



12G

MOTOR GRADER

- **Reliable/Durable** — built to withstand the toughest working conditions.
- **Operating Ease** — effortless power shifting, precise blade controls, and exceptional maneuverability for all-around production.
- **Low Operating Cost** — highly efficient, long-life components.
- **Operator Comfort and Convenience** — efficient, productive work environment.
- **Total Customer Support System** — unmatched in the industry.

Cat 3306 diesel Engine

Gross Power111 kW/149 HP

Flywheel Power101 kW/135 HP

Moldboard3658 mm/12 ft

*Operating weight up to15 173 kg/33,450 lb

* Ripper, pushplate, 14' x 24" blade and 14.00 - 24" tires with 10" rims
Machine shown may include optional equipment.



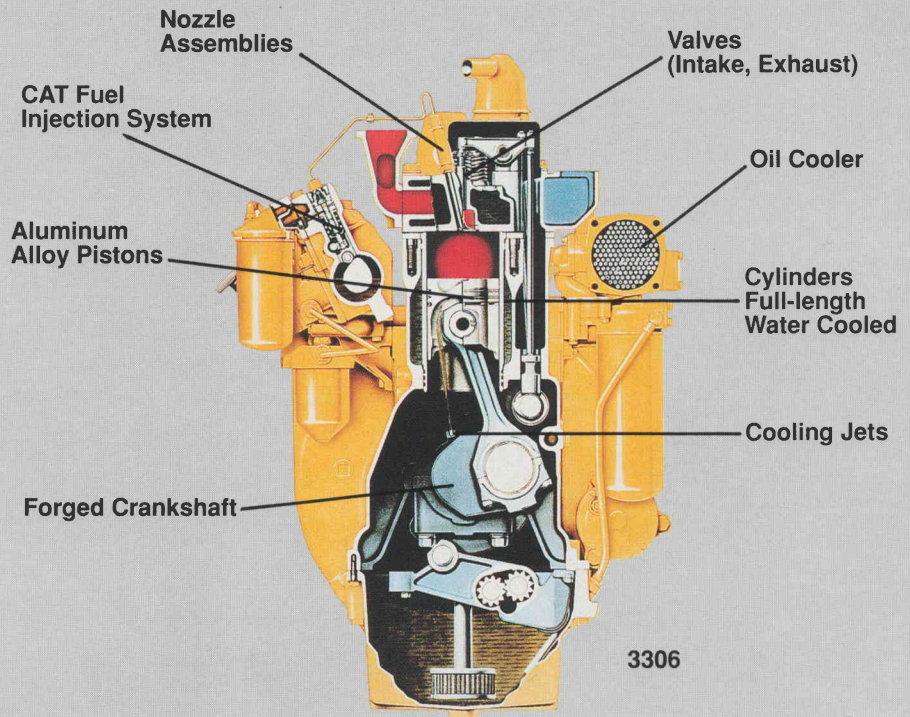
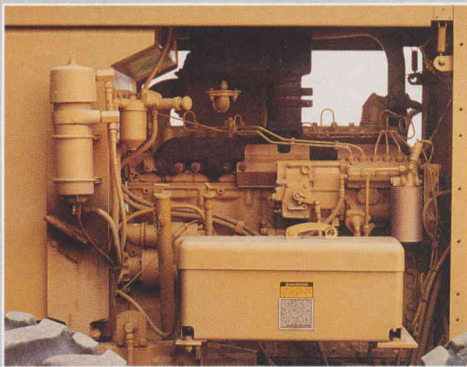
FEATURES

Caterpillar Power Train

Designed for durability and efficiency.

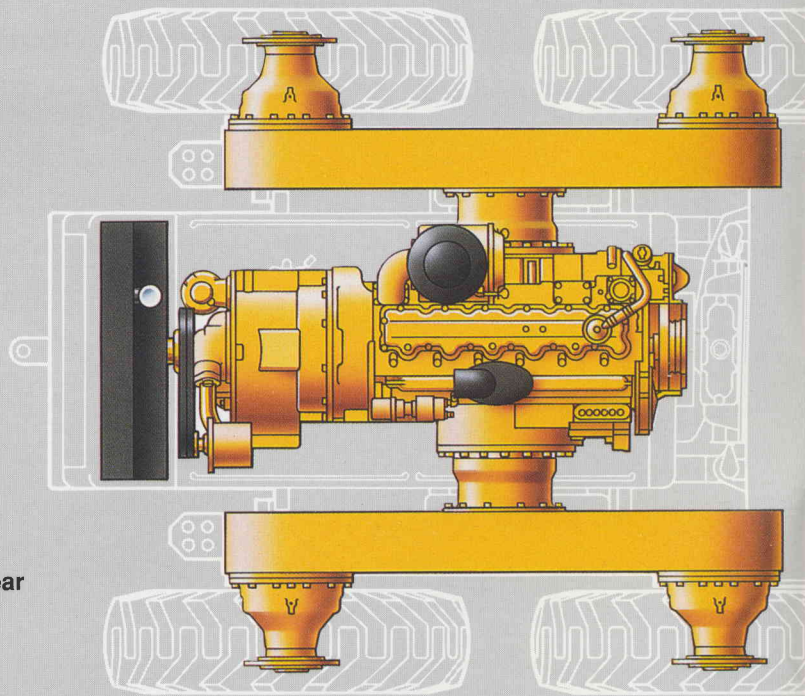
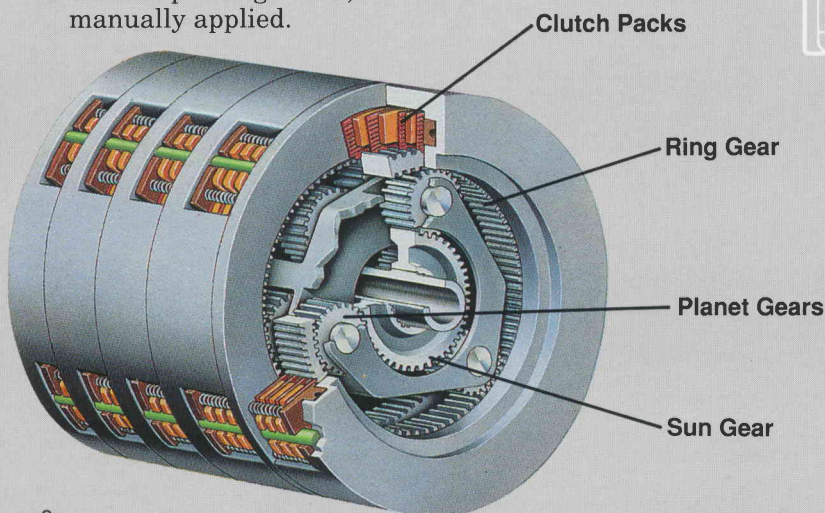
Cat Diesel Engine... Caterpillar four-stroke cycle engines blend power and efficiency.

