

# VOLVO BM 693



## *Specification Volvo BM 693 Mobile Crane*

### **Compact and manoeuvrable**

A compact materials handler with small overall dimensions and good off-road mobility.

### **Rapid mobility**

Flexibility and high efficiency thanks to the fact that the operator controls the machine and the crane from the same position. This permits quick job changes and moves on the worksite.

### **Effective crane**

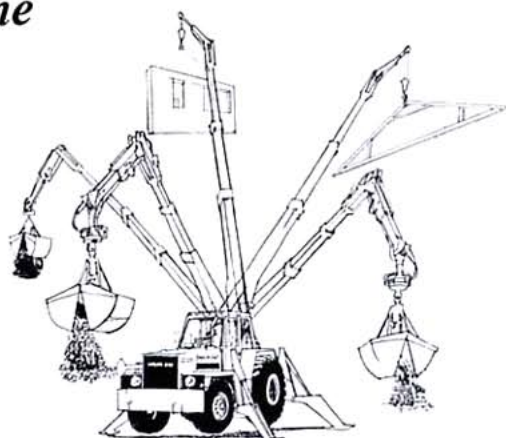
A crane with good reach, lifting height and load values designed for high-volume materials-handling jobs.

### **Superb control**

The flexible boom provides good accessibility in tight spots and has unique control characteristics, thanks to its construction combining telescopic main boom with hydraulic telescopic fly jib. This permits efficient materials handling with attachments or lifting hook.

### **Wide range of attachments**

The crane's area of application is broadened by the range of attachments including personnel cage, grab bucket for gravel, concrete or deep digging, grapple for timber/pulp wood, hydraulic hammer for rock clean-up etc.





## ENGINE

Volvo BM D 42

Rating	59 kW at 38.4 rev/s SAE gross (standard J 270) (80 hp at 2300 rev/min) SAE gross (standard J 270) 55 kW at 38.4 rev/s DIN (standard 70020) (75 hp at 2300 rev/min) DIN (standard 70020)
Max. torque	270 Nm at 23.4 rev/s SAE gross (standard J 270) (198 lbf ft at 1400 rev/min) SAE gross (standard J 270) 250 Nm at 23.4 rev/s DIN (standard 70020) (185 lbf ft at 1400 rev/min) DIN (standard 70020)

Cyl. diameter	105.57 mm (4.16 in)
Stroke	120.0 mm (4.72 in)
No. of cylinders	4
Displacement	4.2 litres (256 in <sup>3</sup> )

Four-cylinder, direct-injected, four-cycle diesel engine with overhead valves and wet replaceable cylinder linings plus balancing unit for vibrationless operation.

The cleaning system for air intake to the engine is of the two-stage type.

1. Pre-cleaner of cyclone type
2. Cyclone cleaner with paper filter and high-efficiency catch-all filter.

An indicator to the right of the instrument panel shows red when the filter is clogged and when it is time to clean or change the filter.



## ELECTRICAL SYSTEM

Voltage	12 V
Alternator	140 W
Battery capacity	160 Ah
Batteries	two 6 V, connected in series
Starter motor	3 kW (4 hp)

The batteries are located in a drawer above the left-hand boarding ladder and are easily accessible when the drawer has been pulled out. The alternator guarantees sufficient charging even at low engine speeds and the powerful starter motor permits easy starts even at low temperatures. The fuses are well-protected in boxes underneath the front and rear instrument panels.



## CLUTCH

Type: Single-disc dry-plate clutch with sintered pads.  
Diameter: 13".



## GEARBOX

Type: Mechanical with low and high ranges, each with four speeds.

No. of gears forward/reverse: 8/2

Speeds in km/h (mph) at 2300 rev/min and tyres 18.00–25

Low 1	2.8 (1.7)	High 5	9.0 ( 5.6)	Reverse L	3.4 (2.1)
2	4.8 (3.0)	6	13.6 ( 8.5)	Reverse H	11.0 (6.8)
3	6.3 (3.9)	7	20.4 (12.7)		
4	8.3 (5.2)	8	26.7 (16.6)		



## AXLES

Type: Volvo BM

Drive axle with final drives in a centrally located final drive housing.

Differential lock, type Volvo BM, with 100% lock-up with claw clutch.

Front axle of box construction with  $\pm 14^\circ$  oscillation.



## BRAKES

Fully-enclosed dual disc brakes located before the final drives. Hydraulic operation via pedal.

