

# VOLVO BM 861



*The dumper shown on the illustration is equipped with an extra oil bath air cleaner.*

## *Specification Volvo BM Dumptruck 861*

### RELIABLE

The 861 is designed throughout for tough, demanding service. It has a simple basic construction with compatible tried-and-tested Volvo standard components. The 861 is therefore very reliable, requiring a minimum of maintenance and service to achieve optimum economy.

### PERFORMANCE

The powerful, fuel-thrifty Volvo turbo-charged engine gives the 861 power to spare. Good acceleration and good negotiability make for high average speeds and fast haulage cycles.

### NEGOTIABILITY

The 861 has six large wheels with independent suspension producing excellent "floatability". Four-wheel drive, articulated steering, bogie and differential locks all go to make the 861 the premier off-road haulage vehicle.





## ENGINE

Make Volvo  
 Model TD 60B  
 Type Turbo charged diesel engine

Flywheel rating	107.5 kW at 41.5 r/s, DIN 70020 (146 hp at 2 500 r/min)
Gross rating	125 kW at 41.5 r/s, SAE gross J 816 (170 hp at 2 500 r/min)
Max. torque	445 Nm at 33.5 r/s, DIN 70020 (328 lbf ft at 2 000 r/min)
Max. torque, gross	503 Nm at 33.5 r/s, SAE J 816 (371 lbf ft at 2 000 r/min)
Number of cylinders	6
Cylinder diameter	98.425 mm (3.87 in)
Stroke	120 mm (4.72 in)
Displacement	5.48 dm <sup>3</sup> (334 in <sup>3</sup> )
Compression ratio	16:1
Cold start	Richer fuel mixture
Air filter	Dry air cleaner



## TYRES

Front: Rim 13.00—25  
 Tyre 18.00—25 Radial or Cross-ply  
 Rear: Rim 17.00 W—25  
 Tyre 20.5—25 Radial or Cross-ply  
 Ground pressure: see special table on page 4.



## STEERING SYSTEM

Articulated steering with hydraulic operation of two double-acting cylinders.

Max. working pressure	12 MPa (1700 lb/in <sup>2</sup> )
Turns of wheel between locks	3.5 turns
Steering angle from centre line	45°
Lock-to-lock steering time	~ 5.2 s at 25 r/s (1500 r/min)
Steering cylinders, type	Double-acting



## ELECTRICAL SYSTEM

Voltage 12 V  
 Battery 150 Ah  
 Alternator 450 W  
 Starter motor 3 kW (4 hp)



## TRANSMISSION

Torque converter, type	single-stage with free-wheel stator
Conversion ratio	2.3:1
Hydraulically operated gearbox	type Power shift
Make	Volvo BM
Number of gears	4/4
Speeds, forward — reverse	0—6 km/h (0—3.7 mph) 0—10 km/h (0—6.2 mph) 0—18 km/h (0—11.2 mph) 0—30 km/h (0—18.6 mph)



## HYDRAULIC SYSTEM

Pump, type (working hydraulics & steering): Vane pump

The hydraulic pump is mounted on the righthand side of the engine and is driven directly from the engine.

Make	Vickers
Capacity at 41.5 r/s 2500 r/min	130 l/min 2.2 dm <sup>3</sup> /s (34 US gal/min, 29 imp. gal/min)
Working pressure	12 MPa (1700 lb/in <sup>2</sup> )
Ratio engine — hydraulic pump	1:0.8
Filter:	
Suction line	Strainer
Return line	Replaceable paper filter over magnetic core (full flow)
Refill	Paper filter



## AXLES

Tractor unit: integral part of transmission  
 Make Volvo BM  
 Differential lock 100 %

Trailer (bogie) drive axle:	
Make	Volvo
Type	RAN 3—80
Differential lock	100 % locking
Trailing axle:	
Make	Volvo BM



