



120G

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® 3304 diesel Engine

Gross Power.....	102 kW/137 HP
Flywheel Power.....	93 kW/125 HP
Blade width	3658 mm/12 ft
*Operating weight	13 189 kg/29,050 lb

*Scarifier, 14' x 24" blade and 14:00 - 24" tires with 10" rims.
Machine shown may include optional equipment.

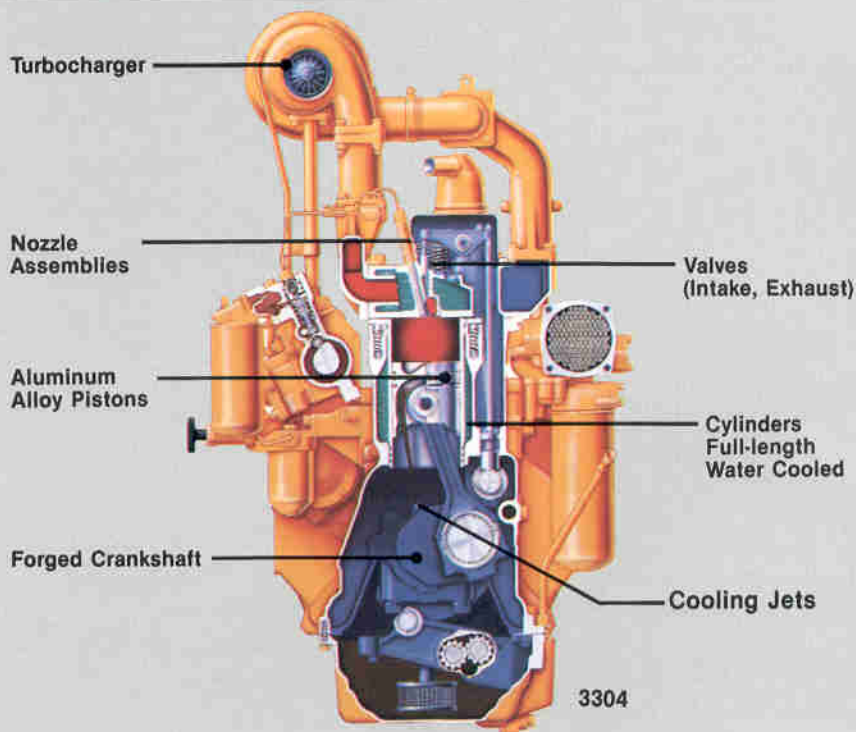


Caterpillar® Power Train

Designed for durability and efficiency.

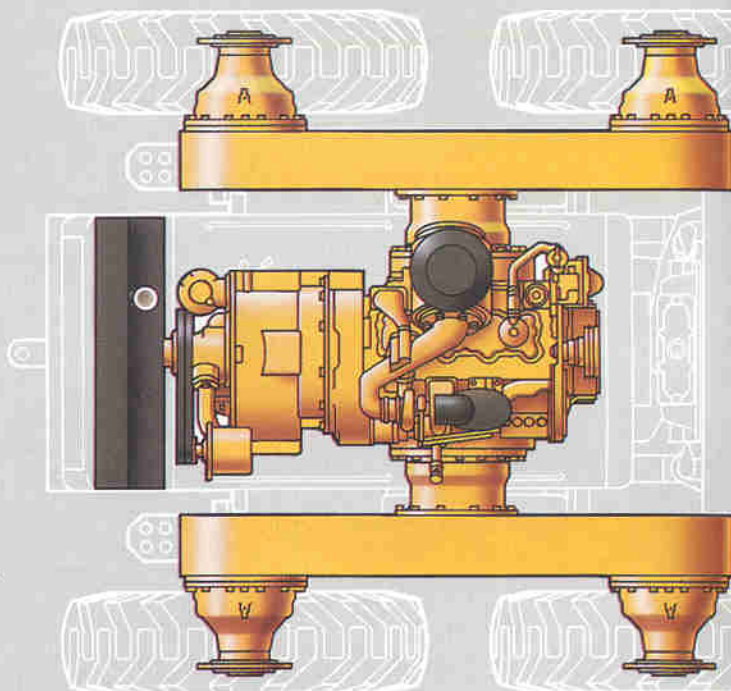
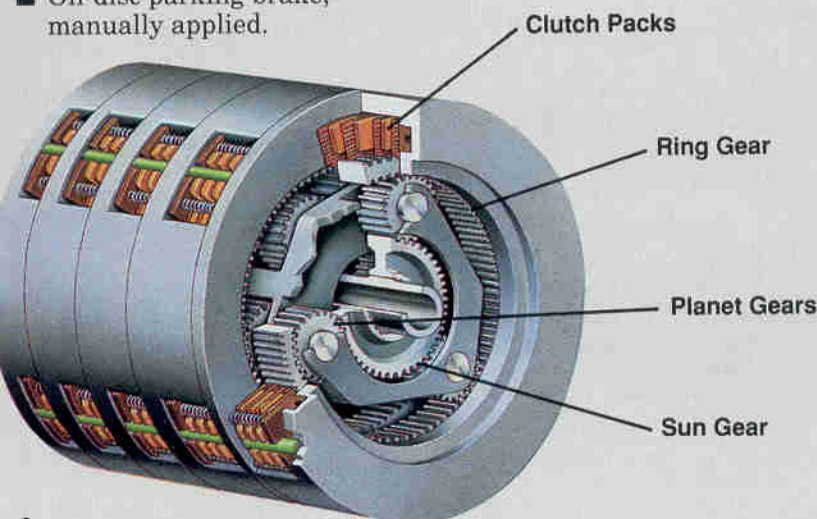
Cat Diesel Engine...Caterpillar four-stroke cycle engines blend power and efficiency.