- Long effective power strokes... more complete fuel combustion.
- Direct-injection fuel system for efficient, precise fuel metering.
- Engine flywheel faces rearward, sending transmission noise and vibration away from the operator.



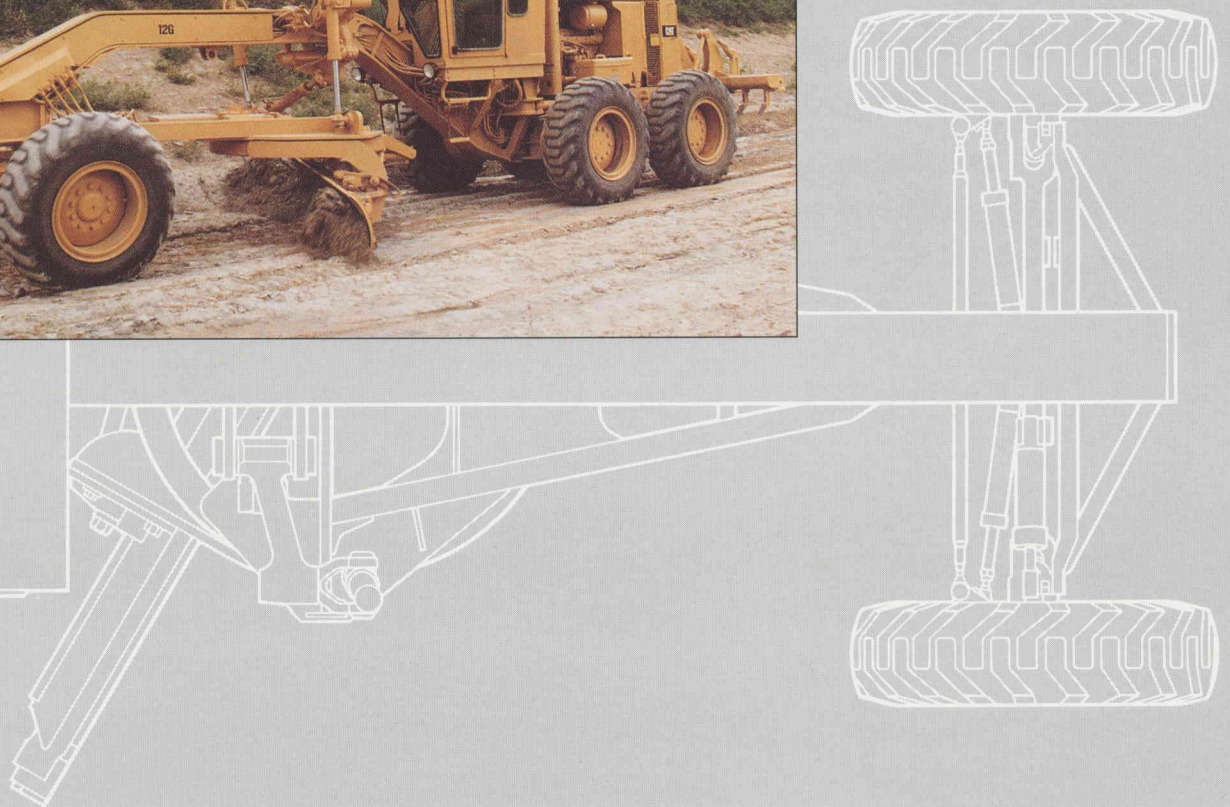
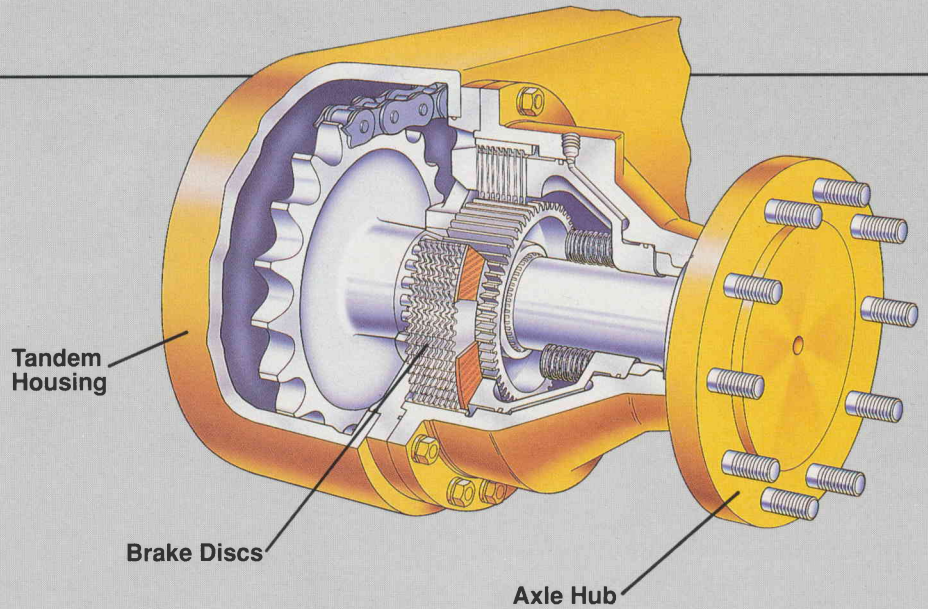
Direct-Drive, Power Shift Transmission... designed specifically for motor graders.

- The feel and efficiency of direct drive.
- Easy on-the-go shifting up or down, forward or reverse.
- Clutch plates are continuously lubricated and cooled by oil.
- Oil-disc parking brake, manually applied.



Oil Disc Brakes...Protection for man and machine.

- Confident, fade resistant braking with full air actuation.
- Completely sealed and adjustment free.
- Outboard mounted to prevent drive line stress...easy to service.
- Disc face grooves constantly carry oil between the plates and discs, even when fully applied.
- Each tandem has an independent air circuit, so failure in one line still leaves half braking capacity.