Parking brake: Mechanical operation via lever.



## TYRES

Front	14.5–20/10
Rear	18.00–25/12



## STEERING SYSTEM

Hydrostatic with twin cylinders on steering axle.

Pump  
Pump capacity

Gear pump, type Volvo BM  
36 l/min (9.5 US gal/min, 7.9 Imp. gal/min)  
at 2300 rev/min  
9 MPa (18.4 lb/in<sup>2</sup>)

Working pressure

The machine can be steered in the event of a pressure loss.



## HYDRAULIC SYSTEM

The crane has three separate hydraulic circuits, each with its own pump. Pump I delivers oil to steering and crane slew. Pump II, III is a twin pump where one pump supplies the winch with oil and the other delivers oil to the outriggers and boom functions.

Pump I	See data under "Steering system"
Pump II, III	Gear pump
Pump capacity	95/76 l/min (25/20 US gal/min, 21/17 Imp. gal/min) at 2300 rev/min
Working pressure	15/19.5 MPa (2133/2770 lb/in <sup>2</sup> )



## VOLUMES

	Litres (US gal, Imp. gal)	
Cooling system	16	( 4.22, 3.52)
Engine oil, incl. filter	12	( 3.17, 2.64)
Oil in gearbox plus rear axle casing	74	(19.5, 16.2)
Slew gear	3	( 0.79, 0.66)
Fuel tank	95	(25.1, 20.9)
Hydraulic system	140	(37.0, 30.8)
Hydraulic oil tank	114	(30.1, 25.1)
Winch gear	0.5	( 0.13, 0.11)



## WEIGHTS

Working weight including oils, coolant, full fuel tank and operator, tyres 18.00–25 and 14.5–20 with liquid filling and crane in transport position.

Total weight	12 920 kg (28 484 lb)
Front axle	4 010 kg ( 8 841 lb)
Rear axle	8 910 kg (19 643 lb)
Working weight with max. mobile load 2 000 kg (4 409 lb) 1 m out in front of the machine.	
Front axle	7 820 kg (17 240 lb)
Rear axle	7 100 kg (15 653 lb)

Crane at work: Max. ground pressure under outrigger with max. static load over one outrigger 0.47 MPa (68.3 lb/in<sup>2</sup>). Corresponds to a force of 10 000 kgf (22 046 lbf) under the outrigger.



## CAB

The cab is separate from the chassis and mounted on rubber pads in order to insulate it from vibrations and structure-borne sound.

The cab has a flat floor, suspended pedals and plenty of room to permit the seat to be swung around from the transport to the crane operation position. Readable-at-a-glance instrumentation, pedals and controls conveniently located in relation to seat and steering wheel.



## CRANE

The boom is articulated and the two parts are called the main boom and the fly jib.

The main boom is telescopic and consists of three telescope tubes. Extension and retraction is effected by a hydraulic cylinder which transmits its movement via two chains to the two sliding telescope tubes.

The fly jib is carried in the inner tube. Both angular positioning and extension of the fly jib telescope are effected by hydraulic cylinders. All boom functions can be performed under load. The fly jib can also be locked in the straight position for heavy lifting jobs or work with the extension boom.

The boom has three-point suspension so it does not load the chassis unit.

The slewing function is driven by a hydraulic motor which, via a gear, drives a gear ring on the crane mast bearing. A hydraulically controlled slewing brake applies braking effort with spring force when the control lever is moved to the neutral position.

A rotor coupling between the frame and the crane mast permits unlimited rotation in both directions.

Max. lifting moment	20.5 tonm (148 276 lbf ft)	} (Data with extension booms, see chart)
Max. net load, short boom (2 m)	7 000 kg (15 430 lb)	
Max. net load, full boom (13.5 m)	950 kg (2 095 lb)	
Max. hook load, transport	2 000 kg (4 409 lb)	
Max. reach from centre of slew	13.5 m (29 lb)	
Max. hook height	16 m (52 ft)	
Max. boom angle	75°	

Crane movements: engine speed 30 rev/s (1800 rev/min)

Extension of main telescope to max. length 5 m	25 s
Retraction of main telescope to max. length 5 m	17 s
Raising of boom from 0° to 75°	25 s
Lowering of boom from 75° to 0°	25 s
Extension of fly jib 1.25 m	7 s
Retraction of fly jib 1.25 m	6 s
Raising of fly jib 114°	9 s
Lowering of fly jib 114°	12 s
Slew speed	2 r/min



## WINCH

The winch is mounted in the crane mast and is driven by a hydraulic motor. The winch is operated by either a lever or a foot pedal.