- 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.



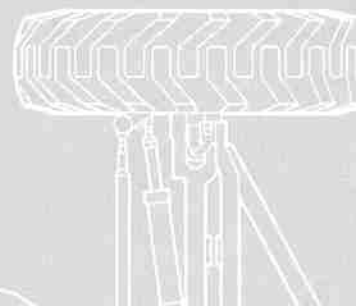
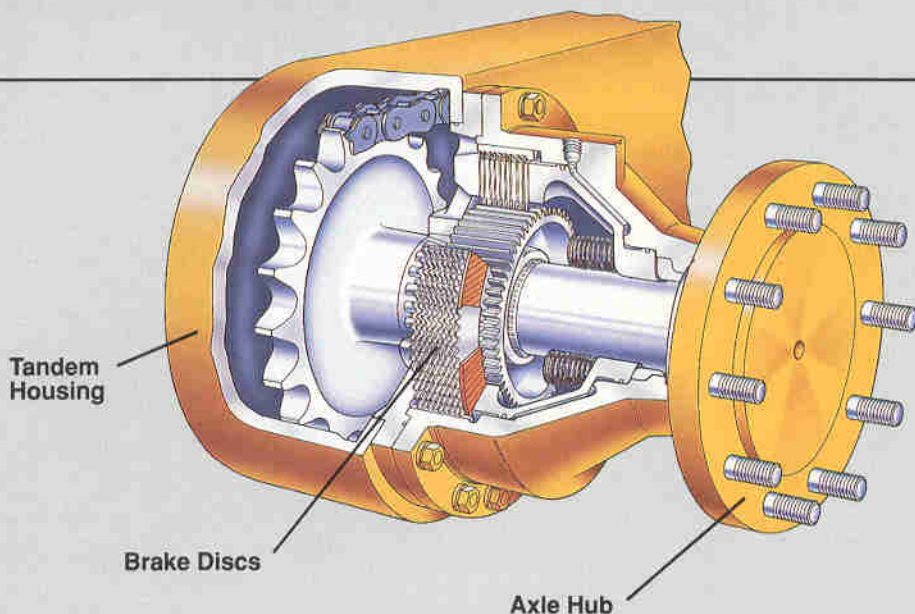
Direct-Drive, Power Shift Transmission...designed specifically for motor graders.

- 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.

Low effort for fingertip response and clustered so a single hand can actuate two or more controls when needed.

Short throws (38.1 mm/1.5" front to back range) and modulation gives precise hydraulic implement movement.

■ O-ring face seals used on all fittings for a "dry machine".

■ Separate oil system to protect against contamination from other systems.



