

VOLVO BM

L 160



VOLVO BM L 160 - A HIGH CAPACITY LOADER FOR HIGH PRODUCTION APPLICATIONS

Large volumes, heavy materials, high productivity - the Volvo BM L160 is dimensioned to give the best possible operating economy in the heavier handling jobs.

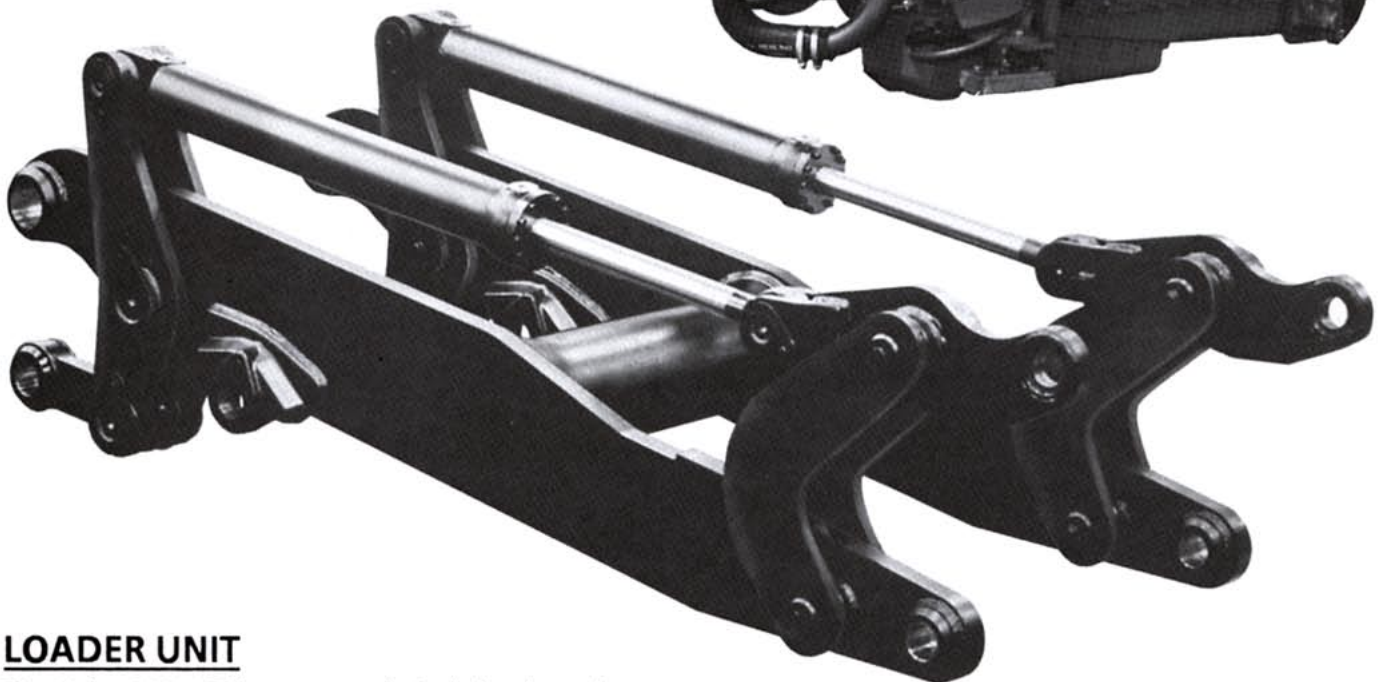
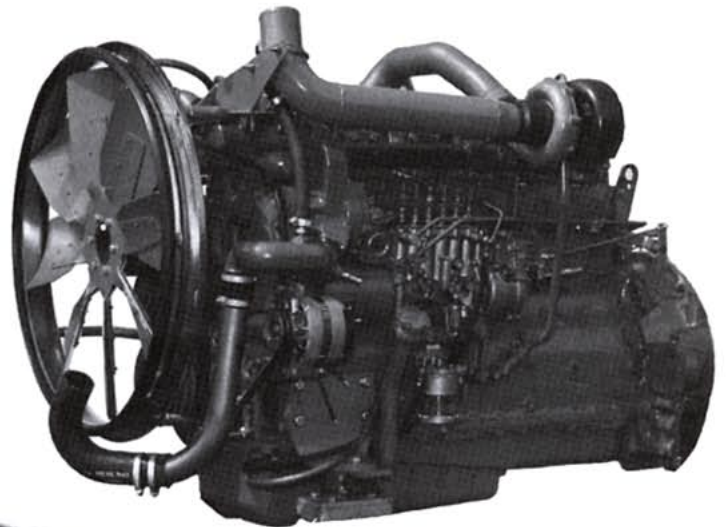
Working with this machine is to control a powertrain composed of carefully matched, smoothly interacting components. The Volvo diesel engine, transmission and loader unit hydraulic system are ideally matched with each other.

