

VOLVO WHEEL LOADER

L90D



- **Engine output SAE J1349:**
gross 118 kW, 160 hp
net 113 kW, 153 hp
 - **Operating weight:** 14,9–16,7 t
32,850–36,820 lb
 - **Buckets:** 2,2–7,0 m³
2.9–9.2 yd³
 - **Volvo high-performance, low-emission engine** with excellent low rpm performance. The engine meets all known regulations regarding exhaust emissions for off-road vehicles.
 - **Volvo transmission with APS II**, Second generation of Automatic Power Shift with mode (shift pattern) selector for optimum performance and fuel consumption.
 - **Wet disc brakes**
 - Fully sealed, oil circulation-cooled, wet disc brakes, outboard-mounted.
 - **Torque Parallel Linkage**
 - high breakout torque throughout the working range
 - excellent parallel lift-arm action
 - **Care Cab II** – pressurized cab with high comfort and safety
 - **Contronic II** monitoring system
 - **Load-sensing steering system**
 - **Pilot-operated working hydraulics**
- Optional Equipment**
- Hydraulic attachment bracket
 - Boom Suspension System
 - Comfort Drive Control
- Other options, see back page**

VOLVO



SERVICE

The Contronic II monitoring system provides information on machine condition, routine maintenance schedules and minimizes time required for troubleshooting.

Service accessibility: Large, easy-to-open engine access doors with gas struts. Hinged radiator grill and swing-out radiator.

Refill capacities	l	US gal
Fuel tank	210	55.5
Engine coolant	53	14.0
Hydraulic tank	130	34.3
Transmission	33	8.7
Engine oil	16	4.2
Axle front / rear	36/41	9.5/10.8



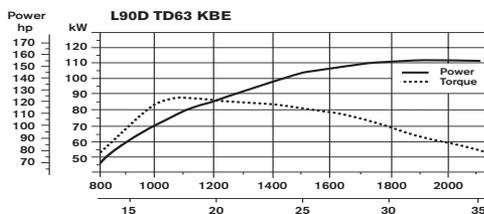
ENGINE

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

Engine: High-performance, low-emission, 4-stroke, 6-cylinder, in-line diesel engine with direct injection, turbocharger and intercooler with separate water pump circuit. Wet replaceable cylinder liners.

Air cleaning: Three-stage

Engine	Volvo TD 63 KBE
Max power at	35 r/s 2100 rpm
SAE J1995 gross	118 kW 160 hp
ISO 9249, SAE J1349 net ...	113 kW 153 hp
Max. torque at	18,3 r/s 1100 rpm
SAE J1995 gross	695 Nm 513 lbf ft
ISO 9249, SAE J1349 net ...	690 Nm 509 lbf ft
Displacement	5,48 l 334 in³



ELECTRICAL SYSTEM

Contronic II monitoring system with increased function capability. 24-Volt electrical system with fuse-protected circuitry. 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 on, hydraulic oil level, axle oil temperature, steering system pressure, coolant temperature, transmission oil temperature, hydraulic oil temperature, overspeeding in engaged gear, brake charging.

Voltage	24	V
Batteries	2x12	V
Battery capacity	2x105	Ah
Cold cranking capacity	690	A
Reserve capacity	185	min
Alternator rating	1 680	W / 60 A
Starter-motor output	5,4	kW 7.3 hp



DRIVETRAIN

Rugged Volvo drivetrain is well matched to working hydraulics. Quick acceleration increases productivity. Extensive Volvo component coordination facilitates easy service work.

Torque converter: Single-stage

Transmission: Volvo Countershaft-type transmission with single lever control. Fast and smooth directional and speed shifting.

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

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

Transmission	Volvo HT 131
Torque multiplication	2,66:1
Speeds	
max forward / reverse	km/h mph
1	7,1 4.4
2	13,3 8.3
3	27,7 17.2
4	38,2 23.7
Measured with tires	20.5 R25* L2
Front and rear axle	Volvo / AWB 30
Rear axle oscillation	± 15°
Ground clearance at 15° oscillation	510 mm 19.9 in x 20.0



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 brakes: Volvo, dual-circuit system with nitrogen-charged accumulators. Outboard-mounted, fully hydraulically operated, fully sealed oil circulation-cooled, wet disc brakes. Operator selectable transmission declutch function.