Left Blade Lift

Moldboard Side Shift

Blade Tip

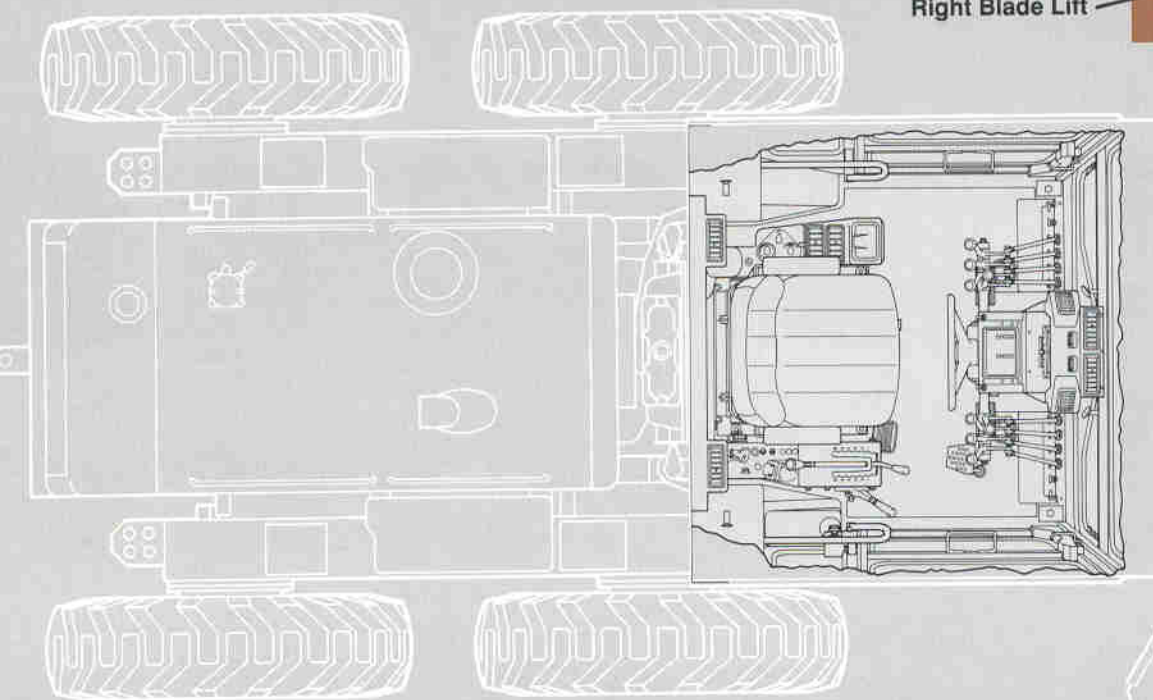
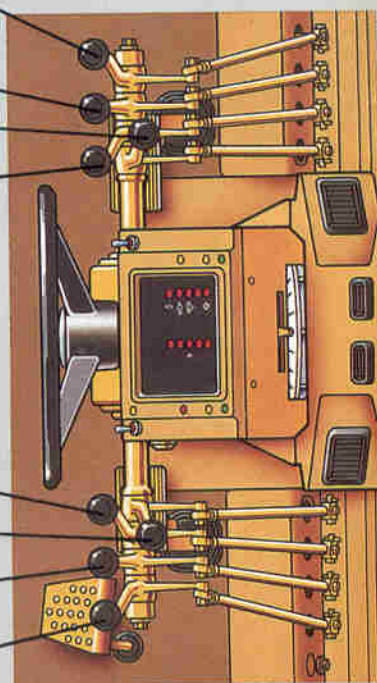
Circle Reverse

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)

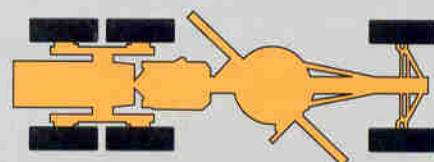
■ Shock protection for the circle, drawbar assembly, circle drive and moldboard.

■ 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.

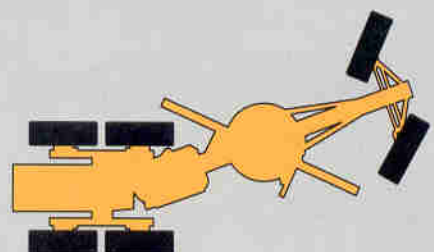
Maneuverability

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



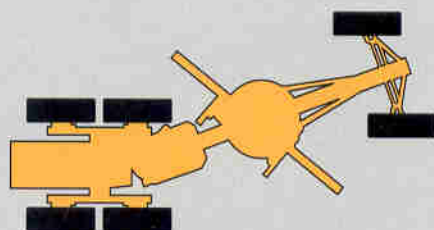
Straight Frame

- 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.

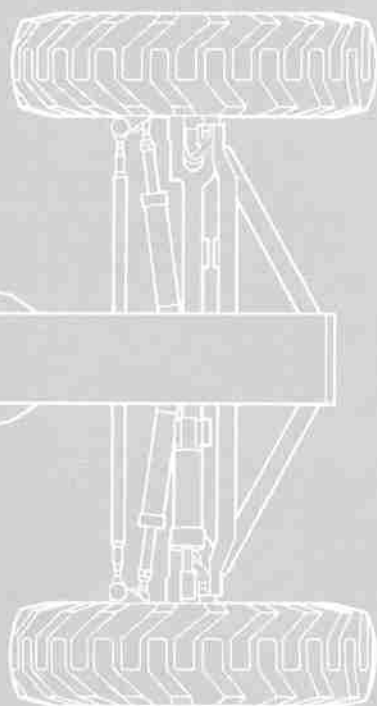
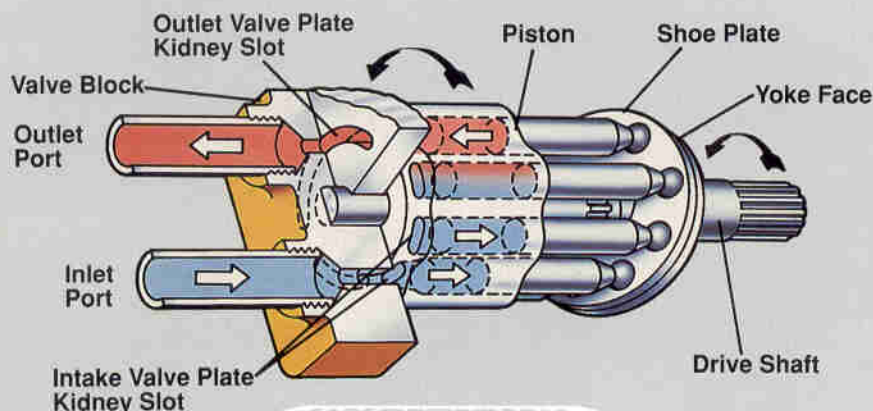


Crab Steering

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

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.



