



# Volvo BM L90B

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- **Engine output gross:**  
SAE J1349 115 kW (156 hp)
- **Operating weight:**  
12,6 t (27 785 lb)
- **Buckets:**  
2,1-6,5 m<sup>3</sup> (2,7-8,5 yd<sup>3</sup>)
- *Direct-injected, turbocharged Volvo diesel*
- *Volvo BM Automatic Power Shift*
- *Precision steering and small turning radius*
- *Care Cab – the cab with great comfort and safety*
- *Contronic monitoring system*
- *Loader unit with parallel lift-arm action, high lift height and long reach*
- *Pilot operated hydraulic system*
- *Ample breakout and lifting forces*
- *The largest family of attachments on the market*

**VOLVO BM**

## ENGINE



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

### Air cleaning:

1. Cyclone cleaner with automatic exhaust ejector.
2. Paper filter with indicator in the cab.
3. Safety filter.

Make			Volvo	
Model			TD 61 GB	
Output at	r/s	(r/min)	36,7	(2200)
SAE J1349 Gross	kW	(hp)	115	(156)
Flywheel output at	r/s	(r/min)	36,7	(2200)
SAE J1349 Net	kW	(hp)	109	(148)
DIN 70020 / 6271 Net	kW	(hp)	109	(148)
Max. torque at	r/s	(r/min)	23,3	(1400)
SAE J1349 Gross	Nm	(lbf ft)	640	(472)
SAE J1349 Net	Nm	(lbf ft)	630	(465)
DIN 70020 / 6271 Net	Nm	(lbf ft)	630	(465)
No. of cylinders			6	
Displacement, total	l	(in <sup>3</sup> )	5,48	(334)
Bore	mm	(in)	98,43	(3,87)
Stroke	mm	(in)	120	(4,72)
Compression ratio			16:1	

## ELECTRICAL SYSTEM



*Contronic* monitoring system with extended function surveillance. Solid-state electrical distribution box. The electrical system is well-protected by fuses. Prewired for optional equipment.

### Central warning:

*Central warning lamp for following functions: engine oil pressure, brake pressure, parking brake (buzzer as well), engine temperature (buzzer as well) transmission temperature, transmission oil pressure, secondary steering (optional equipment).*

Voltage	V	24	
Batteries	V	2x12	
Battery capacity	Ah	2x105	
Alternator rating	W / A	1680 / 60	
Starter motor output	kW	(hp)	5,4 (7,3)

## SERVICE REFILL CAPACITIES



Crankcase	l	(US gal)	17	(4,5)
Fuel tank	l	(US gal)	210	(55)
Cooling system	l	(US gal)	53	(14)
Transmission, total	l	(US gal)	33	(8,7)
Drop-box	l	(US gal)	4,7	(1,2)
Front axle, total	l	(US gal)	32,5	(8,6)
Rear axle, total	l	(US gal)	29,5	(7,8)
Hydraulic system	l	(US gal)	130	(34,0)
Hydraulic tank	l	(US gal)	95	(26)

## DRIVE TRAIN



**Torque converter:** single-stage.

**Transmission:** Volvo BM power shift-transmission of countershaft type with directional clutch modulation. Single lever control.

**Axes:** fully floating half-shafts. One-piece cast steel axle housing. Rigid front axle and oscillating rear axle.

**Differential:** 100% differential lock on front axle. Engagement and disengagement by means of switch on cab floor.

**Hub reduction:** Volvo BM manufacture with planetary type hub reduction gears. Low-friction roller bearings on each planetary 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	2,66 : 1		
Transmission, make	Volvo BM		
Model	HT 131		
Running speeds			
1, forward/reverse	km/h	(mile/h)	7,2 (4,5)
2, forward/reverse	km/h	(mile/h)	13,6 (8,5)
3, forward/reverse	km/h	(mile/h)	28,5 (17,7)
4, forward	km/h	(mile/h)	39,7 (24,9)
Measurement with tires	20.5 R 25*		
Front axle, make	Volvo BM		
Model	AH 55 E		
Rear axle, make	Volvo BM		
Model	AH 45 K		
Oscillation	± °		15
	mm	(in)	525 (20,7)

## BRAKE SYSTEM



The brake system meets requirements according to SAEJ1473, EG 71/320 och ISO 3450.

**Service brakes:** fully hydraulically operated power disc brakes. Transmission disengagement when braking preselected with a switch on the instrument panel.