## TIPPING MECHANISM

Tipping cylinders, type	6-stage single-acting
Tipping angle	70°
Tipping time with load	~ 18 s
Lowering time	~ 18 s



## BRAKE SYSTEM

Type: Dual-circuit brake system  
 Driving brakes: Front Air-hydraulic  
 Rear Air-mechanical

Parking brake	Spring-actuated brake on bogie axles
Front axle, type	Disc brakes
Diameter of disc	460 mm (18 in)
Number of friction pads per brake	2
Bogie, type	Drum brakes
Make	Drive axle Volvo Trailing axle Volvo
Diameter of brake drum	394 mm (15.5 in) 413 mm (16.3 in)
Friction pads, number/drum	2 2



## PNEUMATIC SYSTEM

Compressor, make Bosch  
 Displacement 0.225 dm<sup>3</sup> (13.7 in<sup>3</sup>)  
 Drive V-belt  
 Outlet for tyre pumping Yes

Pressure regulator:	
Relief pressure, max.	0.75 MPa 106 (lb/in <sup>2</sup> )
Compressed air reservoir:	
Tractor unit	6 + 15 dm <sup>3</sup> (l) (1.6 + 40 US gal, 1.3 + 3.3 imp gal)
Trailer unit	6 + 15 + 20 + 20 dm <sup>3</sup> (l) (1.6 + 4.0 + 5.3 + 5.3 US gal, 1.3 + 3.3 + 4.4 + 4.4 imp gal)



## FRAMES

The frame oscillation joint permits continuous rotation. Torsional stresses in the framework are eliminated. This has permitted the use of a rigid rear frame made of welded box sections and a front frame made of pressed channel sections.

Tractor unit, type  
Trailer unit, type

Open channel sections  
Welded box sections



## VOLUMES

Engine oil, incl. filter

Approx 17 dm<sup>3</sup> (l) (4.5 US gal, 3.7 Imp gal)

Fuel tank

280 dm<sup>3</sup> (l) (74 US gal, 61.6 Imp gal)

Cooling system

30 dm<sup>3</sup> (l) (8.0 US gal, 6.6 Imp gal)

Hydraulic system

160 dm<sup>3</sup> (l) (42.3 US gal, 35 Imp gal)

Hydraulic tank

135 dm<sup>3</sup> (l) (35.7 US gal, 29 Imp gal)

Hydraulic transmission

22 dm<sup>3</sup> (l) (5.8 US gal, 4.8 Imp gal)

Hydraulic transmission at oil change

18 dm<sup>3</sup> (l) (4.8 US gal, 4.0 Imp gal)

incl oil filter

Differential — final drive, tractor unit

90 dm<sup>3</sup> (l) (23.7 US gal, 19.8 Imp gal)

Reduction gearbox

1.6 dm<sup>3</sup> (l) (0.42 US gal, 0.35 Imp gal)

Differential and hub reduction, trailer unit

33 dm<sup>3</sup> (l) (8.7 US gal, 7.3 Imp gal)



## CAB

The cab is mounted on rubber pads, insulated weatherlight and has a flat floor with a rubber mat. Tested and approved as a safety cab in accordance with the ROPS standards.

Heater and defroster: Heating element with fresh air heating and two-speed fan plus defroster.