Parking brake: Mechanically operated disc brake on transmission output shaft to front axle.

Secondary brake: Either of the service brake circuits or the parking brake fulfills ISO/SAE safety requirements.

Standards: The brake system complies with the requirements of ISO 3450, SAE J1473

Number of discs/wheel	1
Number of accumulators	2
Volume, each	1,0 l 61 in³



STEERING SYSTEM

Low-effort steering gives short work cycle times. Power-efficient system provides good fuel economy, good directional stability and smooth ride.

Steering system: Load-sensing hydrostatic articulated steering.

System supply: The steering system is supplied from a separate steering pump.

Pump: Axial piston pump with variable displacement.

Cylinders: Two double-acting cylinders.

Steering cylinders	2			
Bore	70 mm	2.8	in	
Piston rod diameter	40 mm	1.6	in	
Stroke	419 mm	16.5	in	
Relief pressure	21 MPa	3046	psi	
Max. flow	91 l / min	24.0	US gpm	
Articulation	±40°			



CAB

Care Cab II with wide door opening for easy entry. Inside of cab lined with noise-absorbent materials. Noise and vibration suppressing suspension. Good all-round visibility through large glass areas. Curved windshield has 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. Center console display for Contronic II monitoring system.

Heater and defroster: Heating element 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 force from the retractable seatbelt are absorbed by the seat rails.

Standards: 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, SAEJ 2105	LpA 75 dB(A)			
External sound level				
According to ISO 6396, SAEJ 2104	LwA 108 dB(A)			
with sound reduction kit,				
EU 2006 requirements	LwA 105 dB(A)			
Ventilation	9 m ³ /min	318ft³/min		
Heating capacity	11 kW	37,500 Btu/h		
Air conditioning (optional)	8 kW	27,300 Btu/h		



HYDRAULIC SYSTEM

Open center hydraulics with efficient high-capacity vane pump allow precision control and quick movements, even at low engine speed.

Pump: Vane pump fitted to a power take-off on the transmission. The pilot system is supplied from a combined pilot/brake pump, which is mounted in series with the steering pump.

Valve: Double-acting 3-spool valve. Actuated by a 3-spool pilot valve. 3rd spool for optional 3rd hydraulic function.

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

Tilt function: The valve has three functions: rollback, hold and dump. Adjustable inductive/magnetic automatic bucket positioner that can be switched on and off.

Cylinders: Double-acting

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

Vane pump				
Relief pressure	22,5 MPa	3263	psi	
Flow	202 l/min	53	US gpm	
at	10 MPa	1450	psi	
and engine speed	35 r/s	2100	rpm	
Pilot system				
Relief pressure	3,0 MPa	435	psi	
Cycle times	s			
Raise*	5,5			
Dump*	1,9			
Lower, empty	2,3			
Total cycle time	9,7			

* with load as per ISO 5998 and SAE J818



LIFT-ARM SYSTEM

TP Linkage combines high breakout torque throughout the working range with parallel lift-arm action. These features, together with good visibility, high lift height and long reach, make the lift-arm system equally good in bucket loading and work with fork attachments and material handling arms.

Lift cylinder	2			
Bore	130 mm	5.1	in	
Piston rod diameter	70 mm	2.8	in	
Stroke	710 mm	28.0	in	
Tilt cylinder	1			
Bore	190 mm	7.5	in	
Piston rod diameter	90 mm	3.5	in	
Stroke	430 mm	16.9	in	