**Secondary:** two independent circuits, axle divided system.

**Parking brake:** disc brake on front axle pinion drive flange. 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 <sup>2</sup>	(in <sup>2</sup> )	405 (62,8)
rear/wheel ea.	cm <sup>2</sup>	(in <sup>2</sup> )	405 (62,8)
Accumulators	2		
volume, total	l	(in <sup>3</sup> )	1,0 (61)
Parking brake area, total	cm <sup>2</sup>	(in <sup>2</sup> )	100 (15,5)

## STEERING SYSTEM



Load-sensing hydrostatic articulated steering.

**Pump:** variable flow axial piston pump fitted to a power take-off on transmission.

**System supply:** steering system supplied from separate steering pump.

**Cylinders:** two double-acting cylinders.

Steering cylinders			2	
Bore	mm	(in)	80	(3,15)
Piston rod diameter	mm	(in)	50	(1,96)
Stroke	mm	(in)	410	(16,1)
Relief pressure	MPa	(psi)	16,5	(2393)
Flow	l/min		91	
	(US gal/min)			(24)
at	MPa	(psi)	10	(1450)
and engine speed	r/s	(r/min)	36,7	(2200)

## CAB



**Safety and comfort:** Tested and approved according to standards: ROPS (ISO/CD 3471-1990, SAE J1040), FOPS (ISO 3449, SAE J231), and meets standard according to "Overhead guards for rider lift trucks" (ISO 6055) and "Operator Restraint System" (SAE J386).

The *Care Cab* has convenient boarding steps and a wide door opening. It is lined on the inside with sound-absorbent material and mounted on 4 rubber pads to damp sound and inhibit vibration.

Large glazed areas, good all-round visibility. The windshield is curved and made of laminated green-tinted glass.

All important operator information is presented clearly visible in front of the operator. Information panel for *Contronic* monitoring system (optional).

**Heater and defroster:** Heating element with filtered fresh air and 4-speed fan with defroster outlets for all windows.

**Operator's seat:** Spring-suspended, adjustable operator's seat with lap belt. The seat is hung on a bracket on the rear wall. The force from the lap belt is absorbed by the seat rails.

Emergency exits			3	
Ventilation	m <sup>3</sup> /min	(ft <sup>3</sup> )	10	(353)
Heating capacity	kW	(Btu/h)	11	(37500)
Operator's seat			ISRI	6000/575

## HYDRAULIC SYSTEM



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

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

**System supply:** system supplied from a separate pump. The pilot system is supplied from a combined pilot/brake pump.

**Valve:** double-acting 3 spool valve. The control valve is governed by a 3 spool pilot valve.

**Lifting function:** the valve has four positions: lifting, neutral, lowering and floating. Disengageable electromagnetic boom kick-out. Adjustable for all positions between maximum reach and full lifting height.

**Tilting function:** the valve has three positions: rollback, neutral and forward tilting. Disengageable electromagnetic tilt positioner adjustable for all desired loading angles.

**Cylinders:** double-acting.

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

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

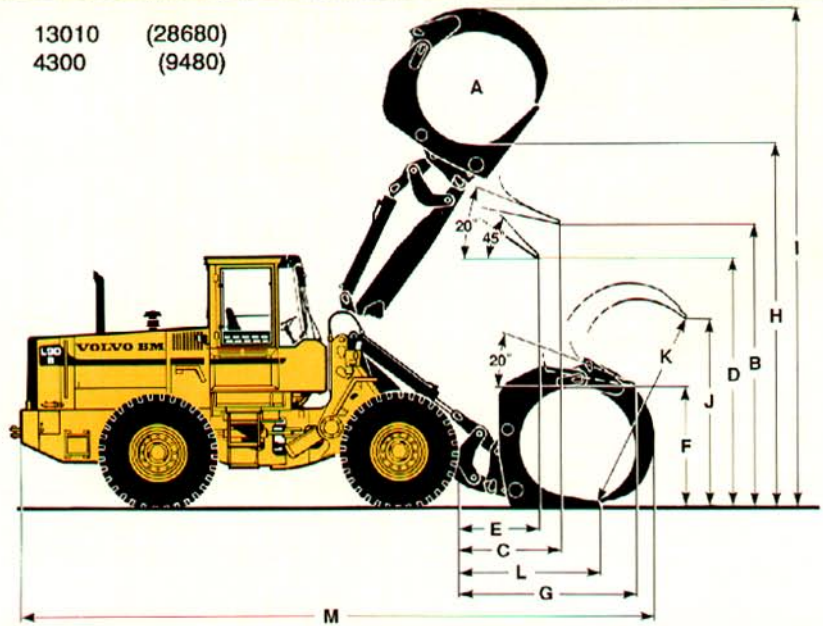
<b>Main pump</b>				
Relief pressure	MPa	(psi)	20,5	(2975)
Flow	l/min		202	
	(US gal/min)			(53,4)
at	MPa	(psi)	10	(1450)
and engine speed	r/s	(r/min)	36,7	(2200)
<b>Pilot pump</b>				
Relief pressure	MPa	(psi)	3,0	(435)
Flow	l/min		25	
	(US gal/min)			(6,6)
at	MPa	(psi)	10	(1450)
and engine speed	r/s	(r/min)	36,7	(2200)
<b>Lifting cylinder</b>				
Bore	mm	(in)	120	(4,7)
Piston rod diameter	mm	(in)	60	(2,4)
Stroke	mm	(in)	980	(38,6)
<b>Tilting cylinder</b>				
Bore	mm	(in)	110	(4,3)
Piston rod diameter	mm	(in)	60	(2,4)
Stroke	mm	(in)	830	(32,7)
Lifting time *	s		6,5	
Tipping time *	s		1,5	
Lowering time (empty)	s		3,0	
Total cycle time	s		11,0	