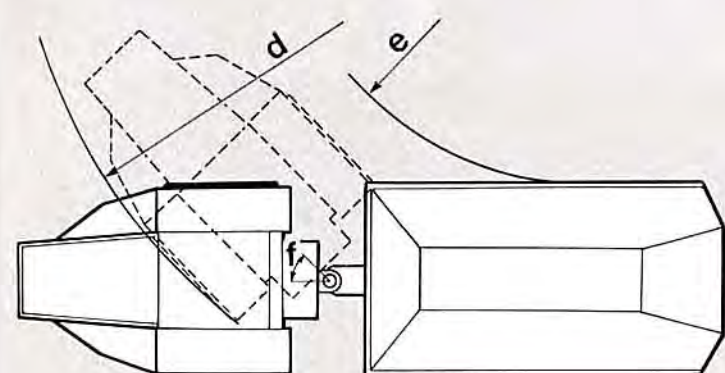
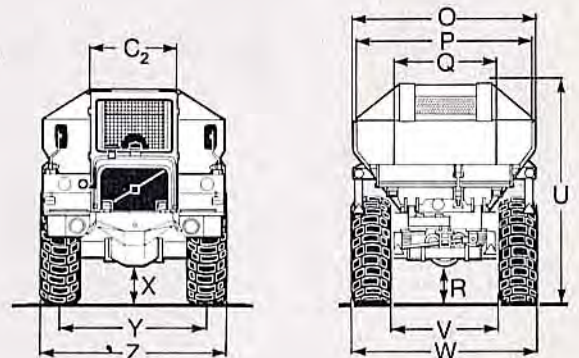
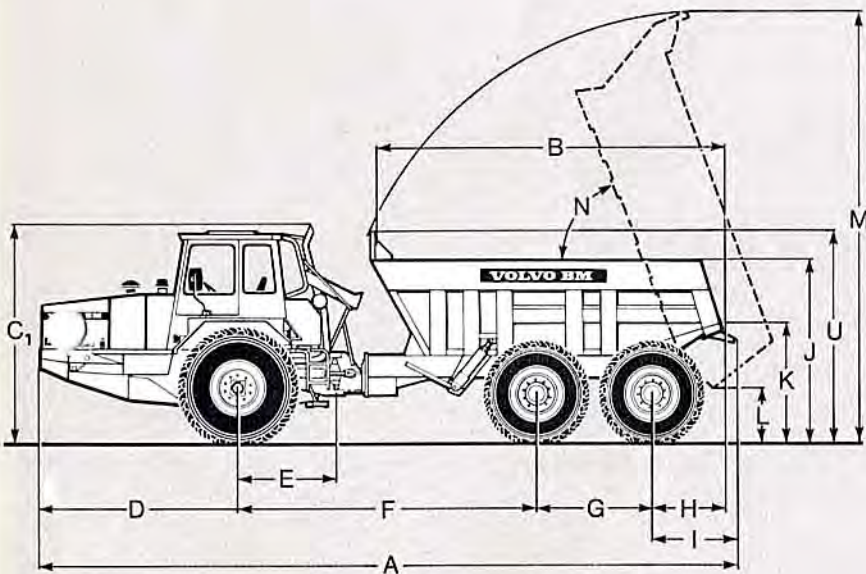
Upholstery Flameproof

Points of attachment for safety belt

Yes

Number of exits

3 (doors and cab hatch)



## STANDARD MACHINE DIMENSIONS 861

mm (in)		mm (in)	
A = 9400 (370)		N = 70°	
B = 4655 (183)		O = 2480 (89)	
C <sub>1</sub> = 2890/2900* (114/118)*		P = 2380 (93.7)	
C <sub>2</sub> = 1360 (55)		Q = 1491 (58.7)	
D = 2720 (107)		R = 395 (15.6)	
E = 1280 (50)		U = 2800 (110)	
F = 4050 (159)		V = 1940 (76)	
G = 1540 (61)		W = 2500 (98)	
H = 1010 (40)		X = 420 (16.5)	
I = 1090 (43)		Y = 1960 (77)	
J = 2440/2495* (96/98)*		Z = 2500 (98)	
K = 1585/1640* (63/65)*		d = 7500 (295)	
L = 720/775* (28/31)*		e = 4100 (162)	
M = 5719/5775* (225/227)*		f = 45°	

\* = unladen machine

(cross ply tyres 18.00—25/20.5—25)

L with rear extension = 280 mm (11 in)



## WEIGHTS

Working weight (oils, coolant, fuel tank, driver, cross ply tyres and standard body).

