CAT

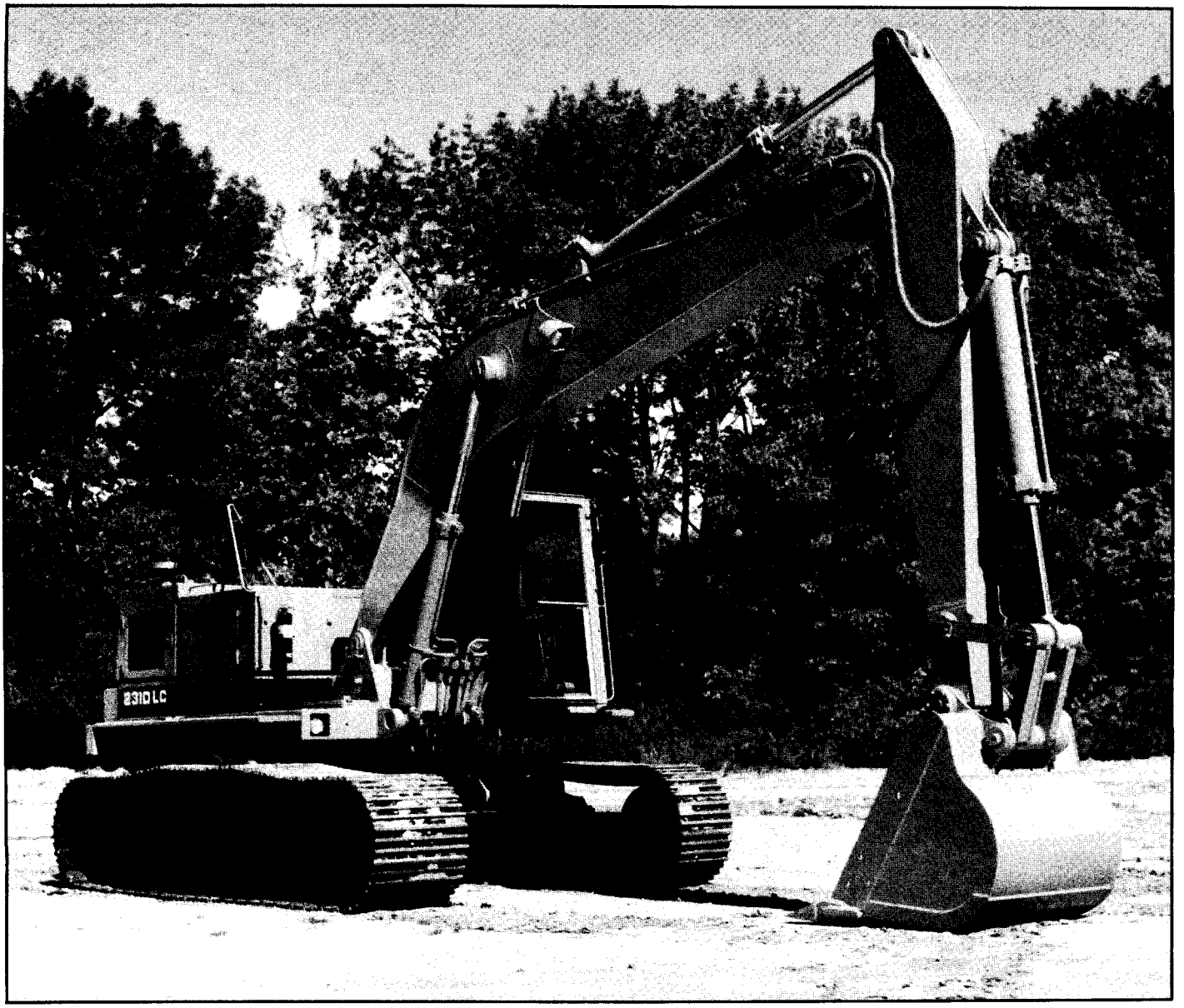
231D
231D LC

EXCAVATOR

- **Exceptional Productivity** -- Superior breakout force, high bucket fill factors, fast cycle times.
- **Reliable/Durable** -- Built to withstand severe working conditions.
- **Low Operating Costs** -- Highly efficient, long-life componentry.
- **Operator Comfort and Convenience** -- Quiet, efficient, protected, productive work environment.
- **Service and Maintenance Ease** -- Fast fluid level checks, reduced maintenance.
- **Total Customer Support** -- Unmatched in the industry!

Cat direct-injection, turbocharged
3208 Engine ..... 149 kW/200 HP
Operating Weight
231D ..... 35 230 kg/77,600 lb
231D LC ..... 35 470 kg/78,100 lb
Maximum Travel Speed
high speed .....5.5 kmh/3.4 MPH
low speed .....2.5 kmh/1.6 MPH
Bucket Capacities ...1119 to 1587 Liter/1.38 to 2.0 yd³

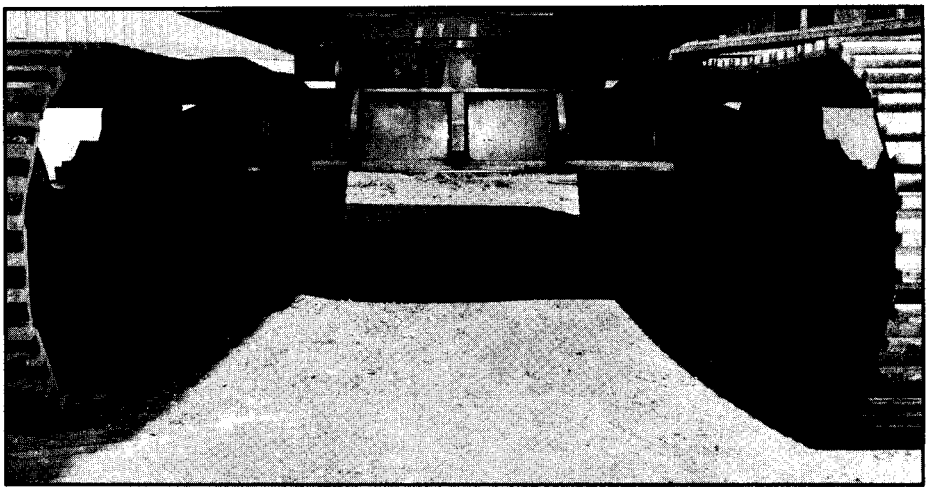
Machine shown may include optional equipment.



