

VOLVO WHEEL LOADER

L220D



- **Engine output SAE J1995:** power, gross 259 kW (352 hp)
ISO 9249, SAE J1349: power, net 257 kW (349 hp)
 - **Operating weight:** 30,5–33,0 t
 - **Bucket volume:** 4,5–14,0 m³
 - **Volvo high performance low emission engine**
 - excellent low rpm performance
 - meets all known exhaust emission regulations for off road vehicles until year 2002
 - **Care Cab II**
 - 2nd generation Care Cab, pressurized cab with high comfort and safety
 - **Volvo transmission with APS II**
 - 2nd generation Automatic Power Shift with mode selector and PWM-valves
 - **Wet disc brakes**
 - fully sealed oil circulation cooled, outboard mounted
 - **Torque Parallel Linkage**
 - high breakout torque throughout the working range
 - excellent parallel lift-arm action
 - **Contronic II**
 - 2nd generation monitoring system
 - **Load-sensing working hydraulics and steering system**
 - **Pilot-operated working hydraulics**
- Optional Equipment**
- Boom Suspension System
 - Comfort Drive Control
 - Hydraulic attachment bracket
 - Long boom

VOLVO



SERVICE

The Contronic II monitoring system provides information on scheduled service intervals and machine condition. Minimizes time required for troubleshooting.

Service accessibility: Large, easy-to-open service doors with gas springs. Swing-out radiator grille, fan and radiator.

Refill capacities

Fuel tank	331 l
Engine coolant	83 l
Hydraulic oil tank	165 l
Transmission oil	45 l
Engine oil	52 l
Axles front/rear	77/71 l



ENGINE

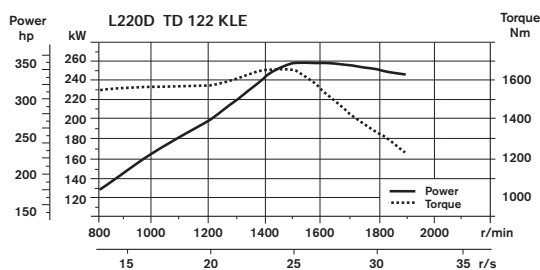
The Volvo engine offers high torque and quick response at low rpm. The machine operates efficiently at low engine speeds which contributes to good fuel economy, less noise, reduced wear and longer life.

Engine: High performance – Low emission, 4-stroke, 6-cylinder in-line diesel engine with direct injection, turbo charger and intercooler. Wet replaceable cylinder liners.

Air cleaning: three-stage

Cooling system: Hydrostatic fan with separate circuit for the intercooler.

Engine	Volvo TD 122 KLE
Max power at	26,7 r/s (1600 r/m)
SAE J1995 gross	259 kW (352 hp)
ISO 9249, SAE J1349	257 kW (349 hp)
Rated power at	32,0 r/s (1900 r/m)
SAE J1995 gross	247 kW (336 hp)
ISO 9249, SAE J1349	244 kW (332 hp)
Max torque at	24,2 r/s (1450 r/m)
SAE J1995 gross	1660 Nm (1224 lbf ft)
ISO 9249, SAE J1349	1645 Nm (1213 lbf ft)
Displacement	12 l



ELECTRICAL SYSTEM

Contronic II monitoring system with increased function control. Electrical system with circuit boards, well protected by fuses. The system is pre-wired for installation of optional equipment.

Central warning system: Central warning light for the following functions, (buzzer with gear engaged): Engine oil pressure, transmission oil pressure, brake pressure, parking brake, hydraulic oil level, axle oil temperature, steering system pressure, coolant temperature, transmission oil temperature, hydraulic oil temperature, overspeeding transmission, low brake pressure.

Voltage	24 V
Batteries	2x12 V
Battery capacity	2x170 Ah
Cold cranking capacity, approx	1150 A
Reserve capacity, approx	350 min
Alternator rating	1680 W/60A
Starter motor output	6,6 kW (9,0 hp)



DRIVETRAIN

The drivetrain and working hydraulics are well-matched and of reliable design. Quick acceleration increases productivity. Extensive Volvo component coordination facilitates service work.

Torque converter: single-stage

Transmission: Volvo Countershaft-type transmission with single lever control. Fast and smooth shifting of gears between forward and reverse with PWM-valves (Pulse Width Modulated).

Gearshifting system: Volvo Automatic Power Shift (APS II) with mode selector.