\* with load, SAE

## SORTING GRAPPLE (90351 Hook-On)

Operating weight	kg	(lb)	13010	(28680)
Operating load	kg	(lb)	4300	(9480)

A	m <sup>2</sup>	(ft <sup>2</sup> )	1,7	(18,3)
B	mm	(ft in)	3315	(10'11")
C	mm	(ft in)	1740	(5'9")
D	mm	(ft in)	2785	(9'2")
E	mm	(ft in)	1400	(4'7")
F	mm	(ft in)	1470	(4'10")
G	mm	(ft in)	2520	(8'3")
H	mm	(ft in)	4330	(14'2")
I	mm	(ft in)	6060	(19'11")
J	mm	(ft in)	2395	(7'10")
K	mm	(ft in)	2590	(8'6")
L	mm	(ft in)	1920	(6'4")
M	mm	(ft in)	8155	(26'9")



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

### Buckets

Straight bucket without teeth	2,1/2,3/2,5 m <sup>3</sup> (2,7/3,0/3,3 yd <sup>3</sup> )
Straight bucket with teeth	2,1/2,3 m <sup>3</sup> (2,7/3,0 yd <sup>3</sup> )
Spade nose bucket without teeth	2,1 m <sup>3</sup> (2,7 yd <sup>3</sup> )
Spade nose bucket with teeth	2,1 m <sup>3</sup> (2,7 yd <sup>3</sup> )
Light materials bucket	4 m <sup>3</sup> (5,2 yd <sup>3</sup> )
High-dump light materials bucket	3,4/6,5 m <sup>3</sup> (4,5/8,5 yd <sup>3</sup> )
Multipurpose bucket	1,7 m <sup>3</sup> (2,2 yd <sup>3</sup> )

### Timber grapples

Unloading grapple	1,7/2,2 m <sup>2</sup> (18,3/23,7 ft <sup>2</sup> )
Sorting grapple	1,7/2,2 m <sup>2</sup> (18,3/23,7 ft <sup>2</sup> )
Tree length grapple	1,3 m <sup>2</sup> (13,9 ft <sup>2</sup> )
Tropical timber grapple	0,9 m <sup>2</sup> (9,7 ft <sup>2</sup> )
Hi-lift swivel wood clamp (SWC)	0,7-2,0 m <sup>2</sup> (7,5-21,5 ft <sup>2</sup> )
Heel kickout	
Log pusher	