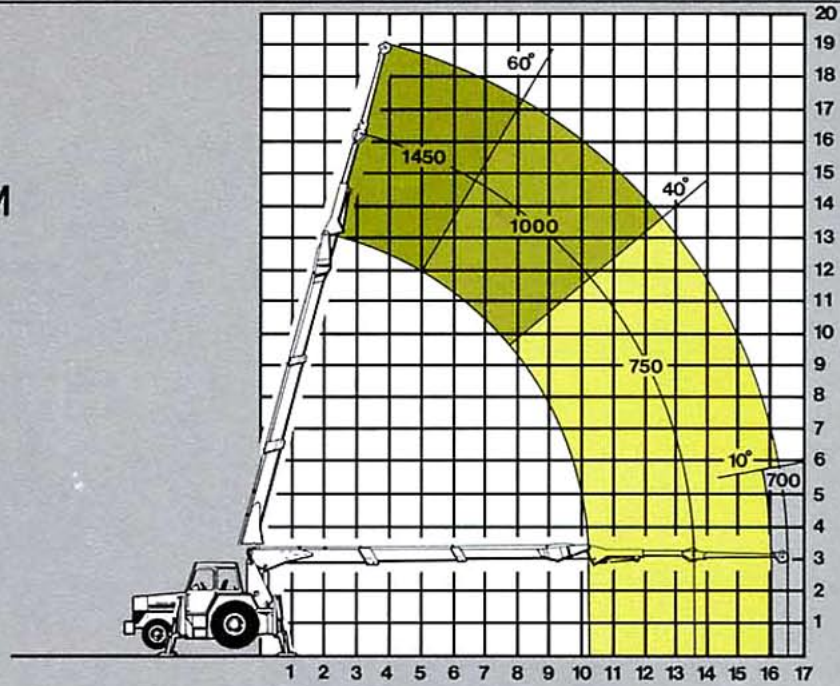
Make	Siebenhaar				
Max. tractive power	14.2 kN (3 196 lbf) on the third rope layer				
Max. rope speed	41 m/min (135 ft/min)				
Max. permissible load					
No. of rope parts	1	2	3	4	5
Permissible load, kg	1 450	2 850	4 300	5 700	7 000
	(lb) (3 196)	(6 283)	(9 480)	(12 566)	(15 432)

Rope: dia. = 12 mm, 144 strands, non-twist



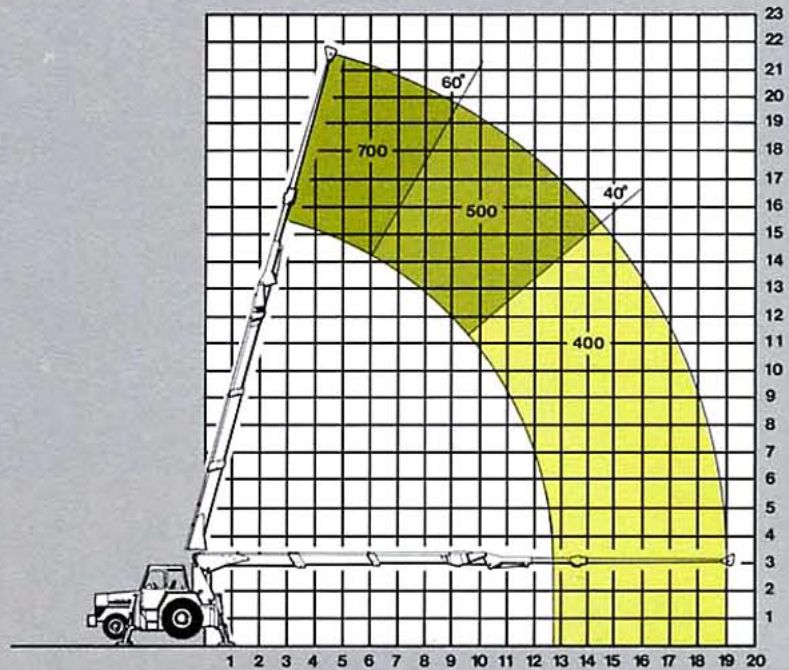
## LIFTING CAPACITY WITH 3.0 m EXTENSION BOOM

Lifting capacity with 3.0 m extension boom. With the extension boom, max. 1 450 kgf (3 196 lbf) can be lifted (permissible load with single rope part). The fly jib cylinder shall be relieved of the load by means of the locking brace when the extension boom is being used.