OPERATIONAL DATA, VOLVO L90D

	GENERAL PURPOSE						GRADING	LIGHT MATERIAL			
											
Tires 20.5 R25*	Bolt-on edge	Bolt-on edge	Bolt-on edge	Teeth & segments	Bolt-on edge	Bolt-on edge	Bolt-on edge	Bolt-on edge	Bolt-on edge	Bolt-on edge	
Volume, heaped ISO/SAE	m ³ yd³	2,7 3.5	2,6 3.4	2,6 3.4	2,6 3.4	2,5 3.3	2,3 3.0	2,1 2.7	4,1 5.4	4,1 5.4	7,0 9.2
Actual volume, 110%	m ³ yd³	3,0 3.9	2,9 3.8	2,9 3.8	2,9 3.7	2,8 3.6	2,5 3.3	2,2 2.9	4,5 5.9	4,5 5.9	7,7 10.0
Static tipping load, straight	kg lb	10 770 23,744	10 870 23,964	10 170 22,421	10 850 23,920	10 130 22,333	10 320 22,752	9 060 19,974	10 350 22,818	9 740 21,473	9 440 20,812
at 35° turn	kg lb	9 580 21,120	9 680 21,341	9 010 19,864	9 660 21,297	8 990 19,820	9 160 20,194	8 050 17,747	9 180 20,238	8 610 18,982	8 280 18,254
at full turn	kg lb	9 230 20,349	9 330 20,569	8 670 19,114	9 310 20,525	8 650 19,070	8 810 19,423	7 750 17,086	8 840 19,489	8 270 18,232	7 940 17,505
Breakout force	kN lbf	108,8 24,459	111,0 24,954	101,8 22,886	110,9 24,931	103,8 23,335	108,1 24,302	79,6 17,895	86,4 19,423	80,6 18,120	69,7 15,669
A	mm ft in	7 660 25' 1"	7 630 25' 0"	7 740 25' 5"	7 780 25' 6"	7 710 25' 4"	7 650 25' 1"	7 970 26' 2"	7 980 26' 2"	8 090 26' 7"	8 400 27' 7"
E	mm ft in	1 190 3' 11"	1 170 3' 10"	1 270 4' 2"	1 300 4' 3"	1 240 4' 1"	1 190 3' 11"	1 570 5' 2"	1 490 4' 11"	1 590 5' 3"	1 860 6' 1"
H*)	mm ft in	2 830 9' 3"	2 850 9' 4"	2 770 9' 1"	2 760 9' 1"	2 790 9' 2"	2 830 9' 3"	2 520 8' 3"	2 620 8' 7"	2 540 8' 4"	2 340 7' 8"
L	mm ft in	5 440 17' 10"	5 410 17' 9"	5 460 17' 11"	5 410 17' 9"	5 440 17' 10"	5 380 17' 8"	4 820 15' 10"	5 500 18' 1"	5 560 18' 3"	5 760 18' 11"
M*)	mm ft in	1 110 3' 8"	1 090 3' 7"	1 170 3' 10"	1 220 4' 0"	1 150 3' 9"	1 110 3' 8"	1 250 4' 1"	1 390 4' 7"	1 460 4' 9"	1 670 5' 6"
N*)	mm ft in	1 680 5' 6"	1 670 5' 6"	1 710 5' 7"	1 730 5' 8"	1 700 5' 7"	1 690 5' 7"	1 650 5' 5"	1 730 5' 8"	1 730 5' 8"	1 720 5' 8"
V	mm ft in	2 650 8' 8"	2 650 8' 8"	2 650 8' 8"	2 750 9' 0"	2 750 9' 0"	3 000 9' 10"				
a ₁ clearance circle	mm ft in	11 860 38' 11"	11 850 38' 11"	11 900 39' 1"	11 930 39' 2"	11 890 39' 0"	11 850 38' 11"	12 320 40' 5"	12 130 39' 10"	12 200 40' 0"	12 600 41' 4"
Operating weight	kg lb	15 170 33,444	15 140 33,378	15 430 34,017	15 160 33,422	15 400 33,951	15 350 33,841	15 120 33,334	15 340 33,819	15 620 34,436	16 060 35,406

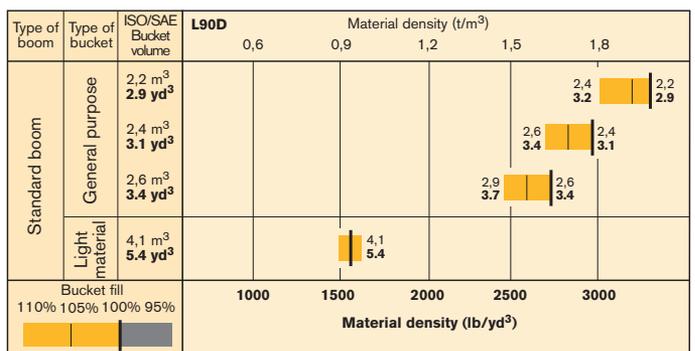
*) at dump angle 45°.