This gives high penetration capacity with large lifting and breakout force when the going gets really tough.

This high capacity machine is operated from a very comfortable cab. The operator has a good view over the working area and can perform highly skilled work with minimum control lever and steering effort.

POWER & ENGINEERING

Volvo BM components are manufactured to a very high technical specification. The highest standards of design engineering plus stringent production and quality control, are your guarantee of total satisfaction. In order to achieve good overall economy and maximum machine utilization, a good deal of effort has been devoted to component co-ordination and the extension of service intervals. All this gives you an efficient, economical machine, reliable in every detail.



LOADER UNIT

The Volvo BM L160 has a strongly built loader unit specially designed for heavy-duty production work. The long reach and good lifting height make it easy to maneuver the load over high hoppers and vehicles etc. It is important for a production loader to have good tiltforces in all positions, and the L160 has a linkage geometry which permits this throughout the whole lifting range. Another refinement is on bucket rollback. The bucket accelerates up against a mechanical stop so that the load in a well filled bucket is moved as far back as possible, thereby increasing machine stability.

CORRECT ATTACHMENTS

Volvo BM can offer a wide range of attachments. By using the right attachment for different materials and handling applications both productivity and profitability can be increased. The Michigan L160 has therefore been provided with a large selection of high quality attachments specially designed for their particular purposes, and the quick coupler attachment bracket (optional equipment) to facilitate changing from one to another.

CAB

The skilled and important work which has to be carried out by the operator of a heavy loader requires great concentration. On the Volvo BM L160 the operator has full control over the machine from the very safe ROPS and FOPS approved cab. It is also exceptionally comfortable and well insulated and is provided with an efficient heating and ventilation system to keep the operator fresh and alert during long working shifts. Ergonomic studies have been made to give guidelines for the convenient arrangement of controls and instruments, after which the final lay-out has been determined by practical tests performed by professional operators.

Automatic Power shift

Volvo BM is in the forefront of technical development with AUTOMATIC POWER SHIFT transmissions (optional equipment). A specially programmed computer automatically selects the most suitable gear for all situations. This means that the operator can work more effectively, getting more production out of the machine and with lower fuel consumption.



VERSATILITY

The L160's capacity for hard work combined with its excellent handling, good lifting height and long reach, permits the quick handling of large volumes of material.

The loader unit gives good tilting forces in all positions - even at the top. This is a very important feature when working at timber and pulpwood terminals etc.

The L160 also has a high carrying capacity over long distances. The long wheelbase and good weight distribution of the machine provide stability and high average speeds.





ENGINE

The Volvo TD 101 G is a 6-cylinder, direct-injection, 4-stroke, turbocharged diesel engine with wet, replaceable cylinder liners.

Air cleaning: air cleaning in three stages.