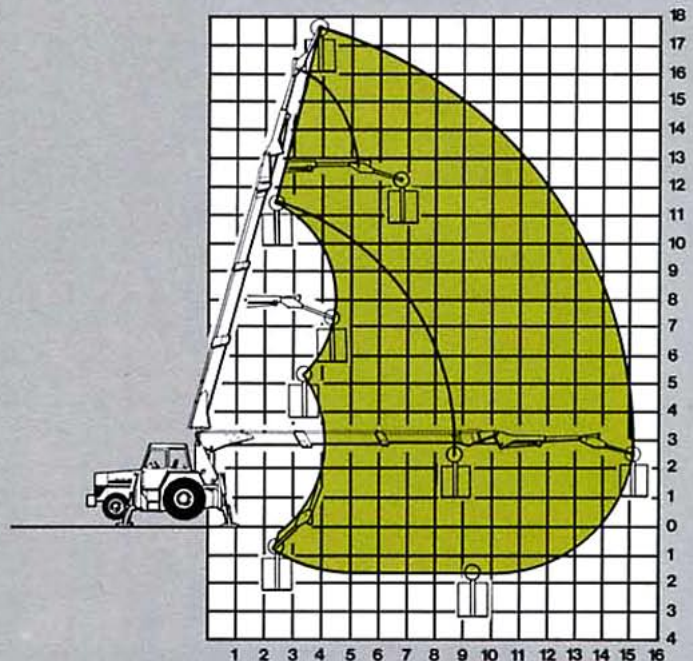
## LIFTING CAPACITY WITH 5.0 m EXTENSION BOOM

Lifting capacity with 5.0 m extension boom. With the extension boom a maximum of 700 kgf (1 543 lbf) can be lifted. The fly jib cylinder shall be relieved of the load by means of the locking brace when the extension boom is being used.



## WORKING RANGE FOR PERSONNEL CAGE

The working range for the Volvo BM 693 with personnel cage, intended for two persons + 100 kg (220 lb) or one person + 200 kg (440 lb).



# STANDARD EQUIPMENT



## SAFETY & COMFORT

- Rear-view mirrors, outer
- Main headlights, 2
- Working lights, 2
- Parking/position lights
- Taillights and brake lights
- Direction indicators
- Instrument lighting
- Cab lighting
- Horn
- Horizontal indicator
- Load moment indicator
- Hose failure valves
- Lowering speed valves
- Ashtray
- Wipers for front, rear and roof windows
- Point of attachment for safety belt
- Tool boxes, 2
- Cab heating
- Compartment for inspection booklet
- Front fenders
- Compartment for instruction manual etc.



## ENGINE & ELECTRICAL SYSTEM

- Thermometer, engine
- Oil pressure gauge
- Fuel gauge
- Master switch
- Indicator for air cleaner
- Electrical indication for hydraulic oil filter
- Pilot lamps for: charging, main beams, direction indicators, working lights
- Electrical outlet for front load warning beacon
- Hour counter
- Alternator



## TRANSMISSION

Differential lock



## HYDRAULIC SYSTEM

Measuring outlets, quick-coupling type, four

# EXTRA EQUIPMENT



Optional features:

- Selector valves
- Working lights which follow the load

- Turbocharging
- Tropical equipment
- Hydraulic oil cooler
- Air conditioning
- Sun curtains

Snap-on attachments:

- Mounting device for rotator
- Rotator
- Hose assembly for rotator

- Extension piece between rotator and attachment
- Grab bucket
- Log grapple
- Polygrip bucket
- Pallet fork
- Culvert hook
- Personnel cage
- Extension booms
- Fixed hook

- Four-ton sheave block
- Rock clean-up equipment
- Warning device/beacon for wide load
- Concrete container



## RANGE OF ATTACHMENTS

A wide range of attachments is available for the 693. The attachments have been developed for optimum capacity and economy on different jobs. For further information, send for the special prospectus.

*Specifications and design are subject to change without notice. The illustrations do not always show the standard versions of the machines.*

# VOLVO BM

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