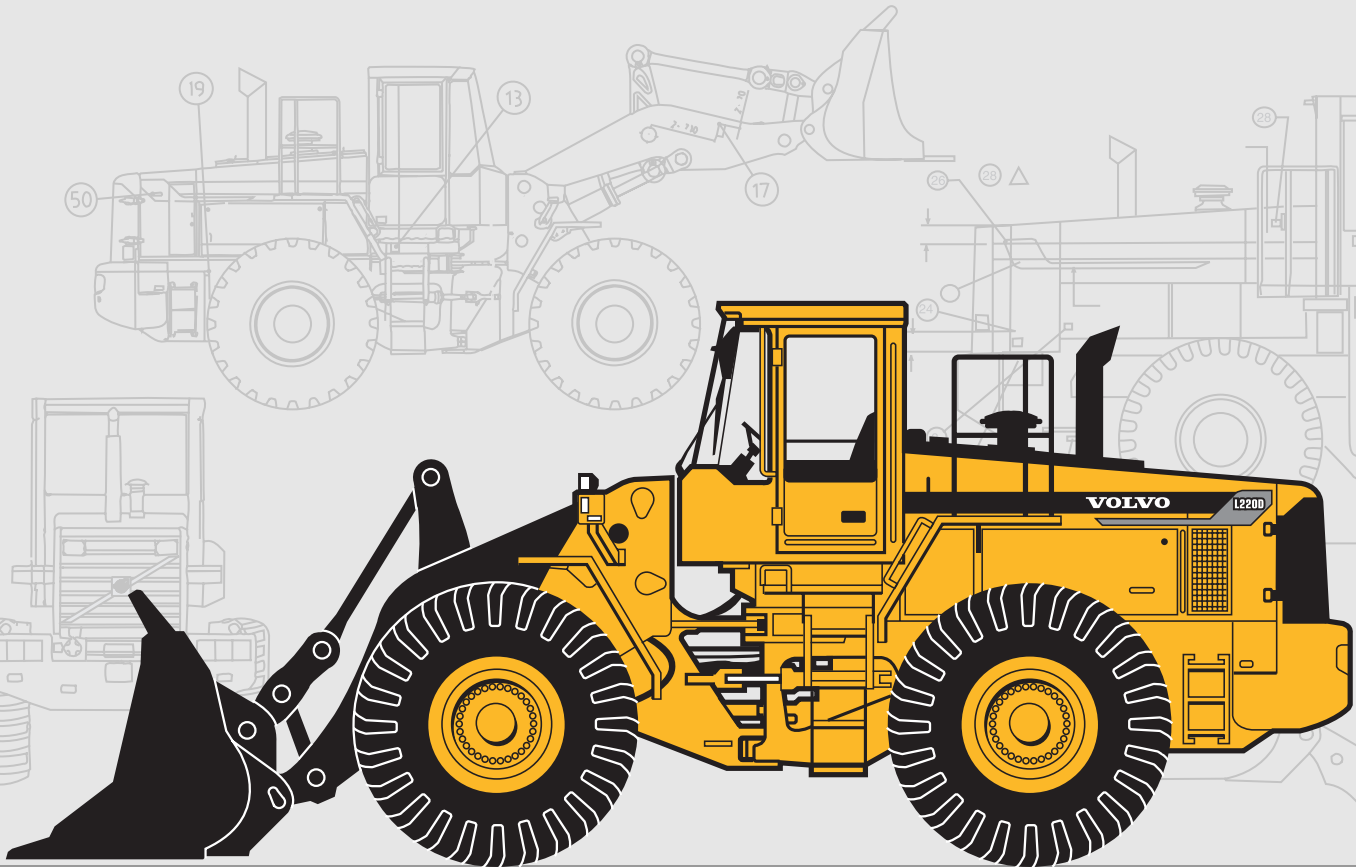


VOLVO WHEEL LOADER

L220D



- **Engine output ISO 9249:**
net 257 kW (349 hp)
SAE J1349:
gross 259 kW (352 hp)
net 257 kW (349 hp)
 - **Operating weight:** 30.2–32.4 t
66,600–71,400 lb
 - **Bucket volume:** 4.5–14.0 m³
5.9–18.3 yd³
 - **Volvo high performance, low-emission engine**
 - excellent low rpm performance
 - meets all known exhaust emission regulations for off-road vehicles until year 2001
 - **Care Cab II**
 - 2nd generation Care Cab, pressurized cab with excellent comfort, safety and visibility
 - **Volvo transmission with APS II**
 - 2nd generation Automatic Power Shift with mode selector and Pulse Width Modulated 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 with engine shutdown to idle and brake test
 - **Load-sensing** working hydraulics and steering system
 - **Boom Suspension System**
 - **Pilot-operated** working hydraulics with fingertip controls
- Optional Equipment**
- 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 and allows downloading of operating information from computer.

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

Refill capacities	l	US gal.
Fuel tank	331	87.4
Engine coolant	83	21.9
Hydraulic oil tank	165	43.6
Transmission oil	48	12.7
Engine oil	52	13.7
Axles front/rear	77/71	20.3/18.8



ENGINE

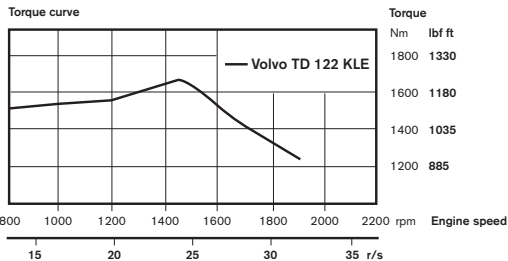
The Volvo engine offers high torque and quick response at low rpm. The machine operates efficiently at low engine speeds which contributes to good fuel economy, less noise, reduced wear and longer life.

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

Air cleaning: three-stage – dry type

Cooling system: Hydraulically driven radiator cooling fan.

Engine Volvo TD 122 KLE		
Power output at	26,7 r/s	1600 rpm
ISO 9249 net	257 kW	349 hp
SAE J1349 gross	259 kW	352 hp
SAE J1349 net	257 kW	349 hp
Maximum torque at	24,2 r/s	1450 rpm
ISO 9249 net	1645 Nm	1213 lbf ft
SAE J1349 gross	1660 Nm	1224 lbf ft
SAE J1349 net	1645 Nm	1213 lbf ft
Displacement	12 l	732 in ³