FEATURES

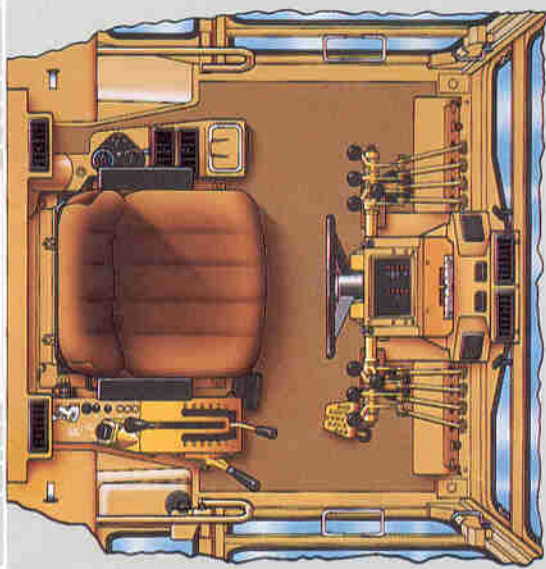
Operator's Station

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. (Vinyl static adjustable seat provided with canopies.)
- 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.

- 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.

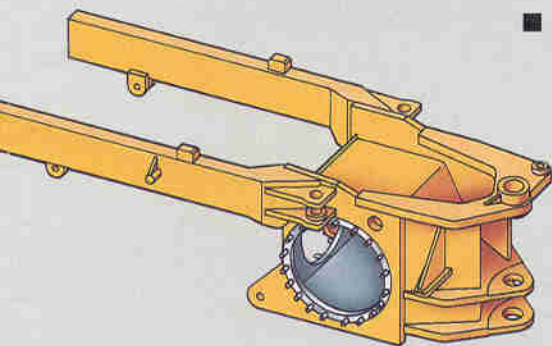
Level one — Alternator.
Level two — Engine coolant, Hydraulic oil temperature.
Level three — Engine oil pressure, Brake pressure.

Total Climate Systems (optional)

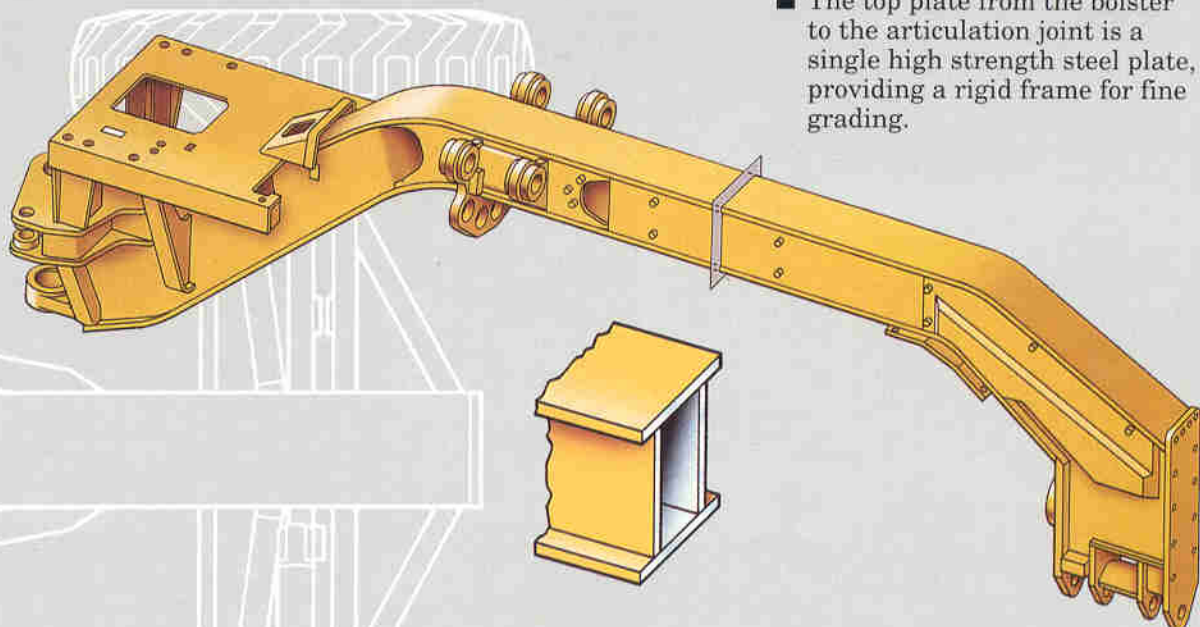
- **Air Conditions...**high capacity...cools and freshens hot, humid cab air.
- **Heats...**high capacity...protects against biting cold air in winter operation.
- **Dehumidifies...**removes excess moisture in the air down to 32°F (0°C). On hot, humid days, operator stays fresh and alert.