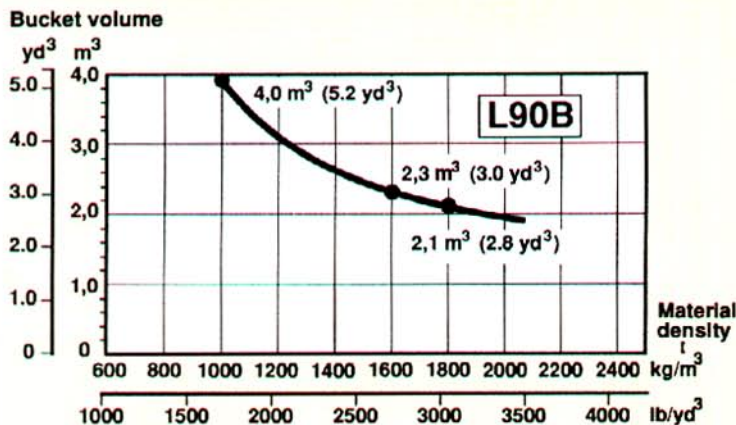
### Examples of other attachments

- Pallet forks
- Breakout forks
- Fork line extension
- Pallet fork with fork positioner
- Combination forks
- Material handling arms
- Hydraulic clamping grapple
- Asphalt cutter
- Diagonal snow blade
- Brooms

## ALTERATION OF DIMENSIONAL DATA

Tires			20.5 - 25/12				
Extra counterweight	kg	(lb)			Counterweight 1	Counterweight 2	
Width over wheels	mm	(in)	± 0		300*)	500**)	
Ground clearance	mm	(in)	± 0		(660)	(1100)	
Tipping load at full turn	kg	(lb)	-100 (-220)		+530	+800	(1760)
Operating weight	kg	(lb)	-220 (-485)		+300	+500	(1100)

## BUCKET SELECTION DIAGRAM



\*) Counterweight 1, 300 kg (660 lb) may be used in all handling.

\*\*\*) Counterweight 2, 500 kg (1100 lb) may only be used for stabilizing purposes within timber and pallet handling on a flat surface with. Counterweight 2 replaces hydroinflation of rear tires.

Combination of counterweights 1 + 2 may only be used for stabilizing purposes within timber and pallet handling on a flat surface.