FEATURES

Hydraulic System

Fast hydraulic blade controls...precise action at any speed.

Low Effort Control

- Controls can be positioned to fit each operator's need.
- Fingertip response are clustered so a single hand can actuate two or more when needed.
- Short throws and modulation gives precise hydraulic implement movement (38.1 mm/1.5" front to back range).
- O-ring face seals used on all fittings for a "dry machine".



Left Blade Lift

Moldboard Side Shift

Blade Tip

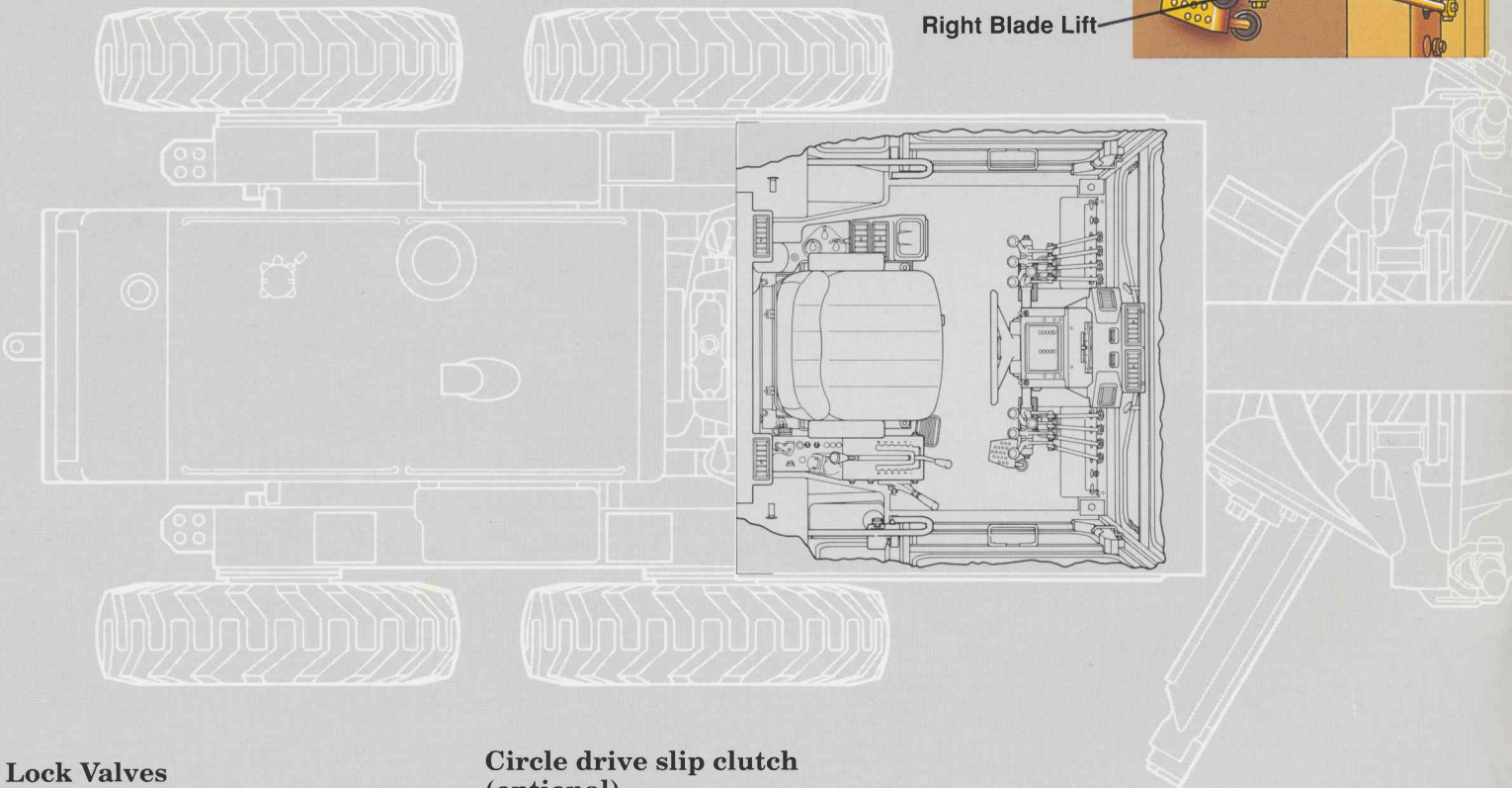
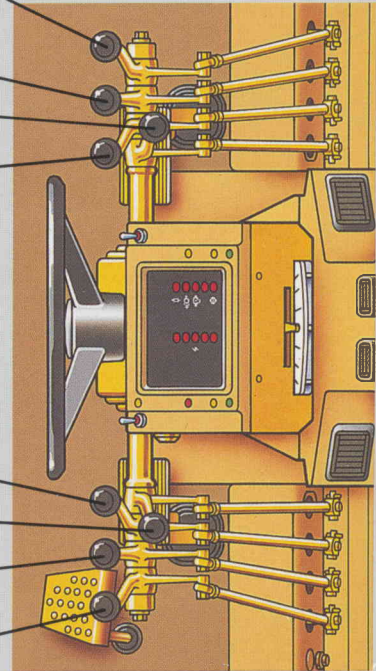
Circle Reverse

Drawbar Center Shift

Articulation

Wheel Lean

Right Blade Lift



Lock Valves

- In every implement hydraulic circuit...minimizes blade creep and drift.
- Positive hold at each blade setting, for precise finish grading.

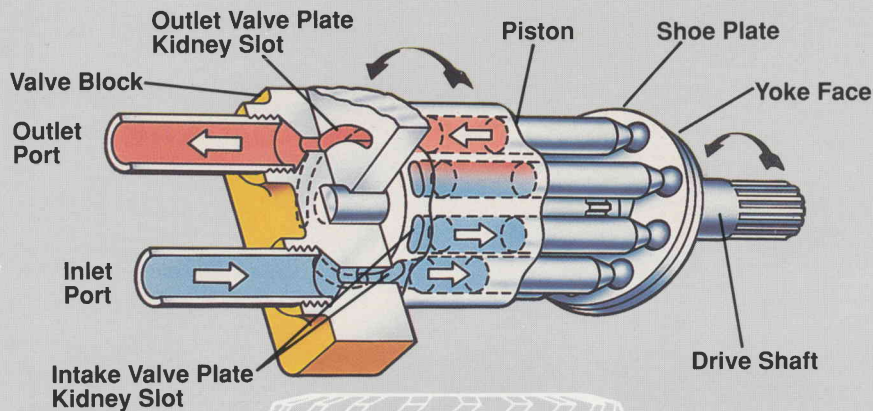
Circle drive slip clutch (optional)

- Shock protection for the circle, drawbar assembly, circle drive and moldboard.
- Housed in sturdy cast iron, run in oil and sealed with Duo-Cone seals.