Axles: Volvo, fully floating axle shafts with planetary-type hub reductions. Cast steel axle housing. Fixed front axle and oscillating rear axle. 100% differential lock on the front axle.

Transmission	Volvo HTE 300
Torque multiplication	2,1:1
Maximum speed, forward/reverse	
1	7,3 km/h
2	11,7 km/h
3	23,4 km/h
4	34,2 km/h
Measured with tires	29.5 R25 L3
Front axle/rear axle	Volvo/AWB 50/41
Rear axle oscillation	± 15 °
Ground clearance at 15° oscillation	610 mm



BRAKE SYSTEM

A simple and reliable brake system with few moving parts. Self-adjusting oil circulation cooled wet disc brakes give long service intervals. Brake wear indicator and brake test in Contronic II are included in the brake system.

Service brake: Volvo dual-circuit system with nitrogen-charged accumulators. Outboard mounted fully hydraulic operated, fully sealed oil circulation cooled wet disc brakes. The operator can select automatic declutch of the transmission when braking by a switch on the instrument panel.










Parking brake: Fully sealed, wet multi-disc brake built into the transmission. Applied by spring force, electro-hydraulic release with a switch on the instrument panel.

Secondary brake: Dual brake circuits with rechargeable accumulators. One circuit or the parking brake fulfill all safety requirements.

Standard: The brake system complies with the requirements of ISO 3450 and SAE J1473.

Number of brake discs per wheel front/rear	2/1
Accumulators	2x1,0 l and 1x0,5 l
Accumulator for parking brake	1x0,5 l

OPERATIONAL DATA VOLVO L220D

	GENERAL PURPOSE					ROCK*		LIGHT MTRL		LONG BOOM
										
Tires 29.5 R25 L4 Pin-on buckets	Teeth & Segments	Teeth & Segments	Bolt-on edges	Bolt-on edges	Bolt-on edges	Teeth & Segments	Teeth & Segments	Bolt-on edges	Bolt-on edges	
Volume, heaped ISO/SAE m ³	4,6	4,9	5,2	5,4	5,6	4,5	4,5	8,2	9,5	---
Volume at 110% fill factor m ³	5,1	5,4	5,7	5,9	6,2	5,1	5,0	9,0	10,5	---
Static tipping load, straight kg	23 480	23 350	23 340	23 360	23 200	23 590	24 050	22 200	22 670	-2 780
at 35° turn kg	20 790	20 670	20 660	20 670	20 510	20 860	21 290	19 570	20 030	-2 540
at full turn kg	20 490	20 360	20 360	20 370	20 200	20 550	20 970	19 270	19 740	-2 510
Breakout force kN	236,3	229,2	222,9	222,9	218,3	190,9	238,7	171,3	166,8	---
A mm	9 070	9 120	8 960	8 960	8 990	9 430	9 060	9 410	9 470	+310
E mm	1 400	1 440	1 300	1 300	1 330	1 720	1 400	1 710	1 750	-20
H ^{***}) mm	3 230	3 200	3 300	3 300	3 270	3 060	3 230	2 960	2 930	+360
L mm	6 360	6 410	6 470	6 510	6 560	6 350	6 410	6 490	6 590	+360
M ^{***}) mm	1 340	1 380	1 240	1 250	1 270	1 710	1 340	1 560	1 600	-30
N mm	2 090	2 110	2 020	2 020	2 030	2 250	2 080	2 150	2 160	+270
V mm	3 430	3 430	3 400	3 400	3 400	3 430	3 430	3 700	3 700	---
a ₁ clearance circle mm	15 160	15 180	15 070	15 070	15 090	15 360	15 160	15 590	15 620	---
Operating weight kg	31 057	31 146	31 131	31 215	31 355	32 612	32 410	31 614	31 148	+190

*) with L5 tires






***) Measured to the tip of the bucket teeth or bolt-on edge. Dump height to bucket edge (acc. SAE) + approx. 200mm. Measured at 45° dump angle. (Spade nose buckets at 42°.)

BUCKET SELECTION CHART

The choice of bucket is determined by the density of the material and the expected bucket fill factor. The actual bucket volume is often larger than the rated capacity, due to the TP Linkage features: • Open bucket design. • Very good roll back in all positions. • Good bucket fill performance.

The below example and table are intended for Standard boom.