1. Cyclone cleaner with automatic exhaust ejector
2. Paper filter with indicator in cab.
3. Replaceable safety filter

Make		Volvo
Model		TD 101 G
Output, gross, at SAE J 1349	rps (rpm)	36,7 (2200)
	kW (hp)	194 (264)
Flywheel output at SAE J 1349	rps (rpm)	36,7 (2200)
	kW (hp)	185 (252)
DIN 70020/6271	kW (hp)	185 (252)
Max. torque at SAE J 1349 Gross	rps (rpm)	23,3 (1400)
	Nm (lbf ft)	980 (723)
SAE J 1349 Net	Nm (lbf ft)	962 (710)
DIN 70020/6271	Nm (lbf ft)	962 (710)
No. of cylinders		6
Displacement, total	dm ³ l (in ³)	9,6 (586)
Bore	mm (in)	120,65 (4,75)
Stroke	mm (in)	140 (5,50)
Compression ratio		15:1



ELECTRICAL SYSTEM

The electrical system is well protected with fuses. Pre-wired for extra equipment.

Central warning: (Standard on certain markets) Central warning lamp for following functions: engine oil pressure, brake pressure, parking brake, engine temperature, transmission temperature, transmission oil pressure.

Voltage	V	24
Batteries	Ah / No	140 / 2
Battery capacity ea.	A	800
Cranking capacity ea.	min	270
Reserve capacity ea.	W / A	1540 / 55
Alternator rating	kW (hp)	6,6 (9)
Starter motor output		



DRIVETRAIN

Torque converter: single-stage, single-phase.

Transmission: Volvo BM power shift transmission of countershaft type with directional clutch modulation. Four speeds forward and three reverse. Single lever control.

Axles: fully floating half-shafts with planetary type hub reduction gears. One-piece axle housing of ductile iron. Rigid front axle and oscillating rear axle.

Differential: 100% differential lock on front axle. Engagement and disengagement by means of switch on cab floor. Gearing is conventional, hypoid gears.

Hub reduction: Volvo BM manufacture with low-friction roller bearings on each wheel. The hub reduction gears can be removed without having to remove wheels and brakes.

Tires: Alternative tires are available for different working operations.

Torque multiplication		2,6 : 1
Transmission, make		Volvo BM
Model		HT 200
Running speeds		
1, forward/reverse	km/h (mile/h)	7,3 (4,5)
2, forward/reverse	km/h (mile/h)	13,5 (8,4)
3, forward/reverse	km/h (mile/h)	26,7 (16,6)
4, forward	km/h (mile/h)	39,9 (24,6)
Measurement with tires		26.5 - 25
Front axle, make		Volvo BM
Model		AH 70 A
Rear axle, make		Volvo BM
Model		AH 70 D
Oscillation movement, total	± °	15
	± mm (± in)	300 (12)
Standard tires		



BRAKE SYSTEM

The brake system meets requirements according to SAE J 1152, EG 71/320 and ISO 3450.

Service brakes: air-hydraulically operated disc power brakes. Transmission disengagement when braking pre-selected with a switch on the instrument panel.

Secondary system: dual-circuit system, divided between axles.

Parking brake: enclosed wet multi-disc brake built into transmission. A spring-loaded application. Hydraulic release with a control on left of operator. A warning lamp indicates when the parking brake is applied and gear lever is in forward or reverse.

Brake friction area		
front/wheel ea.	cm ² (in ²)	810 (126)
rear/wheel ea.	cm ² (in ²)	810 (126)
Reservoirs/accumulators	st	3
volume, total	dm ³ l (in ³)	50 (3050)
Parking brake area, total	cm ² (in ²)	1547 (240)



STEERING SYSTEM

Articulated steering. Orbital steering with boosted flow.

Pump: double vane fitted to a power take-off on transmission.

System supply: steering system supplied from front section of pump.

Cylinders: two double-acting cylinders with chromed piston rods.