FEATURES

Rugged, Versatile Performer

Compare the features and you'll see why the Caterpillar 231D and 231D LC offer greater overall value!



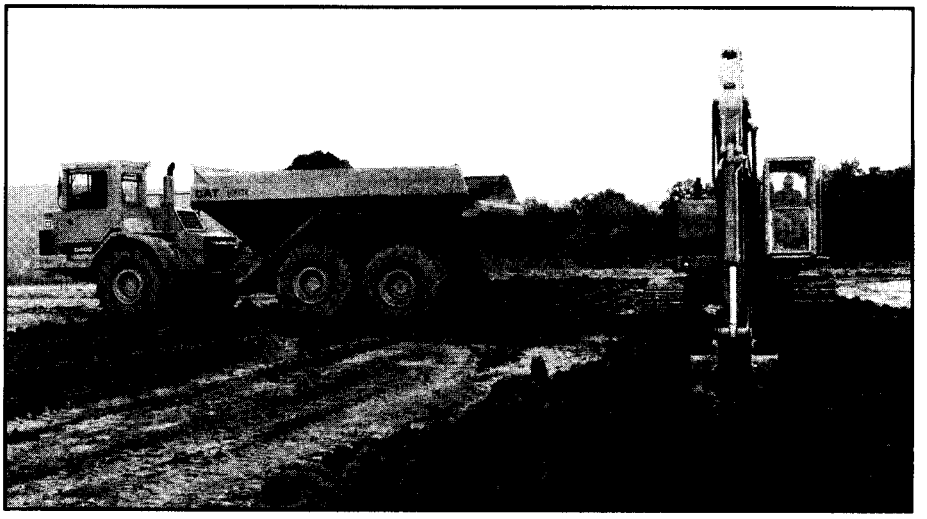
■ **Cat direct-injection, turbocharged 3208 Engine** ... proven around the world in earthmoving, industrial and over-the-road applications.
- **High displacement-to-power ratio** for reliable performance day-in, day-out.
- **Caterpillar direct-injection fuel system** for excellent fuel efficiency.

■ **Undercarriage designed and built by Caterpillar** ... the world's leading manufacturer of track-type machines.
- **Heavy, box-section track roller frames** bolted on for service and maintenance ease.
- **Standard length undercarriage** for good maneuverability in tight work areas.
- **Long undercarriage** for superior flotation and traction in poor underfoot conditions.
- **Three shoe sizes** available to match job requirements.

■ **Two-speed travel motors** ... for maximum productivity.
- High speed for fast travel around or between job sites.
- Low speed for maximum drawbar pull.

■ **High-performance hydraulics** make the 231D an exceptionally productive machine.
- **Cushion swing control** allows precision handling of heavy objects.
- **Standard heavy lift circuit** increases lifting capacity and reduces flow for precise load control.

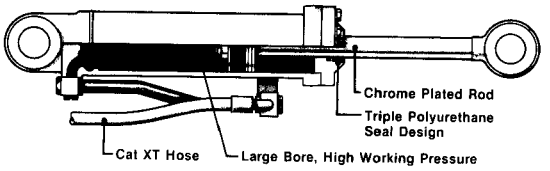
■ **Wide selection of attachments** ... for maximum versatility.
- **One-piece boom** -- features thick, one-piece, top and bottom plates for maximum durability.
- **Two sticks** -- choose the one that best matches the application.
- **Seven buckets** -- Caterpillar-designed and built buckets have large torque-tubes and transverse wear strips for excellent structural rigidity.
- **Six different bucket tips** and **four sidecutters** for a choice of ground engaging tools to match job conditions. Cat ground engaging tools ... designed, built and warranted by the same company that builds the bucket and the machine!



Variable-flow Hydraulics

Variable-flow system converts horsepower into high tool forces or faster speeds, according to job requirements, for maximum productivity

- Variable-flow piston pumps.
  - Fully utilize engine horsepower throughout work cycle.
  - Respond to hydraulic system needs.
- Power proportioning.
  - Allows lifting, digging, dumping and traveling in any combination.
  - Delivers power where it is most needed.
- Cushion swing control.
  - Provides smooth swing control for precise applications such as pipe setting, etc.
  - Easily activated by switch in cab.
- Heavy lift circuit is standard.
  - Substantially increases lifting capacity at the flip of an easy-to-reach switch, by increasing maximum implement pressure.
  - Reduces system flow for precise maneuvering in tight quarters or loading on lowboy.

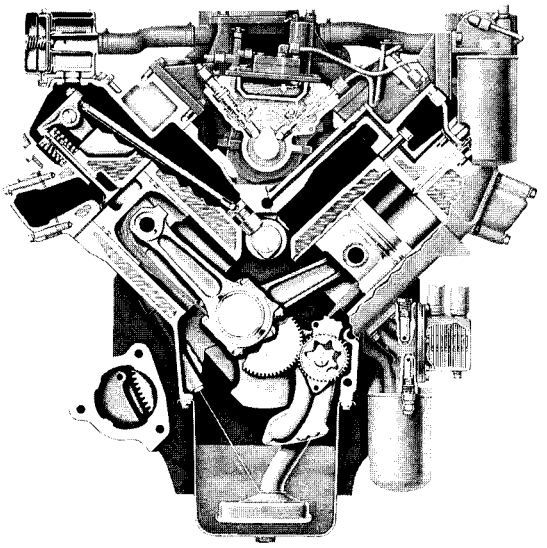


- Cat's XT-3 and XT-5 hose and reusable coupling system.
  - Exceptional strength.
  - Good hose flexibility.
  - Superior service life.
- Hydraulic cylinders.
  - Seamless-steel tubes, honed to fine tolerances.
  - Hardened, precision-ground, chrome-plated rods.
  - Triple-polyurethane seals guard against contamination, leaks.
  - Self-aligning spherical bearings on boom cylinders minimize twisting forces for excellent durability.
- Oil-to-air cooler -- offers efficient heat rejection for excellent hydraulic system protection.

Cat®3208 Engine

Reliable ... durable ... dependable!