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 positions. • Good bucket fill performance. **Example: Sand and gravel. Fill factor ~ 105%. Density 2865 lb/yd³. Result: The 2.9 yd³ bucket carries 3.0 yd³.** For optimum stability, always consult the bucket selection chart.

Material	Bucket fill %	Material density lb/yd ³	ISO/SAE bucket volume,		Actual volume,		
			m ³	yd ³	m ³	yd ³	
Earth/Clay	~ 110	1,80	3030	2,2	2,9	2,5	3,2
			2865	2,5	3,3	2,8	3,6
			2530	2,6	3,4	2,8	3,7
Sand/Gravel	~ 105	1,90	3200	2,2	2,9	2,3	3,0
			2865	2,5	3,3	2,6	3,4
			2700	2,6	3,4	2,8	3,6
Aggregate	~ 100	1,90	3200	2,2	2,9	2,2	2,9
			3030	2,5	3,3	2,5	3,3
			2700	2,6	3,4	2,6	3,4
Rock	≤ 100	1,70	2865	2,2	2,9	2,2	2,9

The actual volume handled varies with the bucket fill factor and is often greater than indicated by the bucket's ISO/SAE volume. The table shows optimum bucket choice with regard to the material density and fill factor.

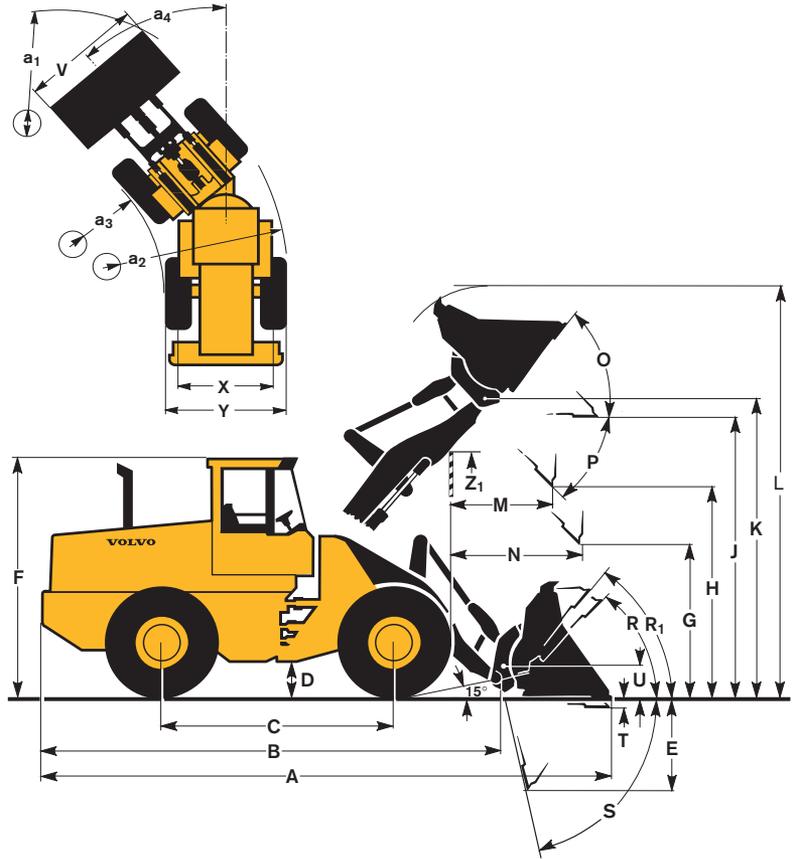


OPERATIONAL DATA & DIMENSIONS

TIRES: 20.5 R25* L2		
B	6 240 mm	20'6"
C	3 000 mm	9'10"
D	360 mm	1'2"
F	3 240 mm	10'8"
G	2 135 mm	7'0"
J	3 680 mm	12'1"
K	3 970 mm	13'0"
O	57°	
P	45° max	
R	44°	
R ₁ *	48°	
S	67°	
T	110 mm	4.3"
U	450 mm	1'6"
X	1 960 mm	6'5"
Y	2 490 mm	8'2"
Z	3 250 mm	10'8"
a ₂	5 370 mm	17'7"
a ₃	2 880 mm	9'5"
a ₄	±40°	