Steering cylinders, number		2
Bore	mm (in)	110 (4,3)
Piston rod diameter	mm (in)	50 (2)
Stroke	mm (in)	423 (16,7)
Working pressure	MPa (psi)	15 (2175)
Flow volume	dm ³ , l /min (US gal /min)	190 (50)
at	MPa (psi)	10 (1450)
and engine speed	rps (rpm)	36,7 (2200)



CAB

Tested and approved as safety cab according to the Swedish Working Environment Act section 3, sub-section 8, and meets standards according to ISO 3471-1980, ROPS (SS783), ISO 3449-1980 FOPS (SS782) and SS/ISO 6055 "Overhead guards for fork lift trucks".

The cab is mounted on four rubber pads and is well insulated. The windshield is of laminated safety glass, all other windows being of tempered safety glass.

Heater and defroster: heating element with filtered fresh air and 3-speed fan with defroster outlets for all windows.

Operator's seat: spring suspended, fully adjustable operator's seat with seat belt and heater.

Emergency exits		3
Ventilation	m ³ /min (cfm)	10 (353)
Heating capacity	kW (BTU/h)	11,6 (39600)
Operator's seat		ISRI 6000 / 575



HYDRAULIC SYSTEM

Open center system pilot operated, and filtered breather on reservoir.

Pump: double vane pump fitted to a power take-off on transmission.

System supply: system supplied from rear section of pump.

Valve: double-acting 3 section valve. The control valve is governed by a 3-section servo valve.

Lifting function: the valve has four positions: lifting, neutral, lowering and floating. Disengageable electro-magnetic boom kick-out and ground positioner. Adjustable for all positions between maximum reach and full lifting height as well as ground position.

Tilting function: the valve has three positions: rollback, neutral and forward tilting. Disengageable electro-magnetic bucket positioner adjustable for all desired loading angles.

Cylinders: double-acting.

Filter: full-flow filtering through 10 micron filter cartridge in combination with magnetic core.

Load unit: hydraulic cylinders fitted in line with lifting arms.

Working pressure	MPa (psi)	17,0 (2465)
Flow volume	dm ³ , l /min (US gal /min)	380 (100,4)
at	MPa (psi)	10 (1450)
and engine speed	rps (rpm)	36,7 (2200)
Lifting cylinder, number		2
Bore	mm (in)	170 (6,7)
Piston rod diameter	mm (in)	80 (3,1)
Stroke	mm (in)	1107 (43,6)
Tilting cylinder, number		2
Bore	mm (in)	140 (5,5)
Piston rod diameter	mm (in)	70 (2,8)
Stroke	mm (in)	983 (38,7)
Lifting time (with load, SAE)	s	7,8
Tipping time (with load, SAE)	s	4
Lowering time (empty)	s	4
Total cycle time	s	15,8



SERVICE REFILL CAPACITIES

Crankcase	dm ³ l (US gal)	29 (7,7)
Fuel tank	dm ³ l (US gal)	340 (89,8)
Cooling system	dm ³ l (US gal)	70 (18,5)
Transmission, total	dm ³ l (US gal)	47 (12,4)
Front axle, total	dm ³ l (US gal)	45 (11,9)
Rear axle, total	dm ³ l (US gal)	56 (14,8)
Hydraulic system	dm ³ l (US gal)	320 (84,5)
Hydraulic tank	dm ³ l (US gal)	230 (60,8)

ATTACHMENTS *(for further information please contact your local dealer)*

Buckets

Straight lip without teeth	3,8/4,2/4,5 m ³ (5,0/5,5/6,0 yd ³)
Straight lip with teeth	3,8/4,2 m ³ (5,0/5,5 yd ³)
V-lip without teeth	3,8 m ³ (5,0 yd ³)
Truncated V-lip with teeth	3,8 m ³ (5,0 yd ³)
Light materials bucket	7,0/13,0 m ³ (9,2/17,0 yd ³)
Spill guard	

Timber grapples

Unloading Grapple	3,1/4,1 m ² (33/44 ft ²)
Sorting Grapple	3,1 m ² (33 ft ²)
Tree Length Grapple	1,4 m ² (15 ft ²)
Log Pusher	
Heel Kickout	
Fork equipment	
Fork Holder	2260 mm (7'5")
Fork Tines	1500 mm (4'11")