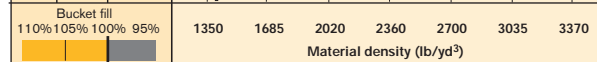
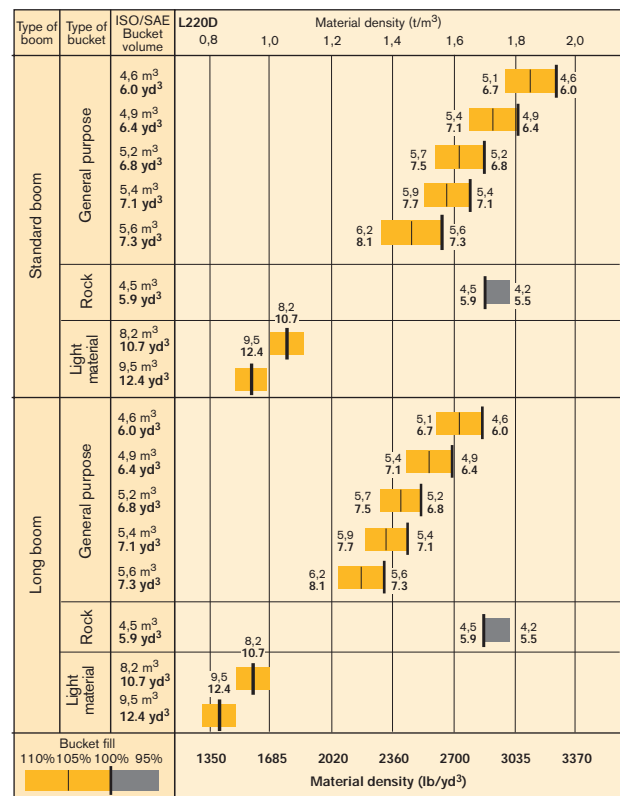
Example: Sand and gravel. Fill factor ~ 105%. Density 1,65 t/m³. Result: The 4,9 m³ bucket carries 5,1 m³. For optimum stability always consult the bucket selection chart.

Material	Bucket fill, %		Material density, t/m ³	ISO/SAE bucket volume, m ³	Actual volume, m ³
Earth/Clay	~ 110		~ 1,60	4,6	~ 5,1
			~ 1,55	4,9	~ 5,4
			~ 1,50	5,2	~ 5,7
Sand/Gravel	~ 105		~ 1,70	4,6	~ 4,8
			~ 1,65	4,9	~ 5,1
			~ 1,60	5,2	~ 5,4
Aggregate	~ 100		~ 1,80	4,6	~ 4,6
			~ 1,70	4,9	~ 4,9
			~ 1,65	5,2	~ 5,2
Rock	≤ 100		~ 1,70	4,5	~ 4,5

The size of rock buckets is optimized for optimal penetration and filling capability rather than the density of the material.

SUPPLEMENTAL OPERATING DATA

		Standard boom		Long boom	
		29.5 R25 L3	29.5 R25 L5	29.5 R25 L3	29.5 R25 L5
Tires 29.5 R25 L4					
Width over tires mm		-20	+70	-20	+70
Ground clearance mm		-24	+30	-24	+30
Tipping load, full turn kg		-244	+800	-230	+730
Operating weight kg		-432	+1 132	-432	+1 132