- Rarely needs adjustment. Top access cover permits quick and easy adjustment if required.

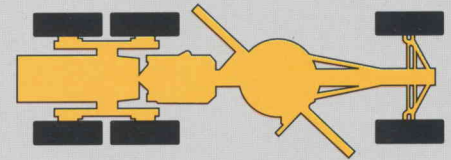
Load Sensing Hydraulic System

- Automatically shifts to 2067 kPa/ 21 bar / **300 psi** higher than working pressure.
- Continuously adjusted up to 24 115 kPa/241 bar / **3500 psi** maximum when required.
- Automatically matches flow and pressure requirements (load sensing) for improved fuel economy and precisely matched horsepower demands.



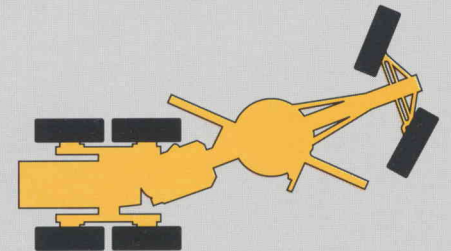
Maneuverability

Three excellent maneuvering modes...for best job match. An important production advantage over conventional motor grader design.



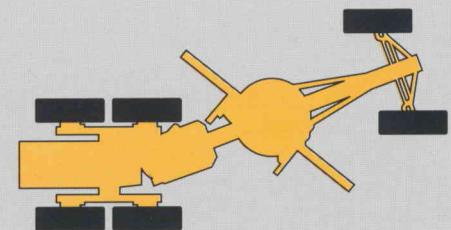
Straight Frame

- Frame centered, front wheels turn for steering.
- Best for long-pass grading.



Articulated Turn

- 20° frame articulation.
- 50° front wheel steering angle.
- 18° wheel lean.
- Easier maneuvering in close quarters, quicker turn-around at the end of a pass.



Crab Steering

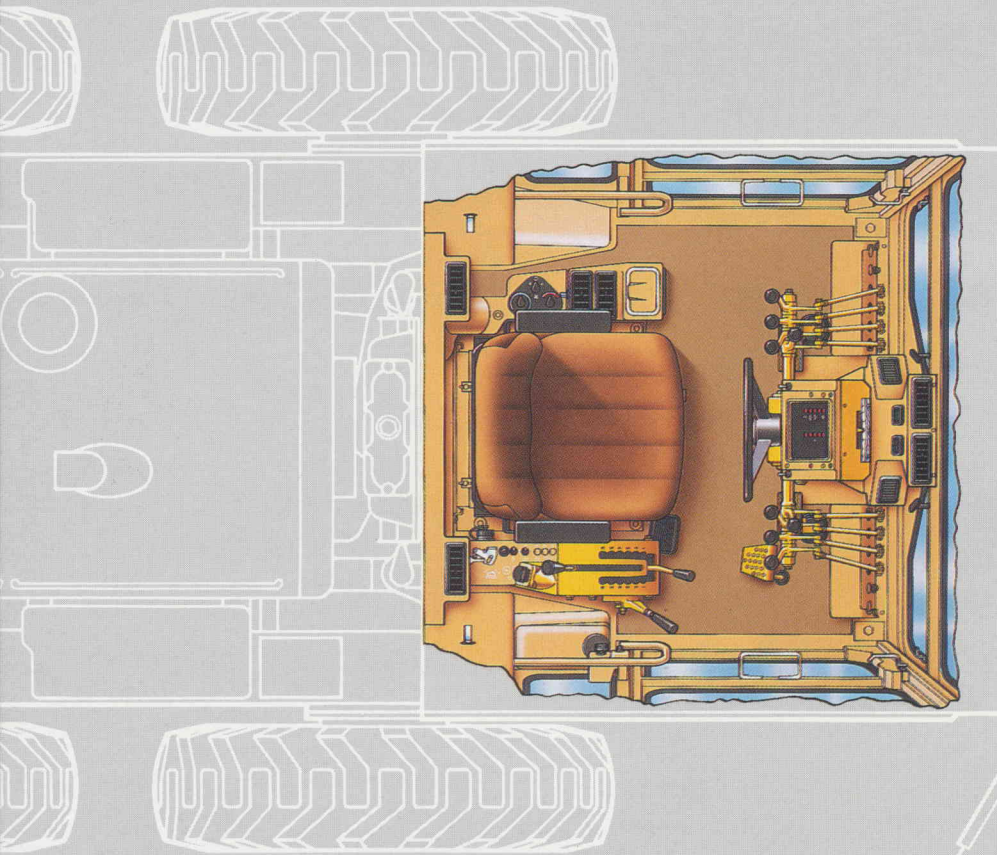
- Compensates for side drift when turning a windrow.
- Keeps tandems on firm footing when cleaning a wet ditch.
- Increases stability, for sideslope work.

FEATURES

Operator's Station

Designed for sit-down operation the moment you climb aboard. Equipped for convenience, comfort and control — three keys to productivity.

- Excellent visibility to both ends of blade.
- Optional, fully adjustable suspension seat — the most comfortable position for each operator.
- Control console adjusts back and forth for each operator — comfortable sit-down operation, easy entry and exit.
- Blade control levers engage smoothly and crisply.
- Low or high profile, resiliently-mounted, sound-suppressed cab for reduced noise and vibration.
- Standard, static adjustable seat with cloth cushions (vinyl static adjustable seat provided with canopies).
- Cab slopes outward toward top to provide spacious working environment.
- Heavy gauge steel column assembly provides a sturdy, durable console.
- Belted steps provide easy, sure-footed access.



- **Electronic Monitoring System (EMS)** — shows status of important machine systems. Operator concentrates on production instead of watching gauges. Reduces the possibility of catastrophic failures and subsequent costly repair.