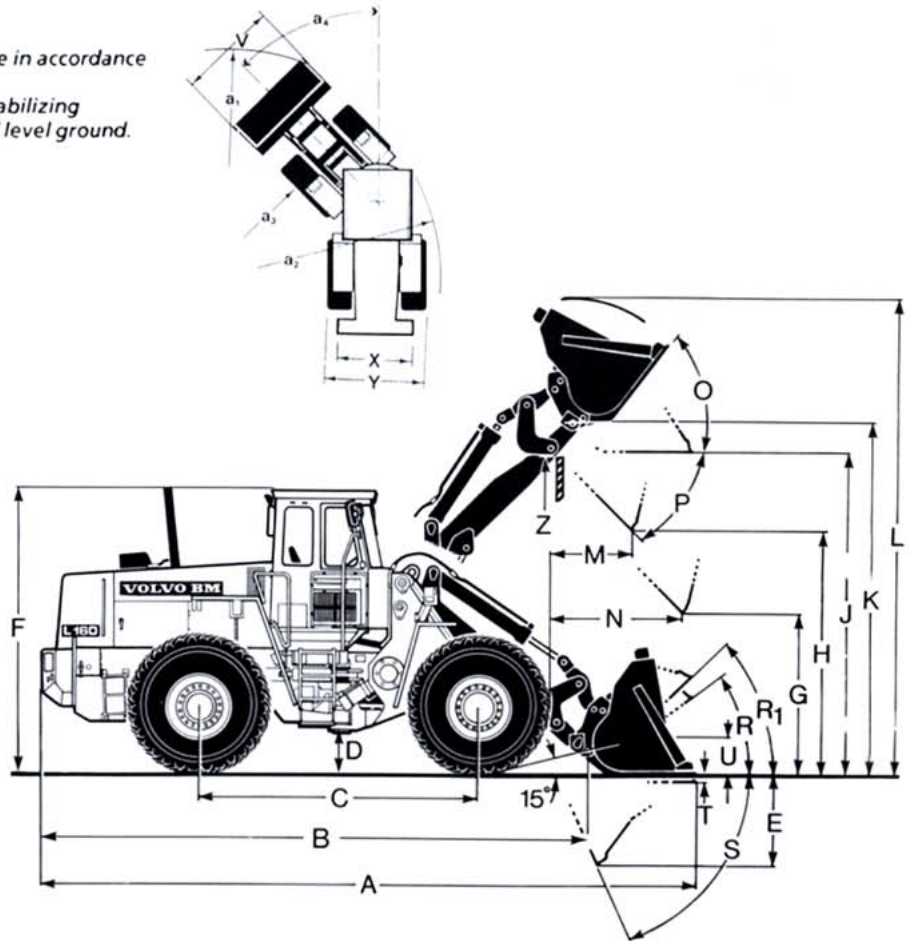
DIMENSIONAL DATA VOLVO BM L160

Tires: 26.5 R 25* XRA L3

Where applicable, specifications and dimensions are in accordance with SAE Standard J 732 c, J 742 b and J 818 b.
Liquid ballast in rear tires only recommended for stabilizing purposes in timber and pallet handling on hard and level ground.

B	mm (ft in)	6570 (21'7")
C	mm (ft in)	3550 (11'8")
D	mm (ft in)	470 (1'7")
F	mm (ft in)	3500 (11'6")
G	mm (ft in)	2000 (6'7")
J	mm (ft in)	4140 (13'7")
K	mm (ft in)	4425 (14'6")
O	°	55
P	°	45
R	°	42
R ₁ *	°	45
S	°	67
T	mm (ft in)	90 (3.5")
U	mm (ft in)	415 (1'4")
X	mm (ft in)	2310 (7'7")
Y	mm (ft in)	3000 (9'10")
Z	mm (ft in)	4020 (13'2")
a ₂	mm (ft in)	6805 (22'4")
a ₃	mm (ft in)	3805 (12'6")
a ₄	±°	37