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	2x170 Ah
Cold cranking capacity, approx.	1150 A
Reserve capacity, approx.	350 min
Alternator rating	1680 W/80A
Starter motor output	6,6 kW 9,0 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 with Pulse Width Modulated (PWM) valves.

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

Axles: Volvo axles with fully floating shafts and 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 4.5 mph
2	11,7 km/h 7.3 mph
3	23,4 km/h 14.5 mph
4	34,2 km/h 21.3 mph
Measured with tires	29.5 R25 L3
Axles:	
Front	Volvo AWB 50
Rear	Volvo AWB 41
Rear axle oscillation	±15 °
Ground clearance at 15° oscillation	620 mm 24.4 in



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. Operator selectable transmission declutch function.

Parking brake: Fully sealed, wet multi-disc brake built into the transmission. Spring applied and electro-hydraulically released via a switch on the instrument panel.

Secondary brake: Dual brake circuits with rechargeable accumulators. One circuit or the parking brake fulfills 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 2x61 in ³ and 1x30.5 in ³
Accumulator for parking brake	1x0,5 l 1x30.5 in ³



STEERING SYSTEM

Low effort 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, hydraulically 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	3.94 in
Piston rod diameter	50 mm	1.97 in
Stroke	458 mm	18.03 in
Relief pressure	21 MPa	3046 psi
Maximum flow	170 l/min	44.9 US gpm
Maximum articulation	± 37°	



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 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/SAE J2105 ...	76 dB (A)	
External sound level		
According to ISO 6395/SAE J2104 ...	LwA 111 dB (A)	
Ventilation	9 m ³ /min	318 ft³/min
Heating capacity	11 kW	37,500 Btu/h
Air conditioning (optional equipment)	8 kW	27,300 Btu/h



HYDRAULIC SYSTEM

The Load-Sensing hydraulic system delivers 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 bucket positioner can be switched on and off.