* Carry position SAE

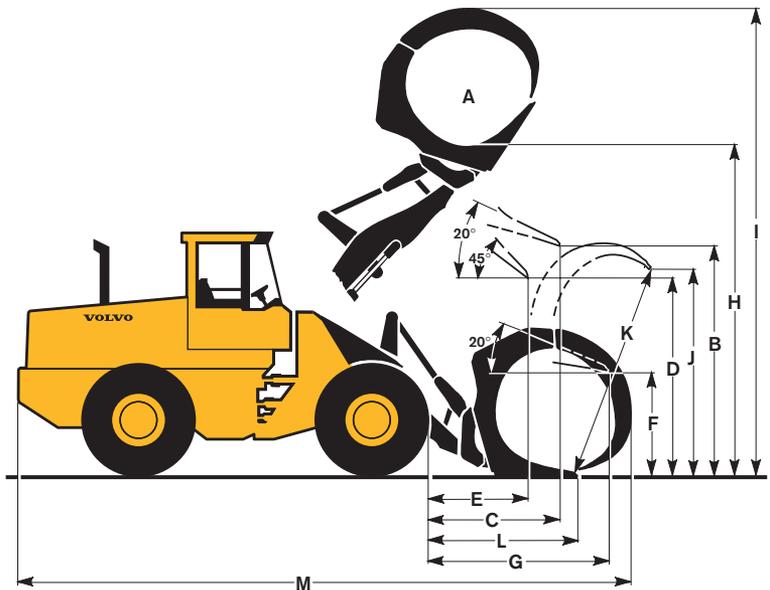
Where applicable, specifications and dimensions are in accordance with ISO 7131, SAE J732, ISO 7546, SAE J742, ISO 5998, SAE J818, ISO 8313.



SORTING-GRAPPLE (hook on)

A	1,8 m ²	19.4 ft²
B	3 460 mm	11'4"
C	1 650 mm	5'5"
D	2 900 mm	9'6"
E	1 300 mm	4'3"
F	1 470 mm	4'10"
G	2 610 mm	8'7"
H	4 520 mm	14'10"
I	6 310 mm	20'8"
J	2 400 mm	7'10"
K	2 590 mm	8'6"
L	2 000 mm	6'7"
M	8 270 mm	27'2"

Tires: 20.5 R25* L2
 Operating weight: 16 030 kg **35,340 lb** (incl. logging counterweight)
 Operating load: 4 800 kg **10,580 lb** (incl. logging counterweight)



STANDARD EQUIPMENT

Engine

High-performance, low-emission
Volvo TD63KBE
Dual fuel filters
Cold starting aid
Primary fuel filter with water separator
Air cleaner, dry type, dual element,
exhaust-aspirated pre-cleaner
Coolant level, sight gauge
Coolant filter
Engine intake manifold preheater
Muffler, spark-arresting
Fan guard

Electrical system

24 V – prewired for optional
accessories
Alternator, 24 V, 60 A
Battery disconnect switch
Gauges:
• Fuel level
• Transmission temp
• Engine temp
• Hour meter
Horn, electric
Reverse alarm (SAE J994)
Instrument panel with symbols
Lights:
• Driving (2 front), halogen
with high/low beam
• Parking lights
• Stop/tail combination
(2 rear)
• Turn signals with hazard
warning switch
• Working lights, halogen
(2 front, 2 rear)
• Instrument lighting

Contronic II

monitoring system, ECU with log and analysis system

Contronic II display
Engine shutdown to idle
• High engine coolant temperature
• Low engine oil pressure
• High transmission oil temperature
Neutral start interlock
Brake test
Test function for warning and
indicator lights
Warning and indicator lights:
• Alternator malfunction
• Oil pressure, engine
• Oil pressure, transmission
• Brake pressure
• Parking brake
• Hydraulic oil level
• Hydraulic oil temperature
• Axle oil temperature
• Primary steering
• High beams
• Turn signals
• Rotating beacon
• Preheating coil
• Differential lock (front axle)
• Coolant temperature
• Transmission oil temperature
• Brake charging
• Air cleaner restriction
(buzzer)
• Overspeeding engine
• Transmission oil filter
• Overspeeding engine/transmission
(buzzer)