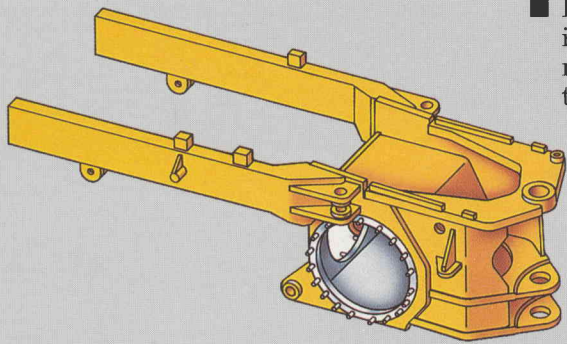
Level one — Alternator.
Level two — Engine coolant, Hydraulic oil temperature.
Level three — Engine oil pressure, Brake pressure.

Total Climate Systems

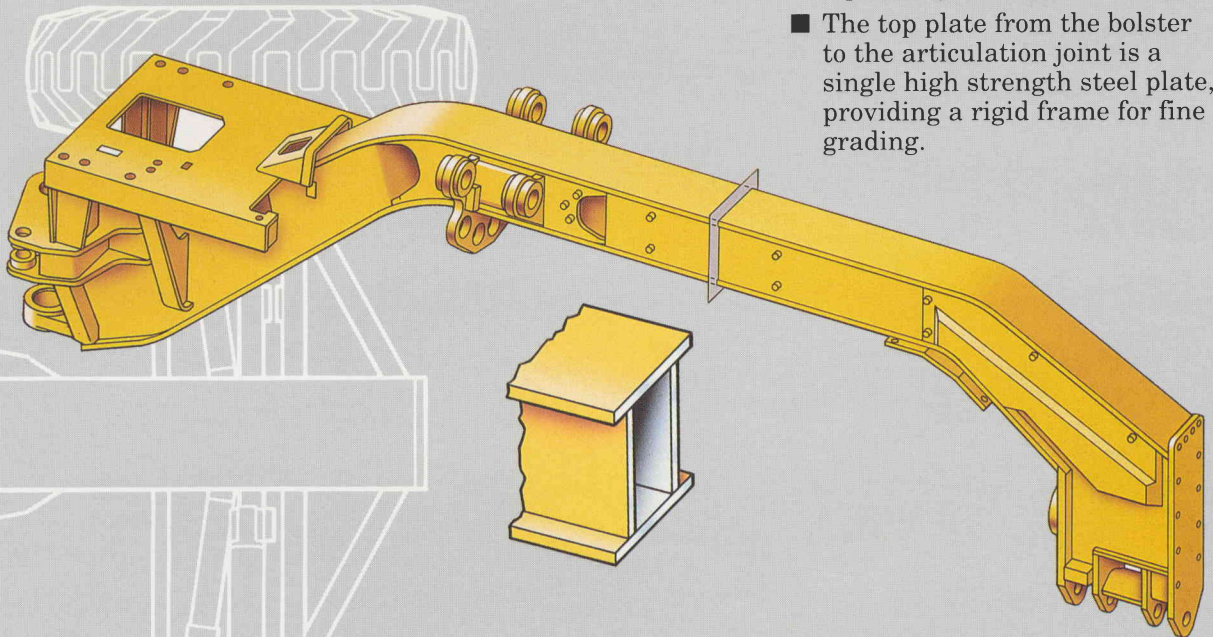
- **Air Conditions**...high capacity...cools and freshens hot, humid cab air.
- **Heats**...high capacity...protects against biting cold air in winter operation.
- **Dehumidifies**...removes excess moisture in the air down to 32°F (0°C). On hot, humid days, operator stays fresh and alert.

- **Pressurizes**...keeps air fresh, seals out dust. (Approximately one quarter of the total air flow is filtered outside air.)
- **Multiple ducting**...allows you to direct the air flow. More ducts, strategically placed, means more uniform temperature throughout the cab.
- Lower cab windows open to provide excellent ventilation.

Structure



- Differential housing is built into the frame, thus maintaining better alignment than a bolt-on unit.



- Double tapered roller bearings on the bottom of articulation joint are dependable and maintenance free.
- Box-section rear frame is connected to the case with steel castings.
- Side plates are welded to the top and bottom plates away from the edges resulting in a flanged box-section, giving a rigid, long lasting frame.
- The top plate from the bolster to the articulation joint is a single high strength steel plate, providing a rigid frame for fine grading.

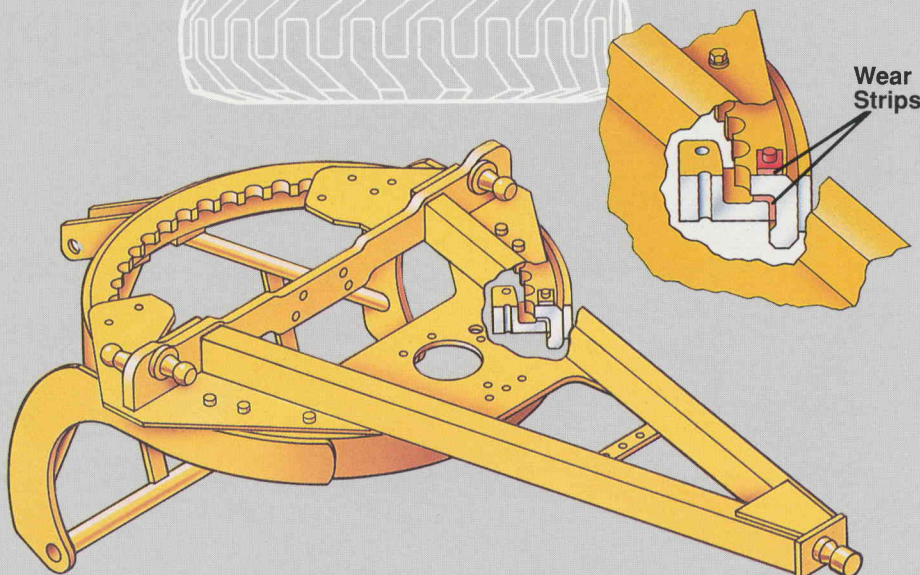
Drawbar/Circle...Built strong and durable for long life.

■ Drawbar

- Features a box-section, A-frame, for high strength.
- Machined to provide accurate adjustment and precision blading.

■ Circle

- One-piece forged circle with induction hardened flame cut teeth.
- Replaceable bronze-alloy wear strips between circle and drawbar, and support shoes and circle eliminate circle shoe grease fittings and extend wear life.



FEATURES

Serviceability

Less time spent on maintenance gives you more time on the job.