- **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.

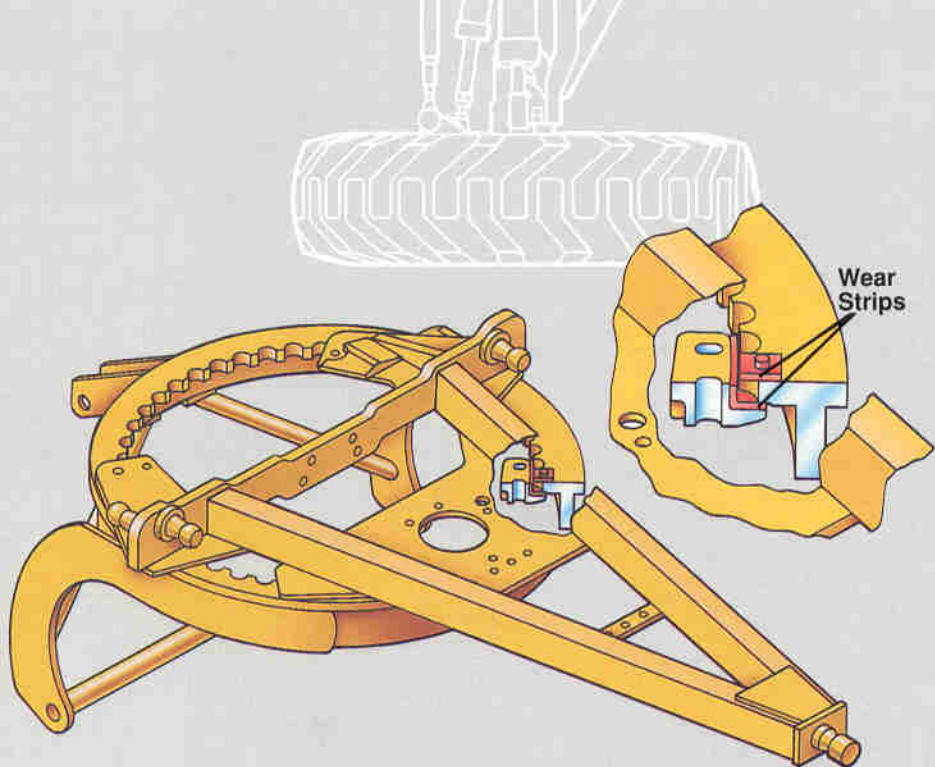
Structure



- 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 solid beam, A-frame, for high strength.
- **Circle**
 - Fabricated 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 extends wear life.

FEATURES

Serviceability

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

Outside-Mounted Hydraulic Valves

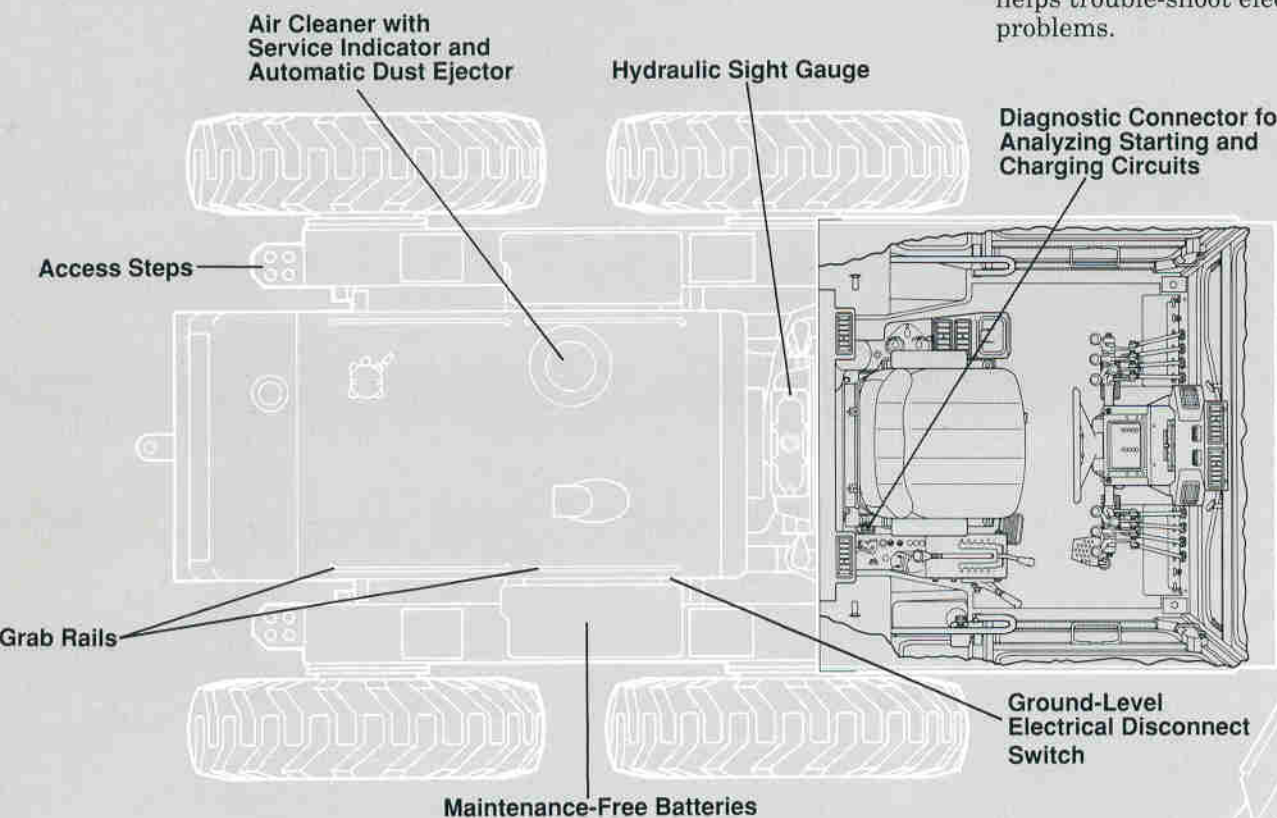
- Easier to check or service than valves located inside the hydraulic tank.