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	3626 psi
Flow	225 l/min	59.4 US gpm
at	10 MPa	1450 psi
and engine speed	31,7 r/s	1900 r/min
Relief pressure, pump 2	26 MPa	3771 psi
Flow	170 l/min	44.9 US gpm
at	10 MPa	1450 psi
and engine speed	31,7 r/s	1900 r/min
Pilot system		
Relief pressure	3,5 MPa	508 psi
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 parallel lift-arm action. These features, together with high lifting height and long reach, give the lift-arm system excellent performance in bucket loading and log handling.

Lift cylinders	2	
Cylinder bore	190 mm	7.5 in
Piston rod diameter	90 mm	3.5 in
Stroke	768 mm	30.2 in
Tilt cylinder	1	
Cylinder bore	260 mm	10.2 in
Piston rod diameter	120 mm	4.7 in
Stroke	455 mm	17.9 in






OPERATIONAL DATA VOLVO L220D

	GENERAL PURPOSE ■					ROCK*			LIGHT MTL■	LONG BOOM
										
Tires 29.5 R25 L4 Pin-on buckets	Bolt-on edges	Bolt-on edges	Bolt-on edges	Bolt-on edges	Teeth & Segments	Teeth & Segments	Teeth & Segments	Bolt-on edges		
Volume, heaped ISO/SAE	m ³ 5,6****	m ³ 5,4****	m ³ 5,2****	m ³ 4,9****	m ³ 4,6	m ³ 4,5	m ³ 4,5	m ³ 9,5	---	
Volume at 110% fill factor	yd ³ 7.3****	yd ³ 7.0****	yd ³ 6.8****	yd ³ 6.4****	yd ³ 6.0	yd ³ 5.9	yd ³ 5.9	yd ³ 12.4	---	
Static tipping load, straight	kg 22340	kg 22500	kg 22440	kg 22590	kg 22510	kg 22540	kg 23040	kg 21840	-2590	
at 35° turn	lb 49250	lb 49600	lb 49470	lb 49800	lb 49630	lb 49690	lb 50790	lb 48150	-5710	
at full turn	kg 19610	kg 19780	kg 19720	kg 19880	kg 19790	kg 19790	kg 20280	kg 19170	-2330	
Breakout force	lb 43230	lb 43610	lb 43480	lb 43830	lb 43630	lb 43630	lb 44710	lb 42260	-5140	
	kg 19290	kg 19460	kg 19410	kg 19560	kg 19480	kg 19470	kg 19960	kg 18860	-2310	
	lb 42530	lb 42900	lb 42790	lb 43120	lb 42950	lb 42920	lb 44000	lb 41580	-5090	