* Carrying position SAE



Bucket type

- 1 = Straight without teeth
- R = Hook-On
- D = Pin-On

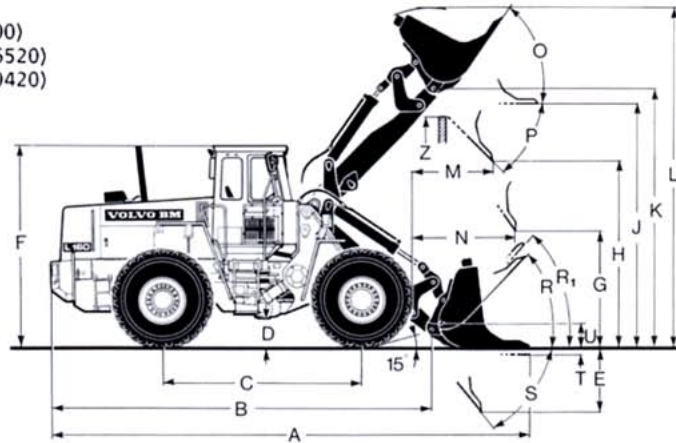
Order No.		98933	99026	99203	99027	99028
Mounting / Bucket type		R / 1	D / 1	D / 1	D / 1	D / 1
Volume, heaped	m ³ (yd ³)	3,8 (5)	3,8 (5)	4,2 (5,5)	4,5 (6)	4,5 (6)
Volumetric weight	kg/m ³	1800	1800	1600	1500	1500
	(lb/yd ³)	(3000)	(3000)	(2700)	(2500)	(2500)
Working load	kg	6840	6840	6720	6750	6750
	(lb)	(15080)	(15080)	(14810)	(14880)	(14880)
Static tipping load, straight	kg	15370	16140	16150	15920	14980
	(lb)	(33880)	(35580)	(35600)	(35100)	(33025)
at 35° turn	kg	13710	14420	14430	14215	13340
	(lb)	(30225)	(31790)	(31810)	(31340)	(29410)
at full turn	kg	13520	14230	14230	14020	13160
	(lb)	(29800)	(31370)	(31370)	(30910)	(29010)
Breakout force	kN	13910	15370	15340	13940	12660
	(lbf)	(30665)	(33885)	(33820)	(30730)	(27910)
Hydraulic lifting force at ground level	kp	23840	24320	24270	24150	23600
	(lbf)	(52555)	(53615)	(53500)	(53240)	(52030)
at max. height	kp	10640	10915	10880	10820	10520
	(lbf)	(23460)	(24060)	(23990)	(23850)	(23190)
A	mm	8260	8140	8135	8270	8390
	(ft in)	(27'1")	(26'8")	(26'8")	(27'2")	(27'6")
L	mm	6025	5950	6100	6090	6150
	(ft in)	(19'9")	(19'6")	(20')	(20')	(20'2")
V	mm	3200	3200	3200	3200	3200
	(ft in)	(10'6")	(10'6")	(10'6")	(10'6")	(10'6")
a ₁ clearance circle	mm	14480	14780	14780	14845	14910
	(ft in)	(48'8")	(48'6")	(48'6")	(48'8")	(48'11")
E	mm	1395	1285	1280	1405	1515
	(ft in)	(4'7")	(4'2")	(4'2")	(4'7")	(5')
H	mm	3090	3170	3175	3080	2995
	(ft in)	(10'2")	(10'5")	(10'5")	(10'1")	(9'10")
M	mm	1240	1150	1150	1245	1330
	(ft in)	(4'1")	(3'9")	(3'9")	(4'1")	(4'4")
N	mm	1930	1880	1875	1940	1990
	(ft in)	(6'4")	(6'2")	(6'2")	(6'4")	(6'6")
Weight distribution, front	kg	10035	9590	9680	9750	10200
	(lb)	(22120)	(21140)	(21340)	(21495)	(22480)
Weight distribution, rear	kg	11890	12055	12030	12000	11820
	(lb)	(26210)	(26575)	(26520)	(26455)	(26060)
Operating weight	kg	21920	21650	21710	21750	22020
	(lb)	(48330)	(47730)	(47860)	(47950)	(48540)