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, simplify parts stocking.

XT-3 Hydraulic Hose

Cover... Abrasion and weather resistant. Mine Safety and Health Administration (MSHA) Certified.

Cushion... Holds wire in place and eliminates wire rubbing.



High Strength Wire... Spiral wound for flexibility.

Flexible Inner Liner... Fabric reinforced for strength.

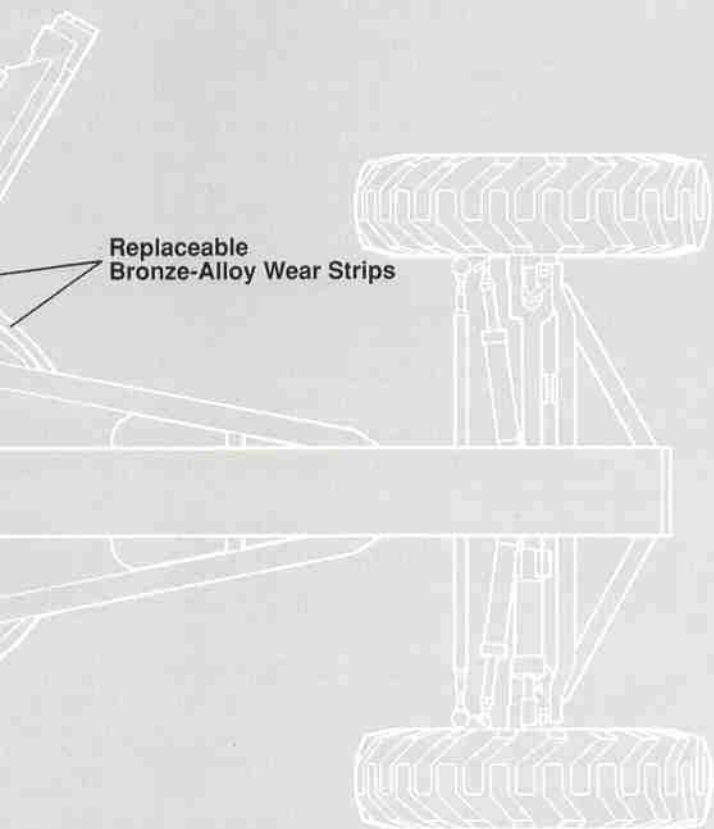


Engine

- 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.



Overlay
Age and End Bits



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** — 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 RPM.....102 kW/**137 HP**
Flywheel power @ 2200 RPM.....93 kW/**125 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 compressor, air cleaner, water pump, lubricating oil pump, fuel pump, muffler and alternator. No derating is required up to 2300 m/7,500 ft. altitude.

Caterpillar four-stroke-cycle 3304 turbocharged diesel Engine with four cylinders, 121 mm/**4.75 in.** bore, 152 mm/**6 in.** stroke, and 7 liters/**425 in.³** piston displacement.

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

Cam-ground and tapered, aluminum-alloy pistons have three rings each; both compression rings ride in iron band cast into piston. Piston undersides are cooled by oil spray. Stellite-faced valves, valve rotators and valve seat inserts. 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 secondary elements, automatic dust ejector and service indicator.

Direct-electric, 24-volt starting system with 50-amp alternator, heavy-duty starter, ether starting aid and maintenance-free batteries.



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	3.9	6.2	9.8	16.2	25.9	40.9
MPH	2.4	3.9	6.1	10.1	16.1	25.4



Brakes

(System meets OSHA regulations.)