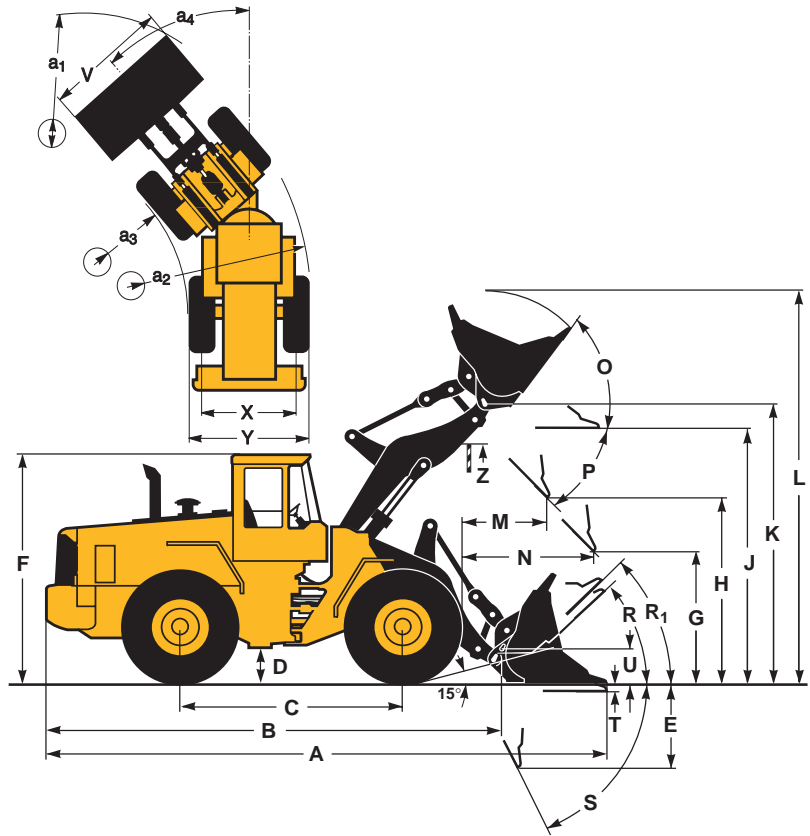
OPERATIONAL DATA & DIMENSIONS

Tires: 29.5 R25 L4

	Standard boom	Long boom
B	7 300 mm	7 610 mm
C	3 550 mm	—
D	510 mm	—
F	3 730 mm	—
G	2 132 mm	—
J	4 290 mm	4 650 mm
K	4 690 mm	5 050 mm
O	56 °	—
P _{max}	47 °	47 °
R	43 °	44 °
R ₁ *	47 °	—
S	65 °	62 °
T	70 mm	—
U	610 mm	—
X	2 400 mm	—
Y	3 170 mm	—
Z	3 970 mm	3 940 mm
a ₂	6 890 mm	—
a ₃	3 720 mm	—
a ₄	±37 °	—

* Carry position SAE

Where applicable, specifications and dimensions are in accordance with ISO 7131, SAE J732, ISO 7546, SAE J742, ISO 5998, SAE J818, ISO 8313.

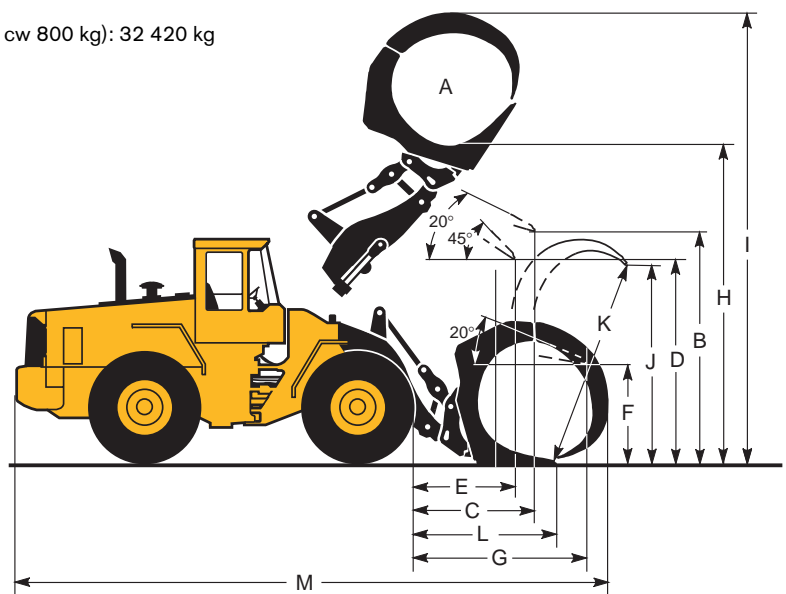


LOG GRAPPLE (hook on)

Tires: 29.5 R25 L4

A	3,7	m ²
B	3 960	mm
C	2 230	mm
D	3 200	mm
E	1 740	mm
F	1 660	mm
G	3 220	mm
H	5 380	mm
I	7 870	mm
J	3 370	mm
K	3 650	mm
L	2 590	mm
M	10 120	mm

Operating weight (incl. logging cw 800 kg): 32 420 kg
Operating load: 9 300 kg





STEERING SYSTEM

Easily operated steering results in fast work cycles. The power-efficient system results in good fuel economy, good directional stability and a smooth ride.

Steering system: Load-sensing hydrostatic articulated steering.

System supply: The steering system has priority feed from a load-sensing axial piston pump.

Pump: Axial piston pump with variable displacement.

Steering cylinders: Two double-acting cylinders.