Breakout force	kN 220,1	kN 224,7	kN 224,7	kN 231,2	kN 238,5	kN 192,2	kN 240,2	kN 168,2	---	
	lbf 49480	lbf 50510	lbf 50510	lbf 51980	lbf 53620	lbf 43210	lbf 54000	lbf 37810	---	
A	mm 8760	mm 8720	mm 8720	mm 8680	mm 8870	mm 9210	mm 8840	mm 9240	+311	
	ft in 28'9"	ft in 28'7"	ft in 28'7"	ft in 28'6"	ft in 29'1"	ft in 30'3"	ft in 29'0"	ft in 30'4"	+1'0"	
E	mm 1360	mm 1330	mm 1330	mm 1290	mm 1250	mm 1540	mm 1220	mm 1780	-21	
	ft in 4'6"	ft in 4'4"	ft in 4'4"	ft in 4'3"	ft in 4'1"	ft in 5'0"	ft in 4'0"	ft in 5'10"	-0'1"	
H****)	mm 3260	mm 3280	mm 3280	mm 3310	mm 3190	mm 3050	mm 3210	mm 2890	+366	
	ft in 10'8"	ft in 10'9"	ft in 10'9"	ft in 10'10"	ft in 10'6"	ft in 10'0"	ft in 10'6"	ft in 9'6"	+1'2"	
L	mm 6540	mm 6500	mm 6450	mm 6390	mm 6340	mm 6340	mm 6400	mm 6570	+366	
	ft in 21'5"	ft in 21'4"	ft in 21'2"	ft in 21'0"	ft in 20'10"	ft in 20'10"	ft in 21'0"	ft in 21'7"	+1'2"	
M****)	mm 1310	mm 1290	mm 1290	mm 1260	mm 1400	mm 1750	mm 1390	mm 1610	-31	
	ft in 4'4"	ft in 4'3"	ft in 4'3"	ft in 4'2"	ft in 4'7"	ft in 5'9"	ft in 4'7"	ft in 5'3"	-0'1"	
N	mm 2050	mm 2040	mm 2040	mm 2020	mm 2110	mm 2270	mm 2110	mm 2180	+266	
	ft in 6'9"	ft in 6'8"	ft in 6'8"	ft in 6'8"	ft in 6'11"	ft in 7'5"	ft in 6'11"	ft in 7'2"	+0'10"	
V	mm 3400	mm 3400	mm 3400	mm 3400	mm 3430	mm 3430	mm 3430	mm 3700	---	
	ft in 11'2"	ft in 11'2"	ft in 11'2"	ft in 11'2"	ft in 11'3"	ft in 11'3"	ft in 11'3"	ft in 12'2"	---	
a ₁ clearance circle	mm 15280	mm 15260	mm 15260	mm 15230	mm 15420	mm 15640	mm 15410	mm 15840	---	
	ft in 50'2"	ft in 50'1"	ft in 50'1"	ft in 50'0"	ft in 50'7"	ft in 51'4"	ft in 50'7"	ft in 52'0"	---	
Operating weight	kg 30810	kg 30670	kg 30590	kg 30530	kg 30590	kg 32130	kg 31920	kg 30610	+272	
	lb 67920	lb 67620	lb 67440	lb 67310	lb 67440	lb 70830	lb 70370	lb 67480	+600	