Outside-Mounted Hydraulic Valves

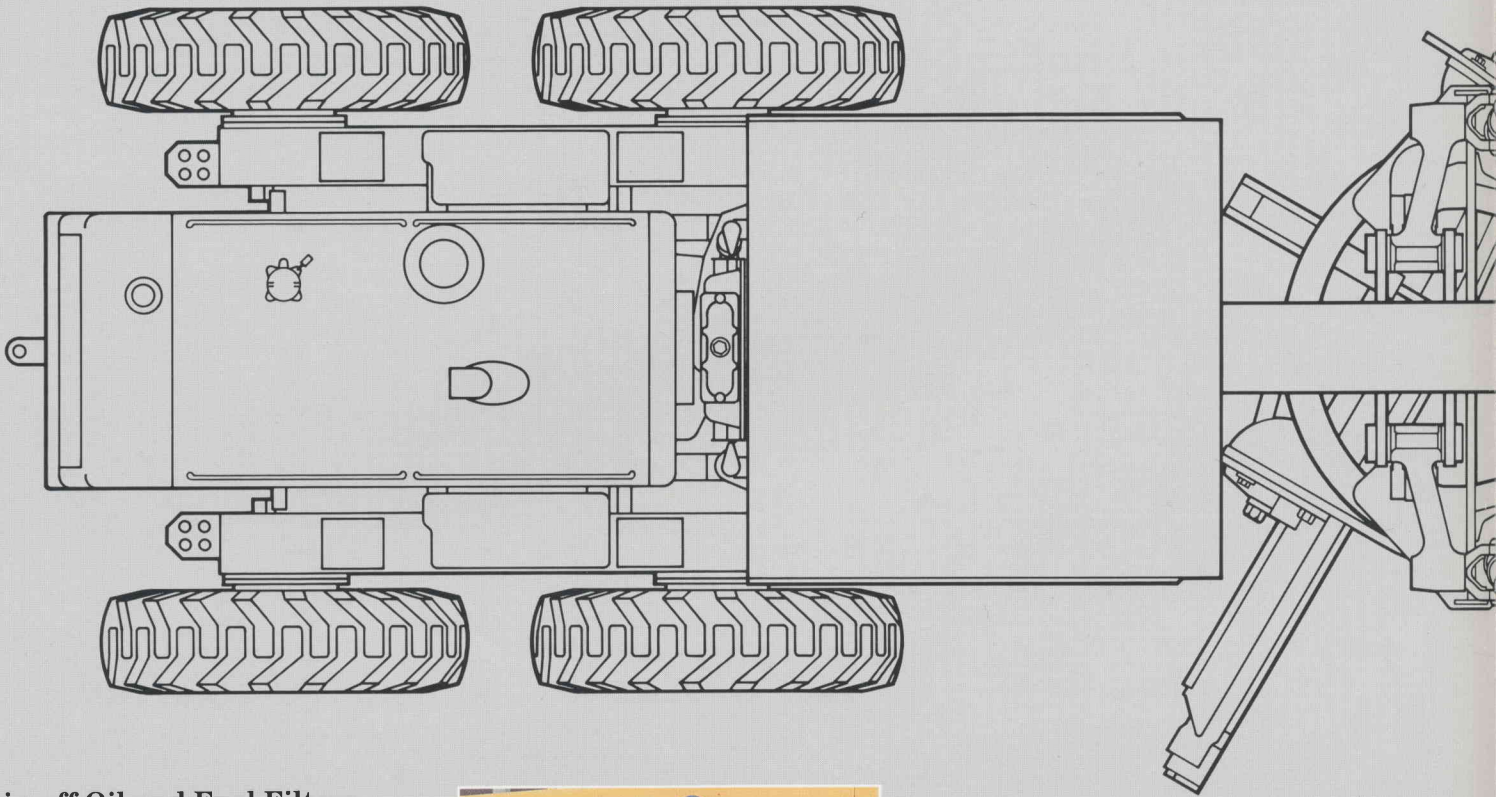
- Easier to check or service than valves located inside the hydraulic tank.

Electrical Connectors

- Sure-Seal Electrical Connectors provide long service life, resist moisture, corrosion and dirt.

Power Train Components

- Easily accessible for adjustments and major repairs.
- Transmission and final drives can be removed as units without disturbing the engine.
- Diagnostic Analysis Connector helps trouble-shoot electrical problems.



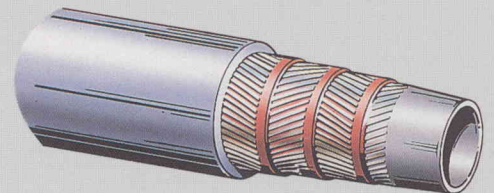
Spin-off Oil and Fuel Filters

- Disposable, easy to change without allowing contaminants into systems.
- Transmission and hydraulic systems use identical filters, to simplify parts stocking.



XT-3 Hydraulic Hose and Couplings

- Used throughout, extra strength for long, trouble-free performance.