Service – Four-wheel, air-actuated, oil disc brakes are completely sealed and adjustment-free with 1.67 m²/**2595 in²** total braking surface. 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 580 mm/**23"** ground clearance. Oscillates total of 32°.

Front wheel lean angle 18° left or right

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

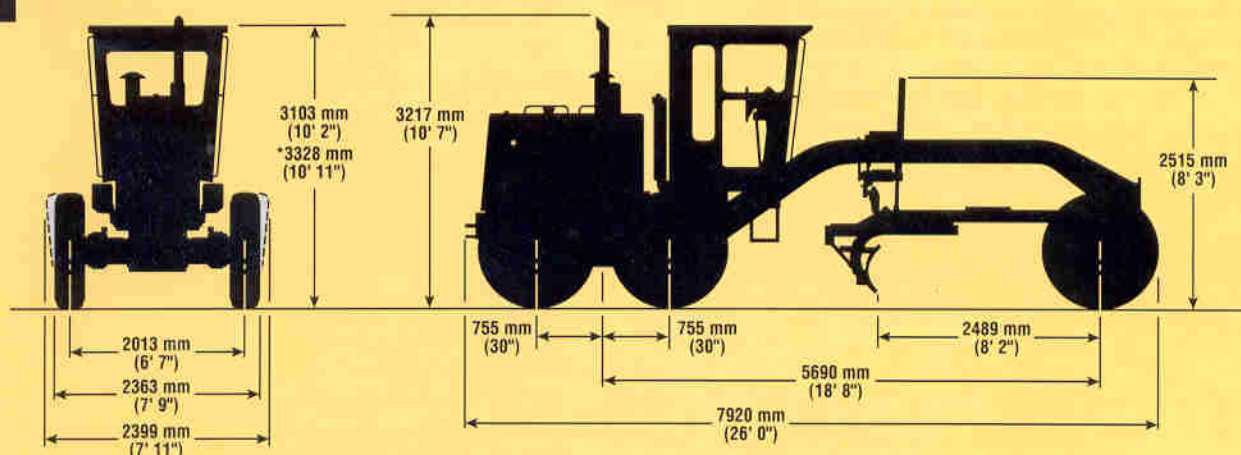


Tandems

Height x width.....438 x 172 mm/**17.25" x 6.75"**
Sidewall thickness.....16 mm/**.63"**
Drive chain pitch.....44 mm/**1.75"**
Wheel axle spacing.....1524 mm/**60.0"**



Dimensions (approximate)



*Optional full height cab



Frame

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

Top and bottom plates –

width x thickness 280 x 20 mm/11" x .79"

Side plates –

height x thickness 222 x 10 mm/8.75" x 0.39"

Linear weight

(min–max) 122-162 kg/m/82.3-190.4 lb/ft

Vertical section

modulus (min–max) 1393-3179 cm³/85-194 in³

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



Wheels

Interchangeable rim and wheel assemblies. Tubeless tires, six 13.00 – 24, 8 PR (G-2) traction-type.



ROPS

ROPS (Rollover Protective Structures) offered by Caterpillar for this machine meet ROPS criteria: SAE J396, SAE J1040 APR88 and ISO 3471-1986. They also meet FOPS (Falling Object Protective Structure) criteria SAE J231 JAN81 and ISO 3449-1984.



Moldboard

Wear-resistant, high-carbon steel, with box-section reinforcement.

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/.62" diameter bolts.

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



Cab

(Low-profile ROPS cab is standard in U.S.A.)

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 manual sideshift and 13.00 - 24", 8 PR traction-type tires and low profile ROPS cab (standard in U.S.):

	Kg	Lb
Weight on front wheels	3316	7310
Weight on rear wheels	8165	18,000
Total weight	11 481	25,310

Equipped as above and including optional V-type scarifier, 4267 mm/14' blade with hydraulic sideshift and tip, 14.00 - 24 (10 PR) traction-type tires and 10" rims:

	Kg	Lb
Weight on front wheels	4246	9352
Weight on rear wheels	8943	19,698
Total weight	13 189	29,050

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



Scarifier Specifications

Working width	1180 mm/46.6"
Scarifying depth, maximum	292 mm/11.5"
Scarifier shank holders, number	11
spacing	116 mm/4.6"



Service Refill Capacities

	Liters	U.S. Gallons
Fuel tank	227	60
Radiator	38	10
Crankcase	19	5
Transmission differential and final drive	68	18
Tandem housings (each)	49	13
Hydraulic system	68	18





Blade Range

Circle centershift, Right	500 mm/19.7"
Left	570 mm/22.4"
Moldboard sideshift, manual,	
Right	380 mm/15"
Left	none
Optional hydraulic,	
Right	670 mm/26.5"
Left	520 mm/20.5"
Maximum shoulder reach outside of tires;*	
Manual sideshift, Right	1524 mm/5'
Left	1219 mm/4'
Hydraulic, Right	1829 mm/6'
Left	1740 mm/5'8.5"
Maximum blade position, angle, both sides	90°
Maximum lift above ground	410 mm/16.14"
Maximum depth of cut	450 mm/17.72"
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.	