*) with L5 tires **) with 100% bucket fill factor ***) Measured to the tip of the bucket teeth or bolt-on edge. Dump height to bucket edge ****) available also with teeth and segments (acc. SAE) + approx. 200mm. Measured at 45° dump angle. (Spade nose buckets at 42°.) ■ available also in hook-on version

BUCKET SELECTION CHART

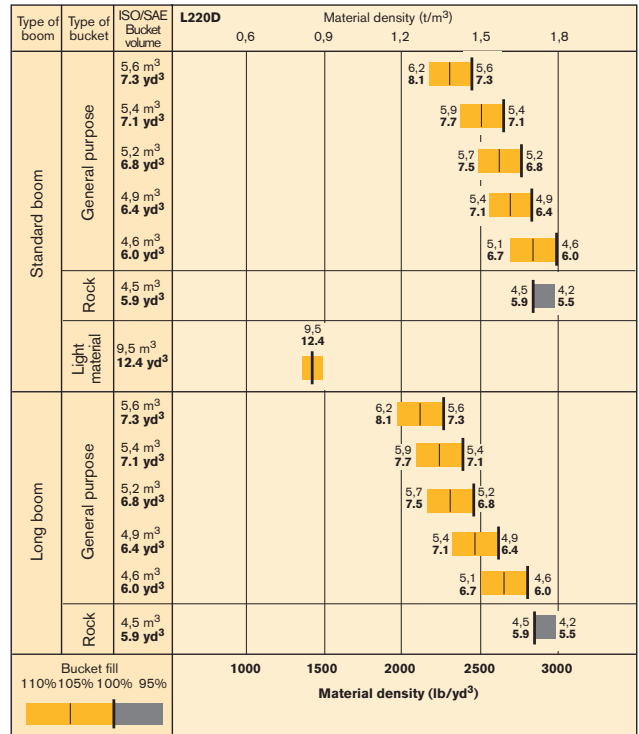
The choice of bucket is determined by the density of the material and the expected bucket fill factor. The actual bucket volume is often larger than the rated capacity, due to the TP Linkage features: • Open bucket design. • Very good roll back in all positions. • Good bucket fill performance. The below 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		ISO/SAE bucket volume		Actual volume	
			t/m ³	lb/yd ³	m ³	yd ³	m ³	yd ³
Earth/Clay ~ 110	~ 110		~ 1,45	~ 2440	5,4	7,1	~ 5,9	~ 7,7
			~ 1,50	~ 2530	5,2	6,8	~ 5,7	~ 7,5
			~ 1,55	~ 2615	4,9	6,4	~ 5,4	~ 7,1
			~ 1,60	~ 2700	4,6	6,0	~ 5,1	~ 6,7
Sand/Gravel ~ 105	~ 105		~ 1,55	~ 2615	5,4	7,1	~ 5,7	~ 7,5
			~ 1,60	~ 2700	5,2	6,8	~ 5,5	~ 7,2
			~ 1,65	~ 2780	4,9	6,4	~ 5,1	~ 6,7
			~ 1,70	~ 2865	4,6	6,0	~ 4,8	~ 6,3
Aggregate ~ 100	~ 100		~ 1,60	~ 2700	5,4	7,1	~ 5,4	~ 7,1
			~ 1,65	~ 2780	5,2	6,8	~ 5,2	~ 6,8
			~ 1,70	~ 2865	4,9	6,4	~ 4,9	~ 6,4
			~ 1,80	~ 3035	4,6	6,0	~ 4,6	~ 6,0
Rock	≤ 100		~ 1,70	~ 2865	4,5	5,9	~ 4,5	~ 5,9

Rock buckets are sized for optimal penetration and filling capability rather than the density of the material.

SUPPLEMENTAL OPERATING DATA

Tires 29.5 R25 L4	Standard boom				Long boom				
	29.5 R25 L3		29.5 R25 L5		29.5 R25 L3		29.5 R25 L5		
Width over tires	mm in	-19	-0.7	+69	+2.7	-19	-0.7	+69	+2.7
Ground clearance	mm in	-25	-1	+15	+0.6	-25	-1	+15	+0.6
Tipping load, full turn	kg lb	-317	-700	+673	+1480	-350	-770	+568	+1250
Operating weight	kg lb	-432	-950	+1132	+2500	-432	-950	+1132	+2500