- Turbocharged for increased performance and efficiency, especially at high altitudes. No derating required up to 3000 meters/10,000 feet.
- Direct-injection fuel system.
  - Adjustment-free pumps and valves.
  - Efficient, accurate fuel metering.
- Four-stroke-cycle design uses long power strokes for more complete fuel combustion and greater efficiency.
- Automatic Engine Speed Control standard.
  - Electronic governor control system automatically reduces engine speed when joysticks and travel controls are in neutral.
  - Three-position operation -- full power, off and economy ... decreases fuel consumption, noise.



  - Automatically returns engine to original operating RPM when joysticks or travel controls are actuated ... no resetting necessary.

Operator's Station

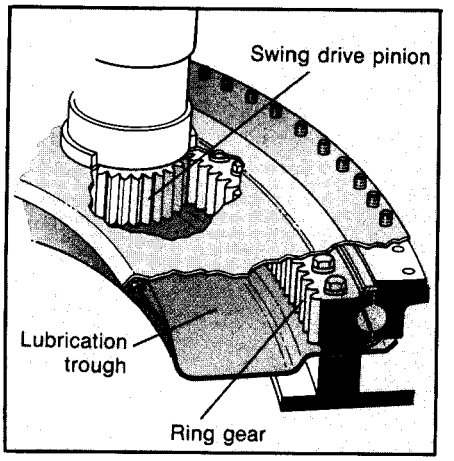
Excellent visibility, logical control placement, excellent operator comfort for fast, confident machine operation.

- Fabricated cab is about 50% heavier than competitive cabs for greater durability ... stays tight even after years of use.
  - Isolation-mounted unit uses large rubber mounts and a heavy, lead-lined rubber mat to suppress noise.
  - Spacious 926 mm/36" window-to-window inside width for excellent operator comfort.
- Excellent, all-around visibility and ventilation for confident machine operation.
  - Two-section windshield is adjustable five-ways.
  - Large side window and sliding rear window.
  - Well-guarded mirrors are standard.
- Four-way, adjustable suspension seat for superior comfort.
  - Joysticks and switches mounted on side consoles that move up and down with the seat, so they are always easy to reach.
- Hydraulic-over-hydraulic pilot control system.
  - Easy, well-modulated lever movement without surging.
  - Low lever efforts.
- Full instrumentation is standard, including engine oil level, engine oil pressure, coolant temperature and hydraulic oil temperature gauges.
- Separate travel pedals for each direction, forward and reverse, and steering lever.
  - Steering lever allows gradual and spot turns as well as counter-rotation.

Servicing Ease

Simplified maintenance and service means more time on the job, lower owning and operating costs.

- Self-lubricating swing gear rides in enclosed trough.
  - Contaminants are sealed out.
  - No hand greasing.
- Swing bearing greased every 50 service meter hours through fitting in cab.
- Remote, centralized lubrication fittings for hard-to-reach lube points on the one-piece boom.
  - Remaining lube points are conveniently located for easy access.
- Lip-type linkage pin seals keeps grit out, grease in.
- Hydraulic track adjusters standard.
  - Adjust track tension with a grease gun.
- Radiator, engine oil level, hydraulic fluid levels checked easily from convenient walkway.



- Maintenance and repair kits available to simplify service.
  - Preventive Maintenance kits with oil and air filters.
  - Hydraulic cylinder seal kits.
  - Engine tune-up kits with fuel nozzles.

- Exchange and Remanufactured components reduce parts costs, downtime.
  - Alternators to complete Cat Remanufactured 3208 Engines and hydraulic components available.
  - Warranted the same as new products.
  - Assembled, tested and ready to install.

SPECIFICATIONS

Caterpillar® Engine

Flywheel power at 2200 RPM
.....149 kW/200HP
(Kilowatts (kW) is the International System of Units equivalent of horsepower.)

Net power at the flywheel of the vehicle engine is based on SAE J1349 standard conditions of 25°C /77°F and 100 kPa / 29.61"Hg. Power is based on using 35° API (15.6°C / 60°F) gravity fuel having an LHV of 42 780 kJ / kg / 18,390 Btu/lb when used at 29.4°C /85°F and with a density of 838,9g / L / 7.001 lb/U.S. gal. Power rating is adjusted for vehicle equipped with fan, air cleaner, water pump, fuel pump, muffler and lubricating oil pump. No derating is required up to 3000 m. / 10,000 ft.

Caterpillar four-stroke-cycle, 3208 turbocharged diesel engine with eight cylinders, 114 mm/**4.5"** bore, 127 mm/**5"** stroke and 10.4 liters/**636 cu. in.** displacement.
Caterpillar direct-injection fuel system with individual, adjustment-free, injection pumps and valves.
Cam-ground and tapered, aluminum-alloy pistons have two rings each and are cooled by oil spray.
Forged, alloy-steel crankshaft is induction hardened and statically and dynamically balanced and is supported by steel-backed, copper-bonded bearings.
Easy-to-change, spin-on oil and fuel filters and dry-type air cleaner. Water pump, fuel pump and service meter standard.
Direct-current, 24-volt starting and charging system with two, 92-amp-hour, 12-volt batteries and 50-amp alternator.

Hydraulic system

Two variable-displacement piston pumps power the boom, stick, bucket, swing and travel circuits.
Output of each pump @ rated engine speed and 6895 kPa/**1,000 psi**..... 2 x 229 liters/min./**2 x 60.5 GPM**

A fixed-displacement gear pump powers the pilot-control circuit.
Output to pilot system @ rated engine speed and 1900 kPa/**275 psi**..... 85 liters/min./**22.6 GPM**
Oil-to-air hydraulic cooler is mounted in front of engine radiator.
Relief valve settings:
- Implement circuits ..... 29 660 kPa/**4,300 psi**
- Heavy lift circuit..... 33 100 kPa/**4,800 psi**
- Travel circuits ..... 33 100 kPa/**4,800 psi**
- Pilot circuit ..... 2310 kPa/**335 psi**

Cylinders, bore x stroke:
- Boom (2) ..... 152 x 1321 mm/**6.0" x 52.0"**
- Stick (1) ..... 165 x 1638 mm/**6.5" x 64.5"**
- Bucket (1) ..... 152 x 1156 mm/**6.0" x 45.5"**

Drive

Fully hydraulic; each track is driven by an independent, two-speed hydraulic motor. Speed is controlled by an electrical switch on the console. Two travel pedals: right pedal gives forward movement... the left, reverse. Triple-reduction, spur-gear final drive, fully enclosed and splash lubricated. Duo-Cone Floating Ring Seals on output shafts.