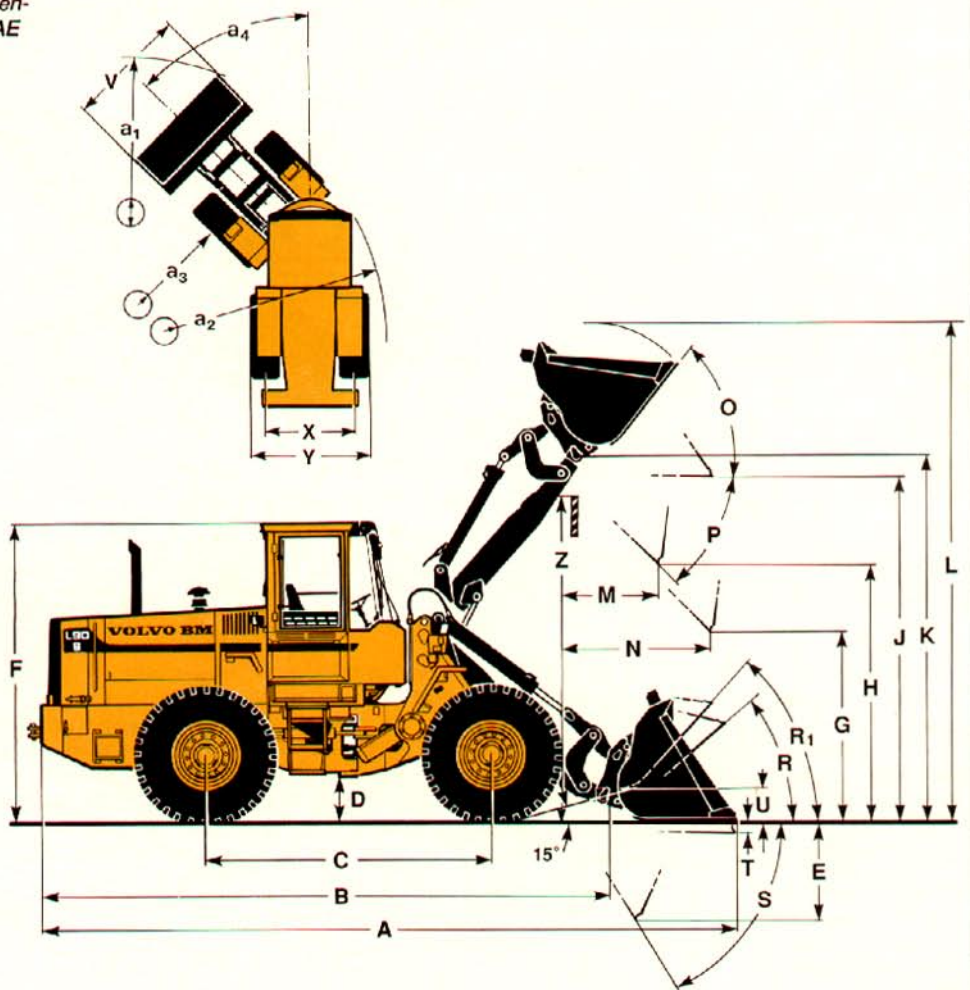
# DIMENSIONAL DATA VOLVO BM L90B

Tires: 20.5 R 25\*

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

B	mm	(ft in)	5990	(19'18")
C	mm	(ft in)	3000	(9'10")
D	mm	(ft in)	410	(1'4")
F	mm	(ft in)	3200	(10'6")
G	mm	(ft in)	2135	(7')
J	mm	(ft in)	3590	(11'9")
K	mm	(ft in)	3810	(12'6")
O	°		53	
P	°		45	
R	°		43	
R <sub>1</sub> *	°		48	
**	°		54	
S	°		58	
T	mm	(ft in)	95	(3,7")
U	mm	(ft in)	375	(1'3")
**	mm	(ft in)	600	(2')
X	mm	(ft in)	1960	(6'5")
Y	mm	(ft in)	2490	(8'2")
Z	mm	(ft in)	3580	(11'9")
a <sub>2</sub>	mm	(ft in)	5360	(17'7")
a <sub>3</sub>	mm	(ft in)	2880	(9'6")
a <sub>4</sub>	± °		40	

\* Carrying position SAE  
\*\* In practical carry position



**Bucket type**

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

Order No.		91367	91360	91368	91361	91369	91362
Mounting / Bucket type		D / 1	R / 1	D / 1	R / 1	D / 1	R / 1
Volume, heaped	m <sup>3</sup> (yd <sup>3</sup> )	2,1 (2,75)	2,1 (2,75)	2,3 (3,0)	2,3 (3,0)	2,5 (3,25)	2,5 (3,25)
Static tipping load, straight	kg	9500	9000	9400	9000	9100	8700
	(lb)	(20900)	(19800)	(20700)	(19800)	(20100)	(19200)
at 35° turn	kg	8300	7900	8300	7900	8000	7700
	(lb)	(18300)	(17400)	(18300)	(17400)	(17600)	(17000)
at full turn	kg	8000	7600	7900	7600	7700	7300
	(lb)	(17600)	(16800)	(17400)	(16800)	(17000)	(16100)
Breakout force	kN	120,7	110,3	120,7	110,2	108,3	99,4
	(lbf)	(27130)	(24800)	(27130)	(24770)	(24350)	(22350)
A	mm	7200	7270	7185	7270	7300	7380
	(ft in)	(23'8")	(23'10")	(23'7")	(23'10")	(23'11")	(24'3")
L	mm	5000	5050	5100	5150	5100	5150
	(ft in)	(16'5")	(16'7")	(16'9")	(16'11")	(16'9")	(16'11")
V	mm	2650	2650	2650	2650	2650	2650
	(ft in)	(8'8")	(8'8")	(8'8")	(8'8")	(8'8")	(8'8")
a <sub>1</sub> clearance circle	mm	11820	11870	11820	11870	11880	11930
	(ft in)	(38'9")	(38'11")	(38'9")	(38'11")	(39')	(39'2")
E	mm	1010	1080	1010	1080	1110	1180
	(ft in)	(3'4")	(3'7")	(3'4")	(3'7")	(3'8")	(3'10")
H	mm	2810	2750	2810	2750	2730	2670
	(ft in)	(9'3")	(9')	(9'3")	(9')	(8'11")	(8'9")
M	mm	1050	1110	1050	1110	1130	1190
	(ft in)	(3'5")	(3'8")	(3'5")	(3'8")	(3'9")	(3'11")
N	mm	1610	1650	1610	1650	1660	1690
	(ft in)	(5'3")	(5'5")	(5'3")	(5'5")	(5'5")	(5'7")
Weight distribution, front	kg	5250	5400	5270	5440	5490	5670
	(lb)	(11580)	(11900)	(11620)	(11990)	(12100)	(12500)
Weight distribution, rear	kg	7100	7040	7100	7030	7030	6950
	(lb)	(15650)	(15520)	(15650)	(15500)	(15500)	(15320)
Operating weight	kg	12350	12440	12370	12470	12520	12620
	(lb)	(27230)	(27420)	(27270)	(27490)	(27600)	(27820)

