboard, 7315 mm × 1067 mm × 50 mm (24 ft × 42 in × 2 in)
- Rear ripper with seven shank capacity, three shanks/tips provided

OTHER STANDARD EQUIPMENT

- Blade lift accumulators
- Lincoln Centro-Matic Autolube System
- Drawbar, eight shoe with replaceable wear strips
- Fuel tank, 908 L (240 gal) fast fill
- Ground level fueling
- Push plate-counterweight
- S·O·SSM ports, engine, hydraulic, transmission, coolant, fuel
- Hydraulic and electric bulkheads
- Fluid service center: engine, transmission, hydraulic oil, and coolant ports

Optional Equipment

Optional equipment may vary. Consult your Cat dealer for details.

OPERATOR ENVIRONMENT

- Heated seat
- Heated and ventilated seat
- Air horn
- Radio Bluetooth®
- Radio Satellite Sirius
- Outside mounted mirrors
- Heated outside mounted mirrors 24V
- Rear view camera additional dedicated monitor
- Auto articulation

POWER TRAIN

- Bar and plate dual core radiator
- Precleaner Sy-klone
- Control bade variable float

GUARDS

- Guard Package including mud guard (two) bottom, eng. compartment and front axle (two)
- Tandem fenders with mounted guardrails
- Sound suppression guard package

ELECTRICAL

- Halogen operator access lighting package
- LED operator access lighting package
- Working halogen lighting package
- Working LED lighting package
- LED warning strobe light

SAFETY

- Dual Access CAB platform
- Front facing cameras (two)
- Fire suppression system
- Wheel chocks with mounting bracket

OTHER ATTACHMENTS

- VIMS and Satellite Product Link
- VIMS and Dual (Cell/Satellite) Product Link
- Rims Only option , 25" × 29" MP

WORK TOOLS/G.E.T.

- Flat 406 mm × 60 mm (16 in × 2.36 in) cutting edge
- Serrated 406 mm × 75 mm (16 in × 2.95 in) cutting edge
- Miningbit™ 355.6 mm × 75 mm (14 in × 2.13 in) cutting edge system
- Tooth, ripper

FLUIDS

- Cold Weather Package – Arctic hydraulic oil, engine, hydraulic, transmission and coolant heater (240V/30A)

24 Motor Grader

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