Drivetrain

Transmission: modulated with single
lever control, Automatic Power
Shift (APS II) with mode selector
and operator-controlled declutch
Forward and reverse switch on
hydraulic control console
Differentials:
• front 100 %, hydraulic
differential lock
• rear, conventional
Tires 20.5R25* L3

Brake system

Wet, internal oil circulation-cooled,
outboard-mounted disc brakes,
4-wheel, dual circuit
Brake system, secondary
accumulator supplied

Cab

ROPS (SAE J10400C) (ISO 3471),
FOPS (SAE J 231) (ISO 3449).
Steering wheel, adjustable tilt,
telescopic
Acoustical lining
Ashtray
Cigarette lighter
Door lockable (left side access)
Dual service brake pedals
Heater/defroster/pressurizer with
four-speed blower fan
Filtered air
Floor mat
Dome light
Interior rearview mirrors (2)
Exterior rearview mirrors (2)
Openable window, right-hand side
Retractable seat belt (SAE J386)
Safety glass, tinted

Seat, heated, ergonomically
designed, adjustable suspension
Sliding ventilation window in door
Storage compartment
Sun visor
Windshield wiper, front & rear
Intermittent wiper, front
Windshield washer, front & rear

Hydraulic system

Main valve, 3-spool, pilot-operated
Pilot valve, 3-spool
Vane pump
Bucket lever detent
Bucket leveler, automatic with
position indicator, adjustable
Boom lever detents
Boom kickout, automatic, adjustable
Hydraulic pressure test ports,
quick connect
Hydraulic fluid level, sight gauge
Hydraulic oil cooler
Boom lowering, stopped engine
Hydraulic pressure test ports, quick
connect

External equipment

Isolation mounts: cab, engine,
transmission, radiator
Lifting and tie-down lugs
Side panels, engine hood
Steering frame lock
Vandalism lock, provision for:
batteries, engine compartment
Fuel fill strainer
Drawbar hitch
Cab access steps and handrails
Fenders, front & rear with anti-skid-
tape

OPTIONAL EQUIPMENT

Service and maintenance equipment

Tool box
Automatic lube system

Engine

Coolant pre-heater (120 V/1500 W)
Pre-cleaner, oil bath type
Pre-cleaner, turbo type
Radiator, corrosion protected

Electrical system

Attachment lights
Working lights front, extra
Working lights rear, extra
Rotating beacon, amber with
collapsible mount
Alternator, brushless
Alternator, 100A

Drivetrain

Limited-slip differential, rear
Limited-slip differential, front

Cab

Electrically controlled parking brake
Installation kit for radio
Hand throttle
Speedometer
Air-suspended operator's seat
Operator seat without heat
Seat belt, 3 in
Sliding window, right side
Air conditioner 8 kW, 27,300 Btu/h
Armrest, left side
Parking brake alarm
Sun blinds

Hydraulic system

Artic kit
Hydraulic control, 3rd function
Hydraulic control, 4th function
Hydraulic single-acting lifting
function
Biodegradable hydraulic fluid
Boom suspension system
Attachment bracket with separate
locking system
Lever detent 3rd function

External equipment

Fenders, full coverage,
axle-mounted rear
Logging counterweight.
500 kg 1100 lb

Other equipment

Comfort Drive Control (CDC)
Slow-moving vehicle emblem
Secondary steering
Electro-hydraulically operated
parking brake

Tires

20.5–25 L2, L3, L4
20.5 R25*
665/65 R25

Protective equipment

Guards for:
• Headlights
• Radiator grill
• Rear working lights
• Rear lights
• Side and rear window
• Windshield

Bellyguard front/rear
Cover plate under cab
Heavy-duty main valve guard

Attachments

Buckets
Fork equipment
Material handling arm
Log grapples
Diagonal snow blade
Broom
Cutting edge, 3 pc reversible,
bolt-on
Bucket teeth, bolt-on
Attachment rib kits

*Under our policy of continuous product 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
North America Inc.**

One Volvo Drive, Asheville, N.C. 28803-3447
Telephone: 828-650-2000

Ref. No. 22 1 669 2320 US
Printed in USA 03/00 – 10,0 WLO
Biltmore Press, Asheville, NC