Maximum drawbar pull
- Low speed ..... 159 kN/**35,800 lb**
- High speed ..... 346 kN/**77,800 lb**

Maximum travel speed @ 2200 engine RPM: forward and reverse
- Low speed ..... 2.5 kmh/**1.6 MPH**
- High speed ..... 5.5 kmh/**3.4 MPH**

Track

Cat design and built track-type undercarriage. Reinforced box-section, track roller frame.
Sealed Track. Lifetime Lubricated rollers and idlers, hydraulic track adjusters and triple grouser shoes are standard.

	231D	**231D LC**
Number of shoes (each side)	47	54
Width of shoes (standard)	813 mm/**32"**	813 mm/**32"**
Number of track rollers (each side)	8	10
Overall track length	4520 mm/**14'10"**	5230 mm/**17'2"**
Track gauge	2640 mm/**8'8"**	2640 mm/**8'8"**
Ground contact area for indicated shoe sizes		
813 mm/**32"**	6.27 m^2/**9,727 in^2**	7.43 m^2/**11,520 in^2**
711 mm/**28"**	5.49 m^2/**8,510 in^2**	--
914 mm/**36"**	7.06 m^2/**10,940 in^2**	8.36 m^2/**12,960 in^2**

Controls

Two joystick hand levers actuate boom, stick, bucket and swing.
Right lever: Move forward and backward to lower and raise boom. Right and left to control bucket curl and dump.
Left lever: Move forward and backward to move stick out and in. Left and right to control swing direction.

Oblique movement of either lever operates any two functions simultaneously. Manually applied lever on the left console completely neutralizes the control system.

Swing Mechanism

Case-hardened drive gears are splash lubricated. Swing gear and pinion run in a trough of lubricant. No daily maintenance required. Hydraulic motor provides high swing torque for fast acceleration. No mechanical braking required. Releasing control cuts off oil flow to swing motor and stops rotation. A manual shoe-type brake locks the upperstructure during lifting applications on side slopes.

Smooth, modulated deceleration occurs when swing control lever is released, assuring accurate positioning for next work cycle.
Swing speed ..... 7.2 RPM

Cushion swing control standard:
A operator-controlled switch on the instrument panel activates the circuit to provide smoother, softer swing control for precision applications like pipe setting, etc.

Steering

A lever mounted between the travel pedals provides gradual pivot and counter-rotation steering. (1) Depress the forward or reverse pedal and move the lever right or left. This drives one track while slowing the other to turn the machine in the direction the lever was moved. (2) Move the lever farther, into contact with a "resistance" bumper spring, for a pivot turn with one track locked and the other driving. (3) Push the lever beyond the bumper spring to reverse the locked track for counter-rotation and a spot turn.

Service Refill Capacities

	Liters	U.S. Gallons
Fuel Tank	400	106
Cooling System	38	10
Lubrication:		
Engine Oil	13.3	3.5
Swing Drive	28	7.4
Final Drives (each)	53	14
Hydraulic System	575	152
Hydraulic Tank	303	80

Brakes

Two oil-disc brakes on final drive input shafts. Spring-applied, hydraulically released. When machine is stationary, brakes are set automatically. Depressing either travel pedal simultaneously disengages brakes.

SPECIFICATIONS

Standard Equipment

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

Air cleaner, dry-type.
Alarm, travel.
Alternator, 50-amp.
Automatic Engine Speed Control.
Cab, all-weather, sound-suppressed, including:
- Cigar lighter.
- Fans:
  - defroster.
  - circulating.
- Floor mat.
- Heater, cab.
- Horns, electric, front and rear.
- Hour meter, electric.
- Instrumentation:
  - Engine oil pressure gauge.
  - Coolant temperature gauge.
  - Hydraulic oil temperature gauge.
  - Voltmeter.
  - Hydraulic oil filter service light.
  - Flashing warning light.
  - High-speed travel indicator.

Lights, dome and dash.
Seat, four-way adjustable, suspended with armrests and side consoles.
Seat belt.
Windows, side, tinted LEXAN glass.
Windows, sliding rear, tinted with friction lock.
Windshield, two-section retractable with tinted, laminated glass top and clear, tempered glass in bottom.
Windshield wipers, dual with washer.
Counterweight:
- 231D 5688 kg/**12,540 lb.**
- 231D LC 4781 kg/**10,540 lb.**

Enclosures, louvered door and engine.
Guards:
- Idler recoil.
- Track guiding, front and rear.
- Track motor.
- Swivel.

Lifetime Lubricated rollers and idlers.
Linkage pins, sealed.
Locks, vandalism protection.
Lights, working, basic machine.
Lubrication points, centralized.
Mirrors, rear view.
Muffler.
Pump, pilot with through shaft for auxiliary unit.
Tow eyes, front and rear.
Track adjusters, hydraulic.
Track, Sealed with 813 mm/**32"** triple grouser shoes.
Walkway and handrails.

Optional Equipment

Air conditioner with heater and defroster.
Boom, one-piece, includes one stick and two boom cylinders.
Buckets.
Bucket linkage, includes cylinder.
Bucket sidecutters.
Bucket tips.
Check valves, boom and stick.
Cooling system, high ambient temperature.
Guards:
- Bottom.
- Pilot lines.
- Track guiding, full-length, 388 kg/**855 lb.**
- Windshield vandalism.

Hydraulics, auxiliary.
Hydraulic hammer arrangement.
Pump, hydraulic, high capacity.
Precleaner with prescreener.
Seat, adjustable and tilting suspension.
Starting aids:
- Ether.
- Low temperature system.

Sticks:
- 2900 mm/**9'6"**
- 3500 mm/**11'6"**

Track.
Undercarriage:
- Standard, 4520 mm/**14'10"**.
- Long, 5230 mm/**17'2"**.