Steering cylinders	2
Cylinder bore	100 mm
Piston rod diameter	50 mm
Stroke	458 mm
Relief pressure	21 MPa
Maximum flow	170 l/min
Maximum articulation	± 37°



CAB

Care Cab II with wide door opening and comfortable instep. Inside of cab lined with noise-absorbent materials. Noise and vibration suppressing suspension. Good all-round visibility through large glass areas. Curved front windshield of green-tinted glass. Ergonomically positioned controls and instruments permit a comfortable operating position.

Instrumentation: All important information is centrally located in the operator's field of vision. Display for Contronic II monitoring system.

Heater and defroster: Heater coil with filtered fresh air and fan with four speeds. Defroster vents for all window areas.

Operator's seat: Operator's seat with adjustable suspension and retractable seatbelt. The seat is mounted on a bracket on the rear cab wall. The forces from the retractable seatbelt are absorbed by the seat rails.

Standard: The cab is tested and approved according to ROPS (ISO/CD 3471, SAE J1040), FOPS (ISO 3449, SAE J231). The cab meets with requirements according to ISO 6055 ("protective roof for high-lift vehicles") and SAE J386 ("Operator Restraint System").

Emergency exits	2
Sound level in cab	
according to ISO 6396	LpA 75dB (A)
External sound level	
according to ISO 6395	LwA 109dB (A)
(meets also EU 2006 requirements)	
Ventilation	9 m ³ /min
Heating capacity	11 kW
Air conditioning (optional)	8 kW



HYDRAULIC SYSTEM

The Load-sensing hydraulics deliver the exact amount of oil required for the function used. At the same time, complete control of the hydraulics is achieved throughout the entire lifting range. The high capacity of the pumps results in quick and smooth movements.

System supply: Two load-sensing axial piston pumps with variable displacement. The steering function always has priority from one of the pumps.

Valves: Double-acting 2-spool valve. The main valve is controlled by a 2-spool pilot valve.

Lift function: The valve has four positions; raise, hold, lower and float position. Inductive/magnetic automatic boom kickout can be switched on and off and is adjustable to any position between maximum reach and full lifting height.

Tilt function: The valve has three functions; rollback, hold and dump. Inductive/magnetic automatic tilt can be adjusted to the desired bucket angle.

Cylinders: Double-acting cylinders for all functions.

Filter: Full flow filtration through 20 micron (absolute) filter cartridge.

Relief pressure maximum, pump 1	25,0 MPa
Flow	225 l/min
at	10 MPa
and engine speed	31,7 r/s (1900 r/min)
Relief pressure, pump 2	26 MPa
Flow	170 l/min
at	10 MPa
and engine speed	31,7 r/s (1900 r/min)
Pilot system	
Relief pressure	3,5 MPa
Cycle times	
Raise*	6,4 s
Tilt*	1,7 s
Lower, empty	3,2 s
Total cycle time	11,3 s

* with load as per ISO 5998 and SAE J818



LIFT ARM SYSTEM

The TP Linkage combines high breakout torque throughout the working range with nearly exact parallel lift-arm action. These features together with the high lifting height and long reach, make the lift-arm system equally as good for bucket loading as for log handling.

Lift cylinders	2
Cylinder bore	190 mm
Piston rod diameter	90 mm
Stroke	768 mm
Tilt cylinder	1
Cylinder bore	260 mm
Piston rod diameter	120 mm
Stroke	455 mm

STANDARD EQUIPMENT

Engine

Three stage air cleaner with ejector and inner filter
Indicator glass for coolant level
Preheating of induction air
Water separator with filter
Hydrostatically driven fan
Two fuel filters

Electrical system

Alternator, 24 V/60 A
Battery disconnect switch
Fuel gauge
Hour meter
Electric horn
Instrument panel with symbols
Lighting:
• Twin halogen front headlights with high and low beams
• Parking lights
• Double brake and tail lights
• Turn signals with flashing hazard light function
• Halogen working lights (2 front and 2 rear)
• Instrument lighting

Contronic II, monitoring system, ECU with log and analysis system

Contronic II display
Engine shutdown to idle in case of malfunction indication:
• High engine coolant temperature

- Low engine oil pressure
 - High transmission oil temperature
 - Clutch slippage in transmission
- Start interlock when gear is engaged
Brake test
Test function for warning and indicator lights
Warning and indicator lights:
• Charging
• Oil pressure engine
• Oil pressure, transmission
• Brake pressure
• Parking brake
• Hydraulic oil level
• Axle oil temperature
• Primary steering
• Secondary steering
• High beams
• Turn signals
• Rotating beacon
• Preheating coil
• Differential lock
• Coolant temperature
• Transmission oil temperature
• Brake charging