Spade Nose bucket with teeth (98934 Pin-on)

* SAE carrying position

Capacity	m ³ (yd ³)	3,8 (5)
Volumetric weight	kg/m ³ (lb/yd ³)	1800 (3000)
Machine weight	kg (lb)	21100 (46520)
Static tipping load, at full turn	kg (lb)	13800 (30420)

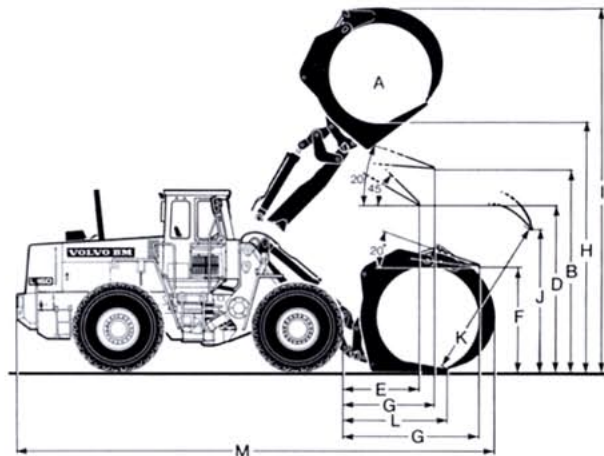
A	mm (ft in)	8465 (27'9")
B	mm (ft in)	6700 (22')
C	mm (ft in)	3550 (11'8")
D	mm (ft in)	470 (1'7")
E	mm (ft in)	1500 (4'11")
F	mm (ft in)	3500 (11'6")
G	mm (ft in)	2000 (6'7")
H	mm (ft in)	2920 (9'7")
J	mm (ft in)	4120 (13'6")
K	mm (ft in)	4405 (14'5")
L	mm (ft in)	5860 (19'3")
M	mm (ft in)	1430 (4'8")
N	mm (ft in)	2160 (7')
O	°	55
P	°	45
R	°	38
R ₁ *	°	44
S	°	66
T	mm (ft in)	90 (3'5")
U	mm (ft in)	415 (1'4")
V	mm (ft in)	3200 (10'6")
X	mm (ft in)	2310 (7'7")
Y	mm (ft in)	3000 (9'10")
Z	mm (ft in)	4000 (13'2")
a ₁	mm (ft in)	7510 (24'8")
a ₂	mm (ft in)	6900 (22'8")
a ₃	mm (ft in)	3810 (12'6")
a ₄	±°	37



Sorting Grapple (99999 Hook-On)

Operating weight	kg (lb)	22275 (49110)
Operating load	kg (lb)	7800 (17195)

A	m ² (ft ²)	3,1 (33)
B	mm (ft in)	3020 (9'11")
C	mm (ft in)	2070 (6'9")
D	mm (ft in)	3130 (10'3")
E	mm (ft in)	1650 (5'5")
F	mm (ft in)	1700 (5'6")
G	mm (ft in)	2945 (9'8")
H	mm (ft in)	5040 (16'6")
I	mm (ft in)	7310 (24')
J	mm (ft in)	3200 (10'6")
K	mm (ft in)	3400 (11'2")
L	mm (ft in)	2275 (7'6")
M	mm (ft in)	9465 (31')