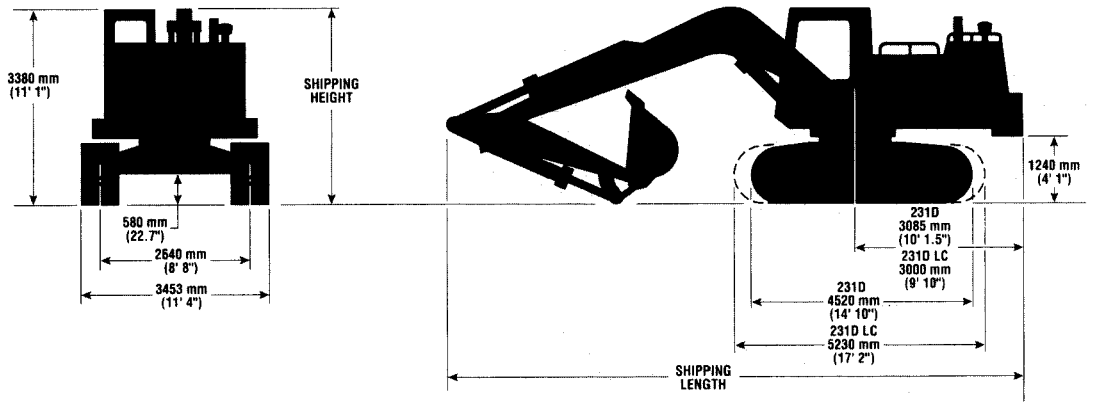
Working lights, boom.

Operating Weights*

Track Shoe / Stick	Single Grouser 711 mm/28"	Triple Grouser 813 mm/32"	Triple Grouser 914 mm/36"
231D Excavator			
2900 mm/**9'6"**	34 610 kg/ **76,200 lb**	35 230 kg/ **77,600 lb**	35 520 kg/ **78,200 lb**
3500 mm/**11'6"**	34 720 kg/ **76,500 lb**	35 330 kg/ **77,800 lb**	35 630 kg/ **78,500 lb**
231D LC Excavator			
2900 mm/**9'6"**	--- ---	35 470 kg/ **78,100 lb**	35 810 kg/ **78,900 lb**
3500 mm/**11'6"**	--- ---	35 570 kg/ **78,400 lb**	35 910 kg/ **79,100 lb**
Ground pressure with 2900 mm/**9'6"** stick			
231D Excavator	61.7 kPa/**9.0 psi**	55.0 kPa/**8.0 psi**	49.3 kPa/**7.2 psi**
231D LC Excavator	---	46.7 kPa/**6.8 psi**	41.9 kPa/**6.1 psi**

*Machine is equipped with 1375 mm/**54"** bucket.
Shipping weights: Subtract 75 kg/**165 lb** for operator, 305 kg/**670 lb** for 10% fuel.

Dimensions

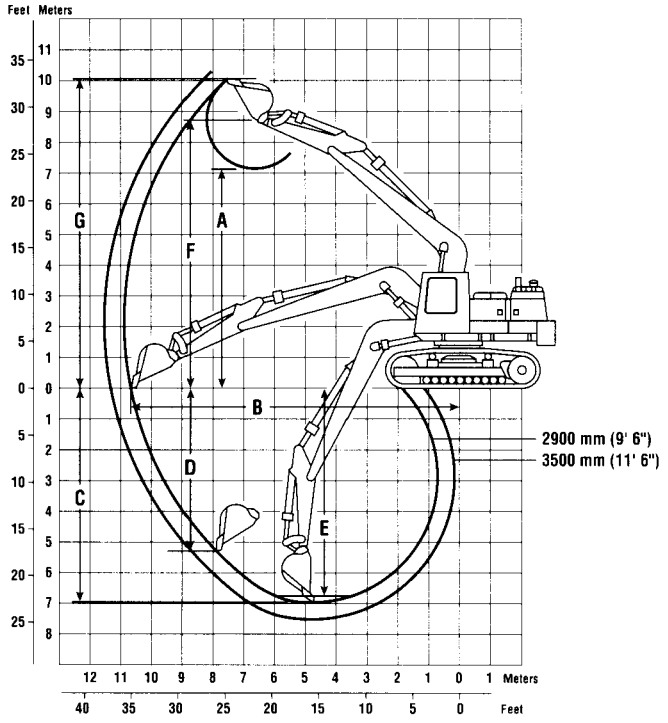


Stick	2900 mm/9'6"	3500 mm/11'6"
Shipping height	3470 mm/11'5"	3480 mm/11'5"
Shipping length*	10 830 mm/35'6"	10 830 mm/35'6"

*Subtract 85 mm/**3.5"** for 231D LC.

SPECIFICATIONS

231D Digging Envelope, One-Piece Boom



		Stick Length	
		2900 mm/ 9'6"	3500 mm/ 11'6"
A Maximum loading height bucket with teeth	mm	7160	7400
	ft. in.	23'6"	24'3"
B Maximum reach at ground level	mm	10 640	11 200
	ft. in.	34'11"	36'9"
C Maximum digging depth	mm	6940	7540
	ft. in.	22'9"	24'9"
D Maximum vertical wall digging depth	mm	5290	6130
	ft. in.	17'4"	20'1"
E Maximum depth of cut for 2440 mm/8' level bottom	mm	6750	7370
	ft. in.	22'2"	24'2"
F Maximum bucket hinge pin height	mm	8730	8970
	ft. in.	28'8"	29'5"
G Maximum height to bucket teeth at highest arc	mm	10 080	10 350
	ft. in.	33'1"	33'11"