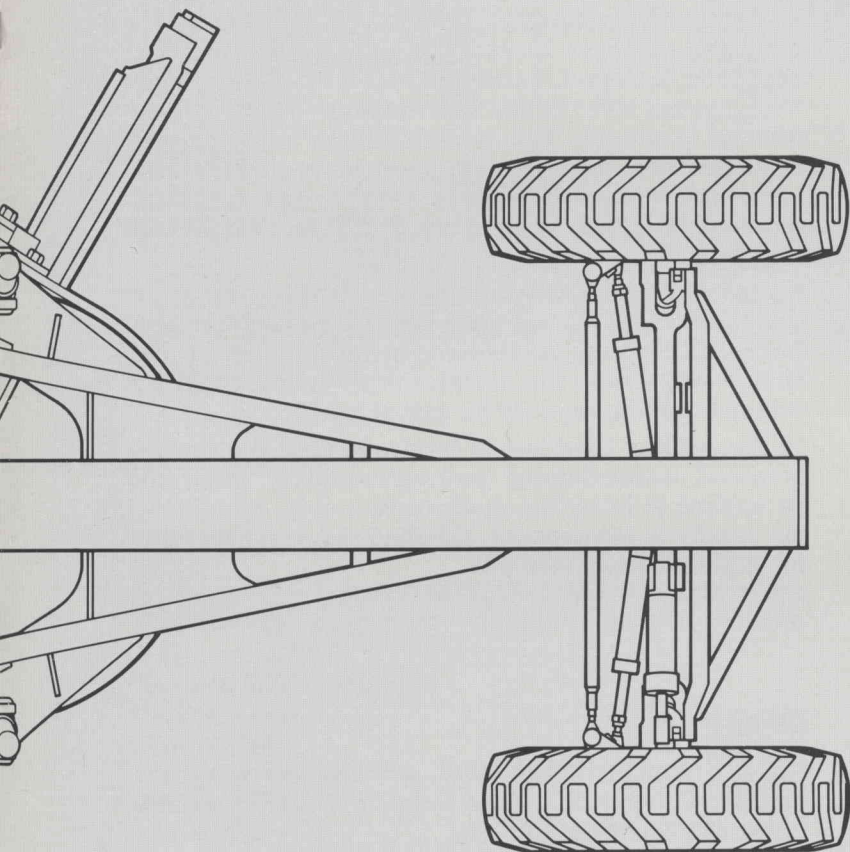


Engine

- Injection nozzles are field replaceable. Six hole tip converts fuel flow to fine spray for complete combustion.

- Individual scroll-type fuel pumps for each cylinder require no balancing ...maintaining fuel efficiency without periodic adjustment.

- Forged, induction-hardened crankshaft can be reground and reused.
- Caterpillar Remanufactured cylinder heads, unit injections, oil pumps, connecting rods, crankshafts, turbochargers, water pumps and starters are available for fast economical repairs.



Total Customer Support

Unmatched in the industry!

- **Parts availability** — Most Cat parts are immediately available off the shelf. Dealer parts availability is backed up by Cat's computer-controlled emergency search system.
- **Service capability** — Whether in the dealer's fully equipped shop or in the field, you'll get trained servicemen using the latest technology and tooling.

- **Machine management services** — Cat dealers help manage equipment investments with:
 - Effective preventive maintenance programs.
 - Diagnostic programs like Scheduled Oil Sampling and Technical Analysis.
 - Information to make the most cost-effective repair option decisions.
 - Customer meetings, training for operators and mechanics.

- **Exchange components for quick repairs** — Low-cost components assure maximum, cost-effective uptime.
- **Literature support** — Easy-to-use operation and maintenance guides help you get the full value out of your equipment investment.

SPECIFICATIONS



Caterpillar Engine

Gross power @
2200 RPM111 kW/**149 HP**

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 J1349 standard conditions, 25° C/77° F and 100 kPa/29.61" Hg, using 35 API gravity fuel oil at 15.6° 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 four-stroke-cycle 3306 diesel Engine with six cylinders, 121 mm/**4.75 in.** bore, 152 mm/**6 in.** stroke, and 10.5 liters/**638 in.³** piston displacement.

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

Cam-ground and tapered aluminum-alloy pistons with three-ring design; both compression rings ride 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 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.



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, machine won't move even if 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	3.8	5.9	9.7	15.5	24.5



Brakes

(System meets OSHA regulations.)

Service – Four-wheel, air-actuated, oil disc brakes are completely sealed and adjustment-free with 1.97 m²/**3055 in²** of braking surface per wheel. Low air pressure, below 448 kPa/4.5 bar/**65 psi** in either circuit of the brake system, is indicated to the operator by visual (red light and flashing LED) and audible (horn) warnings.

Parking – (System meets SAE J1152 and ISO 3450.) 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.

Secondary braking system – 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 fast stops.

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



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

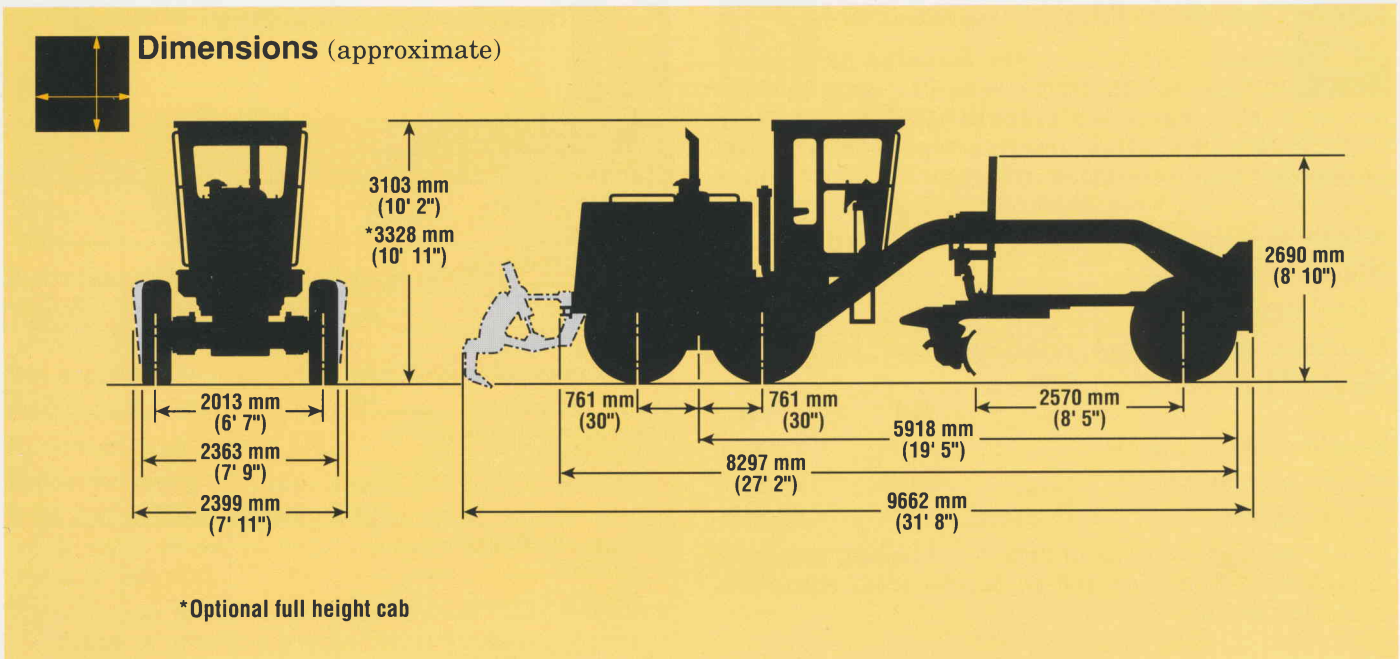
Height x width.....506 x 201 mm/**18.38" x 7.90"**

Sidewall thickness, outer.....18 mm/**.71"**

inner.....16 mm/**.63"**

Drive chain pitch.....51 mm/**2"**

Wheel axle spacing.....1524 mm/**60"**



Frame

Main frame – flanged, box-section structure runs from front bolster to the articulation joint.