	Front axle	Bogie	Total weight
Unladen machine	7290 kg (16070 lb)	5570 kg (12280 lb)	12860 kg (28350 lb)
Machine with max. load, 18500 kg (40785 lb)	10500 kg (23150 lb)	20880 kg (46040 lb)	31380 kg (69190 lb)



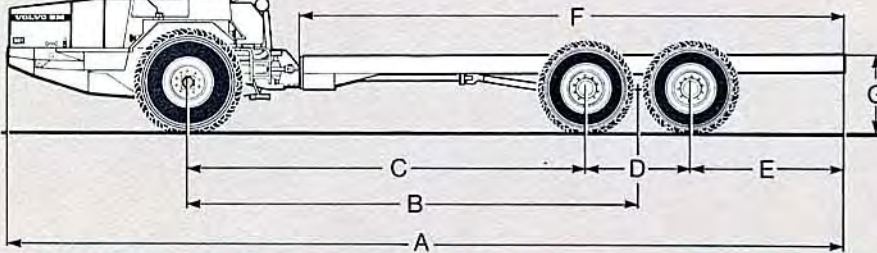
## GROUND PRESSURE

Ground pressure at 15% slump of unladen diameter and 10500 kg (23150 lb) front axle load, 20880 kg (46040 lb), bogie load.

	Tyres	Unladen kPa (lb/in <sup>2</sup> )	Laden kPa (lb/in <sup>2</sup> )
Front axle	18.00–25	88 (12.8)	132 (19)
Bogie	20.5–25	38 ( 5.5)	138 (20)
Front axle	23.5–25	73 (10.6)	109 (15.8)

## TERRAIN CHASSIS 861 TC

Volvo BM 861 TC, a "free-frame" version made for heavy superstructures and haulage over difficult terrain.



	TC 59 mm (in)			TC 40 mm (in)		
	Front	Rear	Total	Front	Rear	Total
Frame length, trallor unit	8010 (315)			4145 (163)		
Max. width, front	2500 ( 98)			2500 ( 98)		
Track, front	1960 ( 77)			1960 ( 77)		
Max. width, rear	2500 ( 98) with 20.5×25 tyres			2500 ( 98) with 20.5×25 tyres		
Track, rear	1940 ( 76) with 20.5×25 tyres			1940 ( 76) with 20.5×25 tyres		
Chassis weight*, kg (lb)	6840 (15079)	3940 (8686)	10780 (23765)	6740 (14858)	3540 (7804)	10280 (22662)
Load, incl. superstructure, kg (lb)	3660 (8068)	17460 (38490)	21120 (46558)	3760 (8289)	17860 (39372)	21620 (47661)
Total weight, kg (lb)	10500 (23147)	21200 (46735)	31700 (69882)	10500 (23147)	21200 (46735)	31700 (69882)

## DIMENSIONS 861 TC, mm (in)

	TC 59 mm (in)	TC 40 mm (in)
A	12430/12650** (489/498)**	9200/9420** (362/371)**
B	6630 (261)	4818 (190)
C	5910 (233)	4050 (159)
D	1600 ( 63)	1540 ( 61)
E	2200 ( 87)	250 ( 10)
F	8010 (315)	4145 (163)
G	1207 ( 47)	1175 ( 46)
H frame width	840 ( 33)	840 ( 33)

\* Chassis weight includes oils, coolant, full fuel tank, driver, cross ply tyres.

\*\* With front-mounted hydraulic pump.