SPECIFICATIONS

Lift Capacities

231D Excavator

STICK -- 2900 mm/9'6"
BUCKET -- 1375 mm/54"
BOOM -- ONE-PIECE

UNDERCARRIAGE -- 4520 mm/14'10"
TRACK SHOE -- 813 mm/32"
HEAVY LIFT CIRCUIT -- ACTIVATED

LOAD POINT HEIGHT		LOAD RADIUS 3.0 m/10.0 ft OVER FRONT	3.0 m/10.0 ft OVER SIDE	4.5 m/15.0 ft OVER FRONT	4.5 m/15.0 ft OVER SIDE	6.0 m/20.0 ft OVER FRONT	6.0 m/20.0 ft OVER SIDE	7.5 m/25.0 ft OVER FRONT	7.5 m/25.0 ft OVER SIDE	9.0 m/30.0 ft OVER FRONT	9.0 m/30.0 ft OVER SIDE	LOAD AT MAXIMUM REACH OVER FRONT	OVER SIDE	m ft
9.0 m **30.0 ft**	kg **lb**											*3950 ***8800**	*3950 ***8800**	7.9 **25.4**
7.5 m **25.0 ft**	kg **lb**							*5260 ***11,700**	*5260 ***11,700**			*3710 ***8200**	*3710 ***8200**	9.2 **29.8**
6.0 m **20.0 ft**	kg **lb**							*5440 ***11,900**	*5440 ***11,900**			*3660 ***8100**	3620 **8100**	10.0 **32.5**
4.5 m **15.0 ft**	kg **lb**			*8940 ***19,100**	*8940 ***19,100**	*6990 ***15,100**	*6990 ***15,100**	*6070 ***13,200**	5770 **12,400**	*5680 ***12,500**	4100 **8700**	*3740 ***8200**	3220 **7100**	10.4 **34.1**
3.0 m **10.0 ft**	kg **lb**			*12 290 ***26,200**	12 220 ***26,200**	*8560 ***18,400**	7880 **17,000**	*6910 ***15,000**	5510 **11,800**	5760 **12,300**	4000 **8500**	*3930 ***8600**	3040 **6700**	10.6 **34.6**
1.5 m **5.0 ft**	kg **lb**			*13 540 ***31,700**	11 280 **24,300**	*9990 ***21,500**	7400 **15,900**	7550 **16,200**	5250 **11,300**	5630 **12,100**	3870 **8300**	*4250 ***9400**	3020 **6600**	10.5 **34.3**
Ground Line	kg **lb**			*14 480 ***33,800**	10 940 **23,500**	10 360 **22,300**	7100 **15,300**	7350 **15,800**	5060 **10,900**	5530 **11,900**	3780 **8100**	4680 **10,300**	3180 **7000**	10.1 **33.0**
-1.5 m **-5.0 ft**	kg **lb**	*9740 ***22,000**	*9740 ***22,000**	*15 690 ***33,900**	10 900 **23,400**	10 230 **22,000**	6980 **15,000**	7260 **15,600**	4980 **10,700**			5250 **11,600**	3590 **7900**	9.4 **30.7**
-3.0 m **-10.0 ft**	kg **lb**	*16 010 ***36,200**	*16 010 ***36,200**	*14 900 ***32,200**	11 050 **23,700**	10 280 **22,100**	7020 **15,100**	7310 **15,700**	5020 **10,800**			*4940 ***10,700**	4470 **9900**	8.3 **27.0**
-4.5 m **-15.0 ft**	kg **lb**	*18 610 ***40,000**	*18 610 ***40,000**	*13 050 ***28,000**	11 380 **24,500**	*9530 ***20,300**	7250 **15,600**							

STICK -- 3500 mm/11'6"
BUCKET -- 1375 mm/54"
BOOM -- ONE-PIECE

UNDERCARRIAGE -- 4520 mm/14'10"
TRACK SHOE -- 813 mm/32"
HEAVY LIFT CIRCUIT -- ACTIVATED

LOAD POINT HEIGHT		LOAD RADIUS 1.5 m/5.0 ft OVER FRONT	1.5 m/5.0 ft OVER SIDE	3.0 m/10.0 ft OVER FRONT	3.0 m/10.0 ft OVER SIDE	4.5 m/15.0 ft OVER FRONT	4.5 m/15.0 ft OVER SIDE	6.0 m/20.0 ft OVER FRONT	6.0 m/20.0 ft OVER SIDE	7.5 m/25.0 ft OVER FRONT	7.5 m/25.0 ft OVER SIDE	9.0 m/30.0 ft OVER FRONT	9.0 m/30.0 ft OVER SIDE	LOAD AT MAXIMUM REACH OVER FRONT	OVER SIDE	m ft
9.0 m **30.0 ft**	kg **lb**													*3170 ***7000**	*3170 ***7000**	8.7 **28.0**
7.5 m **25.0 ft**	kg **lb**									*4480 ***9900**	*4480 ***9900**			*2990 ***6600**	*2990 ***6600**	9.8 **32.0**
6.0 m **20.0 ft**	kg **lb**									*4790 ***10,500**	*4790 ***10,500**	*4860 ***10,000**	4220 **9000**	*2950 ***6500**	*2950 ***6500**	10.5 **34.5**
4.5 m **15.0 ft**	kg **lb**							*6170 ***13,300**	*6170 ***13,300**	*5480 ***11,900**	*5480 ***11,900**	*5150 ***11,300**	4150 **8900**	*3010 ***6600**	2900 **6400**	11.0 **35.9**
3.0 m **10.0 ft**	kg **lb**					*10 890 ***23,300**	*10 890 ***23,300**	*7810 ***16,800**	*7810 ***16,800**	*6380 ***13,800**	5560 **11,900**	*5630 ***12,300**	4020 **8600**	*3160 ***7000**	2740 **6000**	11.1 **36.4**
1.5 m **5.0 ft**	kg **lb**					*13 760 ***29,600**	11 560 **24,900**	*9380 ***20,200**	7500 **16,100**	*7300 ***15,800**	5280 **11,300**	5630 **12,100**	3860 **8300**	*3430 ***7500**	2710 **6000**	11.0 **36.1**
Ground Line	kg **lb**			*5040 ***11,500**	*5040 ***11,500**	*15 300 ***33,000**	11 020 **23,700**	10 390 **22,300**	7120 **15,300**	7350 **15,800**	5050 **10,800**	5500 **11,800**	3740 **8000**	*3840 ***8500**	2830 **6200**	10.6 **34.9**
-1.5 m **-5.0 ft**	kg **lb**	*6350 ***14,200**	*6350 ***14,200**	*9030 ***20,400**	*9030 ***20,400**	*15 730 ***34,000**	10 850 **23,300**	10 190 **21,900**	6940 **14,900**	7210 **15,500**	4920 **10,600**	5430	3680	*4510 ***10,000**	3150 **7000**	10.0 **32.8**
-3.0 m **-10.0 ft**	kg **lb**	*10 260 ***23,000**	*10 260 ***23,000**	*13 810 ***31,200**	*13 810 ***31,200**	*15 320 ***33,100**	10 910 **23,400**	10 170 **21,800**	6920 **14,900**	7190 **15,500**	4910 **10,600**			5570 **12,400**	3810 **8500**	9.0 **29.4**
-4.5 m **-15.0 ft**	kg **lb**			*20 310 ***44,300**	*20 310 ***44,300**	*13 960 ***30,000**	11 160 **24,000**	*10 180 ***21,800**	7060 **15,200**	7350	5060					

Indicates the load is limited by hydraulic capacity rather than tipping capacity. Lift capacity ratings are based on SAE Standard J1097. Rated loads do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity.