Drivetrain

Automatic Power Shift II with operator-controlled declutch function for transmission cut-out when braking
PWM-control between different gear positions
Forward and reverse switch by lever console

Differentials:
front: 100% hydraulic diff lock
rear: conventional
Tires: 29.5 R25 or 29.5-25

Brake system

Wet oil circulation cooled disc brakes on all four wheels
Dual brake circuits
Secondary brake system

Cab

ROPS (SAE J1040CC, ISO 3471), FOPS (SAE J231, ISO 3449)
Acoustic inner lining
Ashtray
Cigarette lighter
Lockable door
Cab heating with filter, fresh-air inlet and defroster
Floor mat
Interior lights
Interior rear-view mirror
2 exterior rear-view mirrors
Openable window right-hand side
Tinted safety glass
Hip retractable seatbelt (SAE J386)
Adjustable lever console
Ergonomically designed operator's seat with adjustable suspension
Storage compartment
Sun visor
Beverage holder
Windshield washers front and rear
Windshield wipers front and rear
Interval function for front and rear

windshield wipers
Service platforms with anti-slip surfaces on front and rear fenders
Speedometer

Hydraulic system

Main valve, 2-spool
Pilot valve, 2-spool
Variable displacement axial piston pumps (3) for:
• working hydraulics
• steering system, pilot hydraulics and brakes
• fan motor
Boom lowering system
Bucket lever detent
Bucket lever, automatic with position indicator, adjustable
Test connections with quick-couplings for checking hydraulic pressure
Indication of hydraulic oil level and hydraulic oil temperature
Hydraulic oil cooler

External equipment

Noise and vibration dampening suspension of cab, engine and transmission
Lifting lugs
Easy-to-open side panels and engine hood
Frame steering, joint lock
Vandalism lock prepared for batteries and engine oil
Towing hitch

OPTIONAL EQUIPMENT *(Standard on certain markets)*

Service and maintenance

Tool box, lockable
Tool kit
Automatic lubrication
Automatic lubrication of attachment bracket
Refill pump for auto lub system
Wheel nut wrench kit

Engine equipment

Coolant filter
Engine block heater
Oil bath pre-cleaner
Turbo air cleaner
Fuel strainer
Fuel filter (extra large, with water trap)

Electrical system

Acoustic back-up signal
Attachment working lights
Extra working lights front
Extra working lights rear
Alternator, 80 A
Assymetrical lights for left-hand traffic
Rotating beacon, collapsible

Cab

Radio installation kit incl., power outlet 12 V
Radio with tape recorder
Sunblinds, front and rear windows
Sunblinds, side windows
Installation kit for radio
Hand-operated throttle
Sliding window, right
Sliding window, door
Retractable hipbelt, longer and wider than standard
Air conditioning
Dual service brake pedals
Ventilation air filter for work in asbestos environment
Operator's seat with short backrest
Operator's seat air suspended with high backrest and electrical heating
Instructor's seat
Adjustable steering wheel
Armrest (left) for ISRI operator seat
Lunchbox holder
Steering knob
Noise reduction kit

Drivetrain

Limited slip, rear

Hydraulic system

3rd hydraulic function
3rd/4th hydraulic function
Boom Suspension System
Biodegradable hydraulic fluid
Attachment bracket
Arctic kit
Arctic kit, attachment locking hoses
Separate attachment locking standard boom
Separate attachment locking long boom

External equipment

Long boom
Axle-mounted sheet metal fenders
Swing-out rear fender
Counterweight logging

Protective equipment

Guards for front headlights
Guards for taillights
Guards for working lights rear

Guards for side windows and rear window
Windshield guard
Protective grids for rear lights
Bellyguard front and rear
Cover plate front frame

Other equipment

Lever steering (CDC)
Secondary steering
External brake oil cooling

Tires

29.5-25, 29.5 R25
875/65R29

Attachments

Buckets:
• Straight with/without teeth
• Spade nose with/without teeth
• High tipping
• Light materials
Log grapples
Cutting edge in three sections, bolt-on
Bolt-on and weld-on bucket teeth
Segments, reversible

Under our policy of continuous product development and improvement, we reserve the right to change specifications and design without prior notice. The illustrations do not necessarily show the standard version of the machine.

VOLVO

Volvo Construction Equipment Group

Ref. No. 21 6 669 2286 English
Printed in Sweden 2000-05 3,0 WLO
Volvo, Eskilstuna