ALTERATION OF DIMENSIONAL DATA		26.5-25/20	26.5-25/20 L2	26.5-25/20 L3	26.5-25/20 L4	26.5-25/20 L5	26.5-25/20 XRDNA
Tires		26.5-25/20	26.5-25/20 L2	26.5-25/20 L3	26.5-25/20 L4	26.5-25/20 L5	26.5-25/20 XRDNA
Liquid ballast in rear tires		75 % CaCl ₂					
Width over wheels	mm (in)	-	12 (0,47)	20 (0,78)	28 (1,1)	20 (0,78)	50 (1,93)
Ground clearance	mm (in)	-	2 (0,08)	2 (0,08)	29 (1,14)	32 (1,26)	± 0
Tipping load at full turn	kg (lb)	1900 (4190)	-60 (-130)	50 (110)	470 (1035)	615 (1355)	110 (240)
Operating weight	kg (lb)	1530 (3370)	95 (130)	70 (160)	780 (1720)	1020 (2250)	184 (405)

STANDARD EQUIPMENT

Safety and comfort

ROPS- and FOPS-tested cab
Cab heater with fresh air intakes provided with filters and defroster
Tinted glass
Ergonomically designed and adjustable driving seat with seat belt
Rear-view mirrors, external, two
Rear-view mirrors, internal one
Lighting:
main headlamps, full- and dipped-beam (asymmetrical, halogen)
parking lights
working lights, front (two), halogen
working lights, rear (two), halogen
sidelights
brake lights
rear lights
cab lighting
instrument lighting
direction indicators

Storage box in cab
Instrument panel with symbols
Sun visor
Safety start
Mudguards
Hazard warning flashers
Windscreen wipers, front and rear windows
Horn
Ash tray
Lighter
Lifting eyes
Lockable toolbox
Pressure gauge for brake system
Outlet for tyre inflation
Ventilation window

Engine & electrical system

Fuel gauge
Socket, 24 V
Battery disconnection switch
Tell-tale lamps for:
front and rear working lights
charging
full-beam headlights
direction indicator flashers
engine oil pressure
transmission oil pressure
differential lock
parking brake
brake pressure
hazard warning flashers
air cleaner
Air cleaner with ejector emptying
Engine temperature gauge
Hydraulic transmission temperature gauge
Hour recorder
Alternator

For certain markets only
Central warning lamp for following functions: Engine oil pressure. Brake pressure. Engine temperature. Transmission temperature. Transmission oil pressure.

Drivetrain

Power Shift transmission
Differential lock (front axle)
Single-lever gear control
Tyres 26.5 R 25*

Hydraulic system

Control valve (three sections)
Bucket position indicator
Boom kick-out
Bucket positioner
Ground positioner
Hydraulic oil cooler
Vane pump

OPTIONAL EQUIPMENT *(Standard equipment on certain markets)*

Inspection and maintenance equipment

Tool kit
Wheel nut wrench
Tyre inflation kit
Engine equipment

Engine heater, electrical
Low exhaust emission version
Suction fan
Preheating coil
Extra fuel filter
Oil-bath pre-cleaner
Underground version
Exhaust cooling
Rain cap for exhaust pipe
High-altitude version

Electrical equipment

Rotating beacon with collapsible mounting

Asymmetrical headlamps (halogen)
Extra working lights, front (halogen 2)
Extra working lights, rear (halogen 2)
Attachment lights (halogen)
Inspection lamp
Back-up alarm
Central warning

Transmission equipment

Automatic Power Shift
4 gears
Automatic Power Shift
3 gears
Interlock for 4th speed

Cab equipment

Radio panel without radio
Passenger seat

Heated driving seat
Windscreen washer, front/rear
Dual brake pedals
Intermittent wiper
Sliding window, bronze tinted glass
Air-conditioner
Lever lock
Speedometer and tachometer
Seat belt
Ventilation fan

Hydraulic equipment

3rd hydraulic control
3rd hydraulic control, return line
4th and 5th hydraulic control

External equipment

Towing hitch
"Slow-Moving Vehicle" sign

Protective equipment

Protecting guards for headlamps
Protecting guards for rear working lights
Silencer guard
Guards for piston roads, high-lift version
Heavy duty safety roof

Other equipment

Germany version
Horn, air operated
Compactor version
Safety steering
Air tank, France
Tropical version
High-lift version
Air operated parking brake

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 BM Company
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