231D LC Excavator

STICK -- 2900 mm/9'6"
BUCKET -- 1375 mm/54"
BOOM -- ONE-PIECE

UNDERCARRIAGE -- 5230 mm/17'2"
TRACK SHOE -- 813 mm/32"
HEAVY LIFT CIRCUIT -- ACTIVATED

LOAD POINT HEIGHT		LOAD RADIUS 3.0 m/10.0 ft OVER FRONT	3.0 m/10.0 ft OVER SIDE	4.5 m/15.0 ft OVER FRONT	4.5 m/15.0 ft OVER SIDE	6.0 m/20.0 ft OVER FRONT	6.0 m/20.0 ft OVER SIDE	7.5 m/25.0 ft OVER FRONT	7.5 m/25.0 ft OVER SIDE	9.0 m/30.0 ft OVER FRONT	9.0 m/30.0 ft OVER SIDE	LOAD AT MAXIMUM REACH OVER FRONT	OVER SIDE	m ft
9.0 m 30.0 ft	kg lb											*3950 *8800	*3950 *8800	7.9 25.4
7.5 m 25.0 ft	kg lb							*5260 *11,700	*5260 *11,700			*3710 *8200	*3710 *8200	9.2 29.8
6.0 m 20.0 ft	kg lb							*5440 *11,900	*5440 *11,900			*3660 *8100	3410 7600	10.0 32.5
4.5 m 15.0 ft	kg lb			*8940 *19,100	*8940 *19,100	*6990 *15,100	*6990 *15,100	*6070 *13,200	5480 11,800	*5680 *12,500	3870 8200	*3740 *8200	3030 6700	10.4 34.1
3.0 m 10.0 ft	kg lb			*12 290 *26,200	11 620 25,100	*8560 *18,400	7490 16,100	*6910 *15,000	5220 11,200	*6070 *13,200	3760 8000	*3930 *8600	2840 6300	10.6 34.6
1.5 m 5.0 ft	kg lb			*13 540 *31,700	10 700 23,100	*9990 *21,500	7010 15,100	*7730 *16,700	4960 10,700	*6510 *14,100	3640 7800	*4250 *9400	2820 6200	10.5 34.3
Ground Line	kg lb			*14 480 *33,800	10 360 22,300	*10 920 *23,600	6710 14,400	*8350 *18,100	4770 10,200	*6830 *14,800	3540 7600	*4770 *10,500	2970 6500	10.1 33.0
-1.5 m -5.0 ft	kg lb	*9740 *22,000	*9740 *22,000	*15 690 *33,900	10 320 22,200	*11 250 *24,300	6590 14,200	*8610 *18,600	4690 10,100			*5610 *12,400	3360 7400	9.4 30.7
-3.0 m -10.0 ft	kg lb	*16 010 *36,200	*16 010 *36,200	*14 900 *32,200	10 470 22,500	*10 920 *23,600	6630 14,300	*8270 *17,700	4730 10,200			*4940 *10,700	4210 9400	8.3 27.0
-4.5 m -15.0 ft	kg lb	*18 610 *40,000	*18 610 *40,000	*13 050 *28,000	10 810 23,200	*9530 *20,300	6860 14,800							

STICK -- 3500 mm/11'6"
BUCKET -- 1375 mm/54"
BOOM -- ONE-PIECE

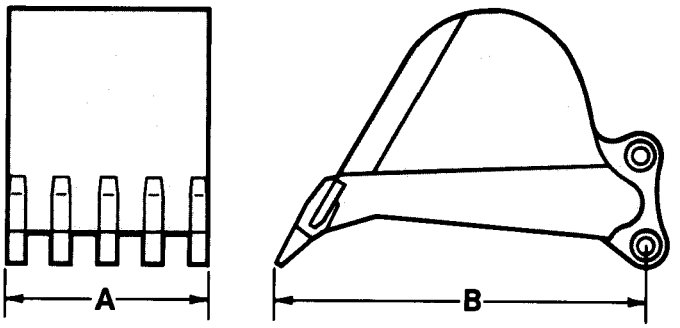
UNDERCARRIAGE -- 5230 mm/17'2"
TRACK SHOE -- 813 mm/32"
HEAVY LIFT CIRCUIT -- ACTIVATED