## STANDARD EQUIPMENT

### Safety & comfort

ROPS- and FOPS-cab  
 Cab heating with filtered fresh air intake and defroster  
 Tinted glass  
 Ergonomically designed and adjustable operator's seat with seat belt  
 Rear-view mirrors, external, two  
 Rear-view mirrors, internal, one  
**Lighting:**  
 main headlamps, full-dipped beam/asym. (halogen)  
 working lights, front (two, halogen)  
 working lights, rear (two, halogen)  
 parking lights  
 brake lights  
 tail lights  
 cab lighting  
 instrument lighting  
 workinglight dependent parkinglight

Instrument panel with symbols  
 Sun visor  
 Safety start  
 Hazard warning flashers  
 Windscreen wipers, front and rear  
 Intermittent wipers, front  
 Horn  
 Ashtray  
 Cigarette lighter  
 Lifting eyes  
 Opening window  
 Wrist support  
 Antiskid tape  
 Filepocket  
 Leverlock  
 Radio console without radio  
 Lockable engine hoods

### Engine & electrical system

Contronic monitoring system  
 Electric socket 24V  
 Battery disconnection switch  
 Alternator  
 Rain cap  
 Air cleaner with ejector discharge  
 Engine temperature gauge  
 Hydraulic transmission temperature gauge  
**Warning lamps for:**  
 working lights, front / rear charging  
 full-beam headlights  
 direction indicators  
 engine oil pressure  
 transmission oil pressure  
 differential lock  
 parking brake  
 brake pressure  
 hazard flashers  
 air cleaner  
 Hour recorder  
 Fuel gauge

### Central warning:

Engine oil pressure  
 brake pressure  
 parking brake (with buzzer)  
 engine temperature (with buzzer)  
 transmission temperature  
 transmission oil pressure

### Drivetrain

Power Shift transmission  
 Automatic Power Shift (APS)  
 Differential lock, front axle  
 Single-lever shift control  
 Tires 20.5 R25\*

### Hydraulic system

Vane pump  
 Control valve (3-spool)  
 Pilot valve (3-spool)  
 Bucket positioner  
 Boom kick-out  
 Bucket position indicator  
 Hydraulic oil cooler

## OPTIONAL EQUIPMENT *(Standard on certain markets)*

### Service and maintenance equipment

Lockable tool box  
 Tool kit  
 Wheel nut wrench kit  
 Extended lube points  
 Air pressure equipment

### Engine equipment

Electrical engine block heater  
 Preheating coil  
 Oil-bath pre-cleaner  
 Low-emission version  
 Extra fuel filter  
 Cyclone pre-cleaner  
 Coolant filter  
 High-altitude version  
 Radiator corrosion protected

### Electrical equipment

Back-up alarm  
 Brushless alternator

Extra working lights, front (two), halogen  
 Extra working lights, rear (two), halogen  
 Attachment light, (halogen)  
 Left-hand asymmetrical headlights (halogen)  
 Side marker lights  
 Rotating beacon with collapsible mounting  
 Registration plate light  
 Radio

### Transmission equipment

Switch, forward/reverse shifting  
 Dual brake pedals

### Cab equipment

Heated operator's seat  
 Air suspended operators seat  
 Speedometer and tachometer  
 Sliding window  
 Instructor's seat  
 Parking-brake alarm, acoustic

**Information panel Contronic:**  
 startup, settings language and units, operating hours  
 operating information, stop watch, tripmeter, cycle counter, service intervals  
 engine  
 electrical system  
 transmission  
 Cable, information panel service  
 Air conditioning  
 Titable steering wheel  
 Windshield washers, front / rear  
 Throttle lockable

### Hydraulic equipment

3rd hydraulic control  
 3rd and 4th hydraulic control  
 5th hydraulic control  
 Single-acting lifting function  
 Boom lowering system  
 Hydraulic attachment bracket  
 Separate attachment locking  
 Automatic hose coupler (AHC)  
 Hydraulic parking brake  
 Boom Suspension System

### External equipment

Extended mudguards  
 Towing hitch  
 Counterweight 1  
 Counterweight 2

### Protective equipment

Protective grilles for headlights  
 Protective grilles for rear working lights  
 Protective grilles for rear lights  
 Underbody protection guard

### Other equipment

Secondary steering  
 Air horn  
 Tires 20.5 x 25  
 Comfort Drive Control (CDC)  
 Fueling strainer  
 Slow moving vehicle sign

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.

**VME Industries Sweden AB**

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