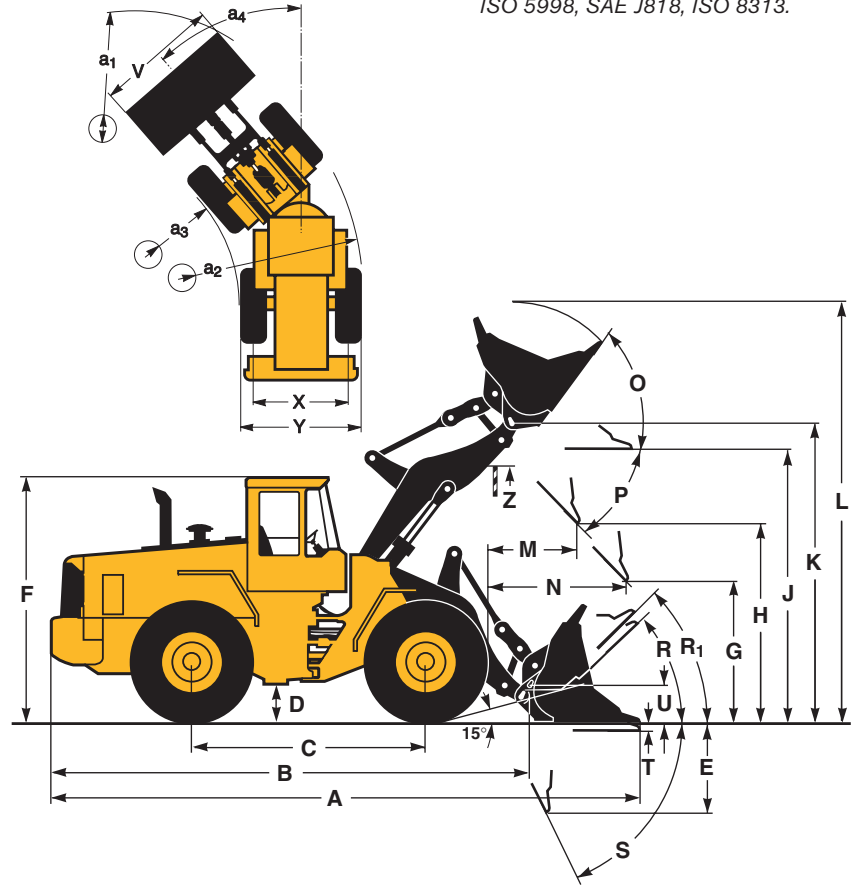
OPERATIONAL DATA AND DIMENSIONS

Tires: 29.5 R25 L4

	Standard boom		Long boom	
B	7090 mm	23'3"	7410mm	24'4"
C	3550 mm	11'8"		
D	550 mm	1'10"		
F	3630 mm	11'11"		
G	2135 mm	7'0"		
J	4260 mm	14'0"	4620mm	15'2"
K	4670 mm	15'4"	5040mm	16'6"
O	56 °			
P _{max}	48 °		47 °	
R	43 °		44 °	
R ₁ *	46 °			
S	65 °		63 °	
T	90 mm	3.5"		
U	550 mm	1'10"		
X	2400 mm	7'10"		
Y	3170 mm	10'5"		
Z	4060 mm	13'4"	4400mm	14'5"
a ₂	6890 mm	22'7"		
a ₃	3720 mm	12'2"		
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.

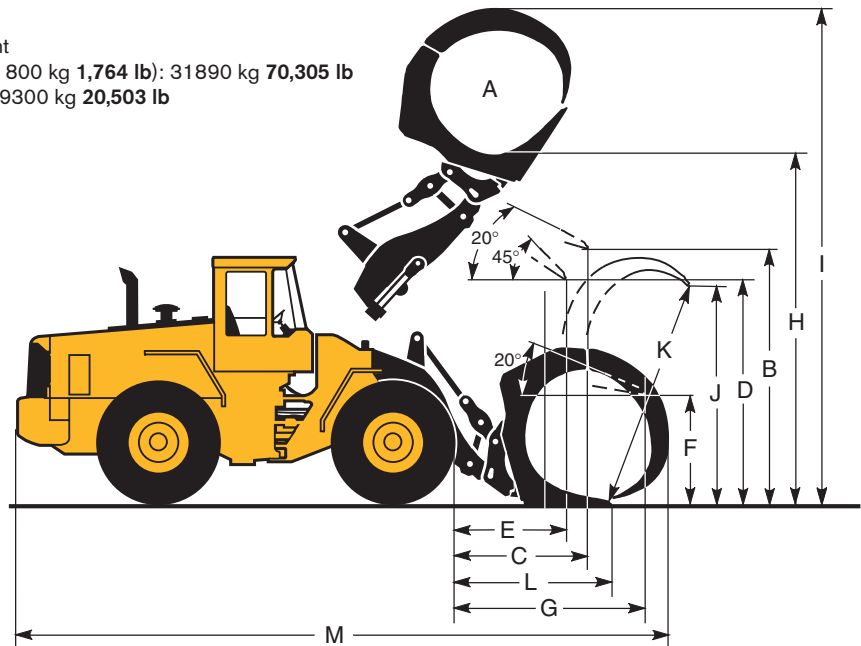


LOG GRAPPLE (hook on)

Tires: 29.5 R25 L4

A	3,7	m ²	39.8 ft ²
B	3950 mm		13'0"
C	2265 mm		7'5"
D	3190 mm		10'6"
E	1775 mm		5'10"
F	1670 mm		5'6"
G	3220 mm		10'7"
H	5365 mm		17'7"
I	7860 mm		25'9"
J	3360 mm		11'0"
K	3650 mm		12'0"
L	2595 mm		8'6"
M	10440 mm		34'3"