Hydraulic Controls

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



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)	6.7 m/22'

*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 2067 kPa/21 bar/**300 psi** above the load. With no requirement, the pump maintains 2965 kPa/29.6 bar/**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/20 bar/**430 psi** to 24 115 kPa/241 bar/**3500 psi**
.....0 to 157 liters/min/**0 to 41 gpm**



Drawbar

Solid-section, 140 x 89 mm/**5.5 x 3.5"** A-frame with four 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 extends wear life.



Circle

Fabricated T-section, 1530 mm/**60.3"** diameter. Uniform, flame-cut teeth. Hydraulically driven worm and gear provide full 360° circle rotation. Optional circle drive slip clutch.

Blade beam – thickness

32 mm/1.25"



Standard Equipment

NOTE: Standard and optional equipment may vary. Consult your Caterpillar Dealer for specifics.

Accelerator/decelerator.
Air cleaner, dry-type with
precleaner, automatic dust
ejector and service indicator.
Alternator, 50-amp.
Articulated frame.
Articulation indicator.
Backup alarm
(U.S. only, meets SAE J994).
Batteries, maintenance-free.
Blower fan.
Coolant temperature gauge.
Control console, adjustable.
Drawbar, four shoe,
with replaceable bronze-alloy
wear strips.

Electronic Monitoring System
(EMS).
Ether aid.
Four-wheel, oil disc brakes.
Horn (meets SAE J1105).
Hydraulic blade controls.
Hydraulic power steering.
Lights, stop and tail.
Lockable tool box and fuel cap,
with padlocks.
Moldboard,
3658 mm/12' manual sideshift
moldboard with manual tip
control, 152 x 16 mm/6 x 0.62"
DH2 steel cutting edges, with
16 mm/0.62" diameter bolts.

Muffler.
Parking brake.
Power shift transmission.
Protection caps – hydraulic tank,
radiator and fuel tank.
Rear drawbar.
ROPS cab (U.S.), low profile.
Seat, adjustable, static contour,
with 76 mm/ 3" wide seat belt.
Starter, heavy-duty.
Steering wheel, tilt.
Traction tires, 13.00 – 24",
8 PR (G2).



Optional Equipment

(with approximate installed weights)

	Kg	Lb		Kg	Lb
Air conditioner/heater; provides cooling, heating, and pressurization	84	186	Jack, hydraulic	10	21
Air dryer	15	34	Lighting systems, 24-volt:		
Blades: Hydraulic sideshift			Cab directional and		
with tip control			cab headlights	13	28
3658 mm/12'	522	1151	Cab headlights and directional	9	20
4267 mm/14'	628	1385	Work lights, center and rear	6	13
without tip			Bar directional lights and		
3658 mm/12'	403	888	bar headlights	9	20
4267 mm/14'	509	1122	Warning beacon (amber)	3	6
Blade extension, 610 mm/2':			Mirrors, outside, right and left,		
Right or left	91	200	for cab or canopy	8	18
Blade, float	40	88	Rims, 254 mm/10",		
Cab, full height ROPS,			for use with 14.00 - 24" tires	157	346
sound-suppressed	54	120	Scarifier, front V-type, with 11 teeth ...	799	1762
Canopy, ROPS, includes			Seat, shock absorbing	14	30
rear wall with window			Starting aids:		
Full height	-150	-330	Heater, engine coolant, 120-volt	1	3
Low profile	-200	-440	Steering system, supplemental	45	100
Clutch, slip for circle drive	23	50	Tires		
Cutting edges, 203 x 19 mm/8 x 0.75"			13.00 - 24", 10 PR	89	197
without reversible overlay end bits:			13.00 - 24", 12 PR	89	197
3658 mm/12' blade	41	90	14.00 - 24", 10 PR	86	190
4267 mm/14' blade	51	112	14.00 - 24", 12 PR	94	207
with overlay end bits:			15.50 - 25", 8 PR	77	170
3658 mm/12' blade	67	148	Tool Kit	8	18
4267 mm/14' blade	73	161	Transmission guard	120	264
Defroster fan, rear	2	4	Vandalism protection:		
Drive train differential,			locking caps for crankcase fill and		
w/lock-unlock	33	73	dipstick, transmission filler spout		
End bits, reversible overlay	11	24	and transmission dipstick and		
Engine compartment doors	87	191	engine gauge panel guard	9	19
Heater, cab, hot water,			Windshield wiper, rear	4	8
includes pressurizer	34	76			

Hydraulic arrangements with one or more additional hydraulic valves are available for hydraulic blade sideshift, tip, V-type scarifier; and for attachments from other suppliers, such as snow plows and snow wings and bulldozer

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 — solid beam, A-frame design for high strength and precision blading.
- Fabricated 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's 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.