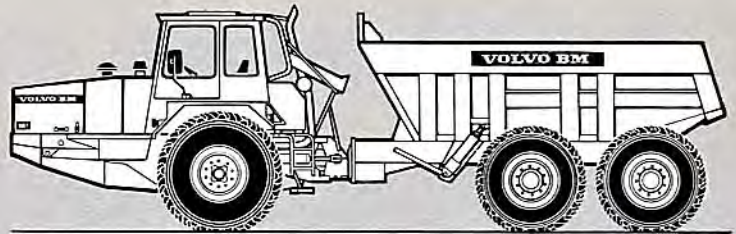
## DUMPER BODIES Standard body\*\*

The body is designed and built to facilitate the fast loading of loose materials. It is fabricated from a lighter than normal, hardened steel plate with very high impact-resistant properties, even at low temperatures. This special steel plate reduces the body weight and increases payload capacity.

The extended body headboard protects the cab and the driver from spill impact. To enable the driver to keep an eye on the loading operation and the load itself during transit, a viewing window is built into the headboard.

The sides are reinforced externally with pressed channel sections welded to the body.

The body has been designed to work efficiently with any loader or excavator on the market today. The body shape ensures that the weight of a capacity load of loose excavated material is distributed correctly over the axles. This improves stability, increases traction and reduces high stress loadings.



Body volumes (SAE 2:1*)	Without tailboard	With underhung tailboard	With underhung/overhung tailboard
Body volume struck, m <sup>3</sup> (yd <sup>3</sup> )	8.7 (11.4)	9.0 (11.8)	9.3 (12.2)
heaped SAE, m <sup>3</sup> (yd <sup>3</sup> )	11.0 (14.4)	11.5 (15.0)	12.0 (15.7)

\*\* This body can not be supplied with exhaust-gas ducts

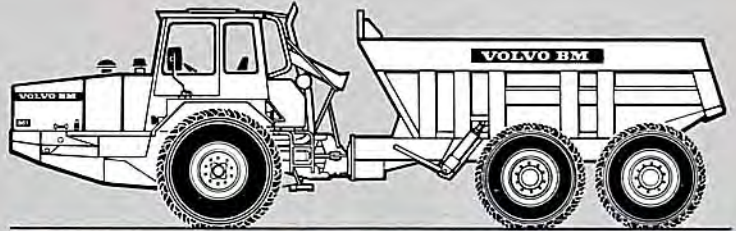
## Standard body equipped with wear plate and exhaust gas ducts

(weight increase 800 kg, 1764 lb)

The standard body equipped with wear plates should be used for forced loading of rock or other abrasive material. The wear plates extend machine life and reduce maintenance cost.

The sides and wear plates have a yield strength of 90 kgf/mm<sup>2</sup> and a hardness of 360–440 HB.

Ducts built into the floor of the body facilitate exhaust-gas heating if required.



Body volumes (SAE 2:1*)	Without tailboard	With underhung tailboard	With underhung/overhung tailboard
Body volume struck, m <sup>3</sup> (yd <sup>3</sup> )	8.7 (11.4)	9.0 (11.8)	9.3 (12.2)
heaped SAE, m <sup>3</sup> (yd <sup>3</sup> )	11.0 (14.4)	11.5 (15.0)	12.0 (15.7)

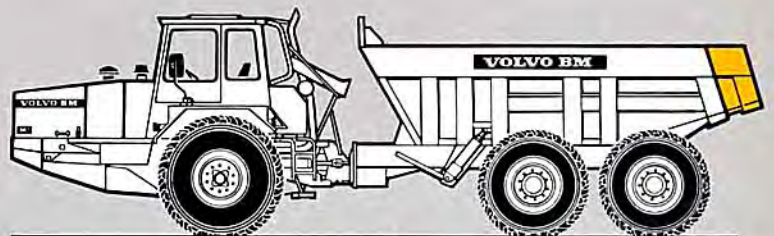
## Extended body with wear plates and exhaust-gas ducts

(weight increase 1100 kg, 2426 lb).

This is a 500 mm extension of the body. It makes tipping into mine shafts and crushers easier. The body extension partly replaces the tailboard. The body extension cannot be combined with the tailboard.

The extended body incorporates wear plates of the same high grade steel as the wear plates on the standard body, a yield strength of 90 kgf/mm<sup>2</sup> and a hardness of 360–440 HB.