Operating weight
(incl. logging cw 800 kg 1,764 lb): 31890 kg 70,305 lb
Operating load: 9300 kg 20,503 lb



STANDARD EQUIPMENT

Engine

High performance low emission
Coolant filter
Three stage air cleaner with ejector
and safety filter
Sight gauge for coolant level
Intake manifold preheater
Water separator with filter
Hydraulically driven fan
Dual fuel filters
Double insulated, spark arresting
muffler

Electrical system

Alternator, 24 V/80 A
Battery disconnect switch
Gauges:
• Fuel gauge
• Engine coolant temperature
• Transmission temperature
• Hour meter
Electric horn
Instrument panel with symbols
Reverse alarm
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
• 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

Drivetrain

Automatic Power Shift II with
operator-controlled declutch
function
PWM-control valve
Right hand F/R switch on hydraulic
console
Differentials:
front: 100% hydraulic diff lock
rear: conventional
Tires: 29.5 R25 GP4B Good Year

Brake system

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

Cab

ROPS (SAE J1040, ISO 3471),
FOPS (SAE J231, ISO 3449)
Air conditioning
Acoustic inner lining
Ashtray
Cigarette lighter
Lockable door (left side)
Heater/defroster pressurized with 4
speed blower fan and cab air filter
Dual brake pedals
Floor mat
Interior lights
Interior rear-view mirror
2 exterior rear-view mirrors
Openable window right-hand side
Tinted safety glass
Retractable seatbelt (SAE J386)
Tilt/Telescoping wheel
Adjustable lever console
Ergonomically designed operator's
seat with air suspension
Storage compartment
Sliding window in door
Sun visor
Beverage holder
Windshield washers front and rear
Windshield wipers front and rear
Intermittent function front
windshield wipers
Service platforms with anti-slip
surfaces on front and rear fenders

Speedometer
Access steps and handrails

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 Suspension System
Boom lowering system
Boom lever detent
Boom kickout, automatic, adjustable
Bucket leveler, automatic with
position indicator, adjustable
Bucket lever detent
Test ports with quick-couplings
Hydraulic oil cooler
Hydraulic control lever lockout

External equipment

Noise and vibration dampening cab,
engine and transmission mounts
Lifting lugs
Easy-to-open side panels and engine
hood
Steering frame lock
Vandalism lock provision for batteries
and engine oil
Towing hitch
Front and rear fenders
Fuel strainer

OPTIONAL EQUIPMENT

Service and maintenance

Tool box, lockable
Automatic lubrication system
Automatic lubrication of attachment
bracket

Engine equipment

Engine block heater
Oil bath pre-cleaner
Turbo II air cleaner

Electrical system

Attachment working lights
Extra working lights front
Extra working lights rear
Alternator, 60 A
Rotating beacon, collapsible

Cab

Installation kit for radio
Hand-operated throttle

Sliding window, right
Retractable seatbelt, longer and
wider than standard
Ventilation air filter for asbestos
environment
Operator's seat with high backrest
and electrical heating
Armrest (left) for ISRI operator seat

Hydraulic system

3rd hydraulic function
3rd/4th hydraulic function
Biodegradable hydraulic fluid
Attachment bracket
Attachment locking
Artic kit

External equipment

Long boom
Swing-out rear fender
Logging counterweight

Protective equipment

Guards for front headlights
Guards for rear worklights
Guards for side windows and rear
window
Windshield guard
Protective guards for tail lights
Bellyguard front and rear
Cover plate under cab
Radiator guard
Heavy duty valve cover plate, front
frame

Other equipment

Lever steering (CDC)
Secondary steering
External brake oil cooling

Tires

29.5 R25, 29.5-25
L3 through L5

Attachments

Buckets:
• Straight with/without teeth
• Spade nose with/without teeth
• High tip
• Light material
Three piece, reversible bolt-on
cutting edge
Bolt-on and weld-on bucket teeth
Segments, reversible
Log grapples
Fork equipment
Material handling arm

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

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North America Inc.

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