Top and bottom plates –
width x thickness 305 x 22 mm/12" x .88"

Side plates –
height x thickness 248 x 12 mm/9.75" x 0.47"

Linear weight
(min-max) 151–199 kg/m/102–134 lb/ft

Vertical section
modulus (min-max) 1888–4036 cm³/115–246 in³

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

Wheels

Interchangeable rim and wheel assemblies. Tubeless tires, six 13.00 – 24, 10 PR (G2) traction-type.

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 DH2 steel with reversible overlay end bits and 16 mm/0.62" diameter bolts.

Width x thickness 152 x 16 mm/6" x .62"

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 J1040c and ISO 3471-1986. They also meet FOPS (Falling Object Protective Structure) criteria SAE J231 JAN81 and ISO 3449-1984. When properly installed and maintained, cab with doors and windows closed meets OSHA and MSHA requirements for operator sound exposure limits in effect at time of manufacture when tested according to ANSI/SAE J1166 FEB87. Equipped with 3" wide seat belt which meets SAE J53.

SPECIFICATIONS



Operating Weight (approximate)

Basic operating weight includes lubricants, coolant, full fuel tank, operator, 3658 mm/12' blade with hydraulic sideshift, and tip, and 13.00 – 24", 10 PR (G2) traction-type tires and low profile ROPS cab (standard in U.S.):

	Kg	Lb
Weight on front wheels	3764	8298
Weight on rear wheels	9561	21,077
Total weight.....	13 325	29,375

Equipped as above and including ripper, push plate, 14.00 – 24" tires and 10" rims:

	Kg	Lb
Weight on front wheels	4008	8835
Weight on rear wheels.....	11 165	24,615
Total weight.....	15 173	33,450

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



Service Refill Capacities

	Liters	U.S. Gallons
Fuel tank	289	75
Radiator.....	40	10.6
Crankcase.....	27	7.1
Transmission differential and final drive	79	21
Tandem housings (each)	64	17
Hydraulic system	76	20



Scarifier Specifications

Scarifier Placement Type	Front-Mounted		Rear-Mounted
	V-Type	Straight	Ripper
Working width.....mm in	1180 46.6"	1800 71"	2197 86.5"
Scarifying depth, maximum.....mm in	292 11.5"	317 12.5"	282 11.1"
Ripping depth, maximum.....mm in	— —	— —	430 17.1"
Scarifier shank holders, number.....	11	17	9
spacing.....mm in	117 4.6"	111 4.38"	270 10.5"
Ripper shank holders, number.....	—	—	5
spacing.....mm in	— —	— —	530 21"
Increase in machine length, beam raised ...mm in	— —	— —	1194 3'11"





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	1870 mm/6'1.5"
Left	1830 mm/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° rearward

*Add 305 mm/12" right or left for 4267 mm/14' blade.
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.



Blade Controls

Full hydraulic controls provide fast, constant control speed regardless of engine speed. Lock valves in each implement circuit minimizes 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.

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.



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.



Load Sensing Hydraulics

The closed center variable displacement pressure pump senses a load requirement from an implement or steering and increases the output pressure to 300 psi above the load. With no requirement, the pump maintains 430 psi output pressure. This reduces heat generation, increases hydraulic efficiency, and improves fuel economy. Hydraulic lock valves in all implement circuits minimize undesirable cylinder drift.

Output at 2200 engine RPM and 2965 kPa/29.6 bar/
430 psi to 24 133kPa/241.3 bar/3500 psi
.....0 to 208 liters/min/0 to 55 gpm



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. Replaceable **bronze-alloy wear strips** between circle and drawbar, and support shoes and circle eliminate circle shoe grease fittings and extend wear life.



Circle

Rolled ring forging, 1530 mm/60.3" 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 – thickness

32 mm/1.25"

The Competitive Edge

Performance

- Articulated frame — for excellent maneuverability.
- Direct drive power train — high torque rise Cat diesel engine combined with a direct drive power shift transmission gives the feel and efficiency of direct drive. Easy on-the-go shifting up or down, forward or reverse.

Reliability/Durability

- Frame — flanged box-section main frame resists shocks and vertical flexing.
- Drawbar — box section, A-frame design for high strength and precision blading.
- One-piece circle — with flame cut teeth. Induction hardened for long life. Exclusive bronze alloy wear strips between all circle and drawbar assembly wear surfaces, and moldboard sideshift rails.
- Caterpillar XT-3 hose — reliable, long life performance.

Maintenance/Repair

- Transmission and final drives can be removed as units without disturbing the engine.
- Sealed, adjustment-free, air-actuated, four-wheel oil disc brakes.
- Long lubrication intervals with ground accessible fittings.
- Easy access to daily service areas for maintenance ease.
- No daily grease fittings.
- Spin-on oil and fuel filters for easy replacement.

Operating Ease

- Adjustable operator's console and steering wheel with short throw, low-effort controls for ease of operation.
- Optional adjustable suspension seat — the most comfortable position for each operator.
- Good blade visibility.
- Electronic Monitoring System to check all critical functions.
- Low profile, resiliently-mounted, sound suppressed cab for reduced noise and vibration.

Total Customer Support System

- Parts availability — most Cat parts on dealer's shelf when you need them — computer-controlled, emergency search system backup.
- Service capability — dealer's shop or fast field service — trained servicemen — latest tooling and technology.
- Machine management services — effective preventive maintenance programs, diagnostic programs (Scheduled Oil Sampling, Technical Analysis), cost effective repair options, customer meetings, operator and mechanic training.
- Exchange components for quick repair — choose remanufactured products or rebuilt components for maximum availability and lower costs.
- Literature support — easy-to-use operation, maintenance guides help you get the maximum value out of your equipment investment.
- Flexible Financing — your dealer can arrange attractive financing on the entire line of Cat equipment. Terms structure to meet your cash flow requirements. See how affordable and easy it is to own Cat equipment.

Custom Machine Products

- In addition to the standard range of optional equipment, special attachments and machine configurations to suit particular customer applications can be made. Contact your Caterpillar dealer for details on matching the Caterpillar product to your special applications.

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