Ducts built into the floor of the body facilitate exhaust-gas heating if required.



Body volumes SAE 2:1*	
extended, struck, m <sup>3</sup> (yd <sup>3</sup> )	9.8 (12.8)
heaped SAE, m <sup>3</sup> (yd <sup>3</sup> )	12.5 (16.4)

\* In the case of bodies with struck volumes of less than 10 m<sup>3</sup> (13 yd<sup>3</sup>), the volume shall be specified to the nearest 0.5 m<sup>3</sup>. In the case of bodies with struck volumes of 10 m<sup>3</sup> (13 yd<sup>3</sup>) or more, heaped volumes shall be specified to the nearest m<sup>3</sup>. Struck volume is given in m<sup>3</sup> (yd<sup>3</sup>) to one decimal place.

# STANDARD EQUIPMENT



## SAFETY AND COMFORT

- Impact-tested ROPS safety cab
- Heater with fresh air intake and defroster
- Adjustable, sprung driver's seat
- Windshield wipers
- Windshield washers
- Rear-view mirrors
- Sun visor
- Attachment points for safety belt
- Bally plates front unit
- Cigarette lighter and ashtray
- Horn
- Main headlights, bright/dim
- Reverse lights
- Direction indicators
- Cab lighting
- Indicator for air cleaner
- Complete tyre pumping unit
- Protective grille for rear window
- Hazard flashers
- Cab hatch
- Tool kit
- Brake lights
- Position lights



## INSTRUMENTATION

- Pilot lamp, extra lighting
- Pilot lamp, air cleaner
- Pilot lamp, charging
- Pilot lamp, direction indicators
- Pilot lamp, oil pressure, engine
- Pilot lamp, bright lights
- Pilot lamp, high and low gear
- Air pressure gauge
- Fuel gauge
- Pilot lamp, coolant temp.
- Pilot lamp, parking brake
- Pilot lamp, oil temperature, transmission
- Pilot lamp, oil pressure, transmission
- Revolution and hour counter gear

# EXTRA EQUIPMENT

(Standard equipment on certain markets)

- Cab ventilator
- Safety belt
- Compressor horn
- Rotating warning beacon
- Engine heater, electric
- Preheated intake air
- Heavy-duty air cleaner
- Narrow fenders for driving in confined spaces
- Protective plate for propeller shaft
- Radiator protection
- Tow hitch
- Body heater (exhaust gas)
- Underhung tailboard
- Overhung tailboard
- Headlight washer
- Headlight grilles
- Extra fuel filter
- Speedometer
- Radio
- Extended dumper body
- Wear plates for standard body and for body extension
- Oil bath air cleaner
- Towing equipment
- Electric emergency steering



## UNDERHUNG TAILBOARD

An underhung tailboard with operating mechanism which automatically opens the tailboard when the body is tipped. If the tailboard is subjected to excessively high load, a gas spring is released and the tailboard opens. When the load is relieved, the tailboard closes automatically.

A tailboard should always be used for road haulage in order to prevent spillage. The tailboard cannot be combined with a body extension.

The tailboard increases the weight of the body by 100 kg (220 lb).



## OVERHUNG TAILBOARD

On all machines equipped with an underhung tailboard, it is possible to mount an upper tailboard which, together with the lower tailboard, closes off the entire opening on the dumper body. This extra tailboard is intended to be used for hauling gravel, sand and fluid materials. The design of the tailboard does not permit rock, boulders and solid clay to be carried. For such haulage, the tailboard should be removed.

An overhung tailboard cannot be combined with a body extension.

The tailboard increases the weight of the body by 130 kg (287 lb).

# VOLVO BM

VOLVO BM AB ESKILSTUNA SWEDEN

*Under our policy of continual product improvement, we reserve the right to change specifications and design without notice. The illustrations do not necessarily show the standard version of the machine.*

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