LOAD POINT HEIGHT		LOAD RADIUS 1.5 m/5.0 ft OVER FRONT	1.5 m/5.0 ft OVER SIDE	3.0 m/10.0 ft OVER FRONT	3.0 m/10.0 ft OVER SIDE	4.5 m/15.0 ft OVER FRONT	4.5 m/15.0 ft OVER SIDE	6.0 m/20.0 ft OVER FRONT	6.0 m/20.0 ft OVER SIDE	7.5 m/25.0 ft OVER FRONT	7.5 m/25.0 ft OVER SIDE	9.0 m/30.0 ft OVER FRONT	9.0 m/30.0 ft OVER SIDE	LOAD AT MAXIMUM REACH OVER FRONT	OVER SIDE	m ft
9.0 m 30.0 ft	kg lb													*3170 *7000	*3170 *7000	8.7 28.0
7.5 m 25.0 ft	kg lb									*4480 *9900	*4480 *9900			*2990 *6600	*2990 *6600	9.8 32.0
6.0 m 20.0 ft	kg lb									*4790 *10,500	*4790 *10,500	*4860 *10,000	3990 8500	*2950 *6500	*2950 *6500	10.5 34.5
4.5 m 15.0 ft	kg lb							*6170 *13,300	*6170 *13,300	*5480 *11,900	*5480 *11,900	*5150 *11,300	3920 8400	*3010 *6600	2720 6000	11.0 35.9
3.0 m 10.0 ft	kg lb					*10 890 *23,300	*10 890 *23,300	*7810 *16,800	7640 16,400	*6380 *13,800	5270 11,300	*5630 *12,300	3780 8100	*3160 *7000	2550 5600	11.1 36.4
1.5 m 5.0 ft	kg lb					*13 760 *29,600	10 990 23,700	*9380 *20,200	7110 15,300	*7300 *15,800	4980 10,700	*6150 *13,400	3630 7800	*3430 *7500	2520 5600	11.0 36.1
Ground Line	kg lb			*5040 *11,500	*5040 *11,500	*15 300 *33,000	10 440 22,400	*10 530 *22,700	6730 14,500	*8040 *17,400	4760 10,200	*6590 *14,300	3500 7500	*3840 *8500	2640 5800	10.6 34.9
-1.5 m -5.0 ft	kg lb	*6350 *14,200	*6350 *14,200	*9030 *20,400	*9030 *20,400	*15 730 *34,000	10 270 22,000	*11 110 *24,000	6550 14,100	*8470 *18,300	4630 9900	*6780	3440	*4510 *10,000	2940 6500	10.0 32.8
-3.0 m -10.0 ft	kg lb	*10 260 *23,000	*10 260 *23,000	*13 810 *31,200	*13 810 *31,200	*15 320 *33,100	10 330 22,200	*11 060 *23,900	6530 14,000	*8420 *18,100	4610 9900			*5650 *12,600	3580 7900	9.0 29.4
-4.5 m -15.0 ft	kg lb			*20 310 *44,300	*20 310 *44,300	*13 960 *30,000	10 580 22,700	*10 180 *21,800	6670 14,400	*7400	4760					

Indicates the load is limited by hydraulic capacity rather than tipping capacity. Lift capacity ratings are based on SAE Standard J1097. Rated loads do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity.

Bucket Specifications

Caterpillar buckets curl 174° for excellent load retention and easy digging under obstructions. High-strength, heat-treated steel is used in the primary wear areas.



Bucket Selection
(equipped with long tips with tip adapters)

Type	A Bite Width mm/in.	B Tip Radius mm/in.	SAE and PCSA Heaped Capacity liter/yd³	Weight With Tips kg/lb	Number of Teeth
T	1050/41	1730/68.1	1119/1.38	956/2,105	4
X	1200/47	1660/65.4	1200/1.50	1035/2,280	5
X	1345/53	1660/65.4	1387/1.75	1108/2,440	5
X	1420/56	1660/65.4	1486/1.88	1147/2,525	5
X*	1375/54	1570/61.8	1351/1.75	1007/2,218	5
X*	1531/60	1570/61.8	1531/2.0	1071/2,358	6
LX	1675/66	1311/51.6	1587/2.0	995/2,190	--

T = Trenching, X = Excavation and LX = Loose Material Excavation.
* Not intended for use in rocky soil.

Stick and Bucket Forces

Bucket Tip Radius mm/in	Bucket Curling Forces kN/lb	Stick Crowd Forces	
		2900 mm/9'6" Stick kN/lb	3500 mm/11'6" Stick kN/lb
1311/51.6	214.9/48,300	140.6/31,600	122.9/27,600
1570/61.8	179.3/40,300	135.3/30,400	118.6/26,700
1660/65.4	169.5/38,100	131.4/29,500	115.7/26,000
1730/68.1	162.9/36,500	129.3/29,100	114.1/25,600

Benefits Summary

149 kW/200Hp Cat Turbocharged Diesel Engine ... provides fast cycles and high productivity. A tough, durable engine ... field-proven in many applications.

Two-speed track motors ... high speed for fast travel around and between job sites ... low speed for maximum drawbar pull and maneuvering in poor underfoot conditions.

Automatic Engine Speed Control ... automatically selects one of three engine RPM settings, according to load ... contributes up to 20% fuel savings.

High 29 660 kPa/4,300 psi hydraulic working pressure ... for aggressive digging capability when working in tough ground conditions.

New-design track rollers specifically for excavators ... deliver maximum durability in high impact applications.

Constant-horsepower hydraulic system ... with variable-displacement piston pumps and hydraulic power proportioning, coupled to Cat's XT-5 hose, makes the 231D Excavator fuel efficient and very reliable.

Human-engineered cab ... the sound-suppressed cab features heavy duty construction with 11-gauge sheet steel and a box-section frame. The 926 mm/36" inside cab width provides extra room for shift-long operator comfort. The 231D's two-section windshield adjusts to five different visibility/ventilation combinations to maximize operator comfort and productivity. It has tinted, laminated glass in the upper window and clear, tempered glass in the lower window. Tinted side and rear windows enhance visibility. The four-way adjustable seat has joysticks and switches mounted on side consoles, placing the controls within comfortable reach. An angled gauge panel allows the operator to monitor selected machine systems with a glance. A cab heater is standard.

Controls respond smoothly and easily for prescise work ... boosted by a hydraulic-over-hydraulic pilot system for easy, well-modulated lever movement. Prevents surges common to air-over-hydraulic controls, and reduces high lever efforts common to mechanically controlled systems. Hand control boosts boom-raise and stick-out speeds.

Track-type undercarriage designed and built by Caterpillar, the world's most experienced manufacturer of track-type vehicles ... delivers rugged performance and long life with a minimum of undercarriage service. Outstanding drawbar pull helps the 231D maneuver and travel in poor underfoot conditions and on steep slopes. Track pins and bushings are sealed with metal-to-metal discs ... the rollers and idlers, with Caterpillar's Duo-Cone Seals. Hydraulic track adjusters and heavy duty recoil springs are standard equipment. The track roller frames use box-beam construction. Bolt-on track shoes are available in several widths.

Powerful, dependable hydraulic components ... deliver high flows for rapid lift, swing and dump functions or high pressure for maximum digging forces. Major components are Cat turbocharged 3208 Engine; twin, variable-displacement piston pumps; single-section, fixed-displacement, gear pump; piston-type track motors; Cat's XT-5 hose and couplings; heavy steel tubing and pilot control valves; Cat hydraulic cylinders; and hydraulic tank.

Remote, centralized grease fittings ... allow easy lubrication of hard-to-reach lube points.

CATERPILLAR

AEHQ8953 (6-89)