

VOLVO BM 861



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
Type TD 60B

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 ³ (334 in ³)
Compression ratio	16:1
Cold start	Richer fuel mixture and thermostart
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 ²)
Turns of wheel between locks	3.5 turns
Steering angle from centreline	45°
Lock-to-lock steering time	~ 5.2 s at 25 r/s (1500 r/min)
Steering cylinder, 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, single-phase with free-wheeling starter and automatic lock-up stator.
Conversion ratio	2.3:1, with lock-up 1:1
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—32 km/h (0—19.8 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 ³ /s (34 US gal/min, 29 imp. gal/min)
Working pressure	12 MPa (1700 lb/in ²)
Ratio engine — hydraulic pump	1:0.8
Filter:	
Suction line	Strainer
Return line	Replaceable paper filter over magnetic core
Refill	Paper filter



AXLES

Tractor unit: integral part of transmission

Type: Volvo BM

Trailer (bogie) drive axle:	
Make	Volvo
Type	RAN 181
Differential lock	100% lock-up
Trailing axle:	
Journals, hub and brake	Mounted on tubular axle
Make	Volvo



TIPPING MECHANISM

Tipping cylinders, type	6-stage single-acting
Tipping angle	70°
Tipping time with load 45 r/s (2 700 r/min)	~ 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 ³ (13.7 in ³)
Drive	V-belt
Outlet for tyre pumping	Yes

Pressure regulator:	
Relief pressure, max.	0.75 MPa
Compressed air reservoir:	
Tractor unit	6+15 l (1.6+4.0 US gal, 1.3+3.3 imp. gal)
Trailer unit	6+15+20+20 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 welded channel sections.

Tractor unit, type
Trailer unit, type

Open channel sections
Welded box sections



VOLUMES

Engine oil, incl. filter

Approx. 17 dm³ (4.5 US gal,
3.7 Imp. gal)

Fuel tank

225 dm³ (59 US gal, 49 Imp. gal)

Cooling system

30 dm³ (8.0 US gal, 6.6 Imp. gal)

Hydraulic system

160 dm³ (42.3 US gal, 35 Imp. gal)

Hydraulic tank

135 dm³ (35.7 US gal, 29.6 Imp. gal)

Hydraulic transmission

22 dm³ (5.8 US gal, 4.8 Imp. gal)

Hydraulic transmission
at oil change

16 dm³ (4.8 US gal, 4.0 Imp. gal)
incl. oil filter

Differential — final

90 dm³ (23.7 US gal, 19.8 Imp. gal)

drive, tractor unit

Reduction gearbox

1.6 dm³ (0.42 US gal, 0.35 Imp. gal)

Differential and hub
reduction, trailer unit

28 dm³ (7.4 US gal, 6.2 Imp. gal)



CAB

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

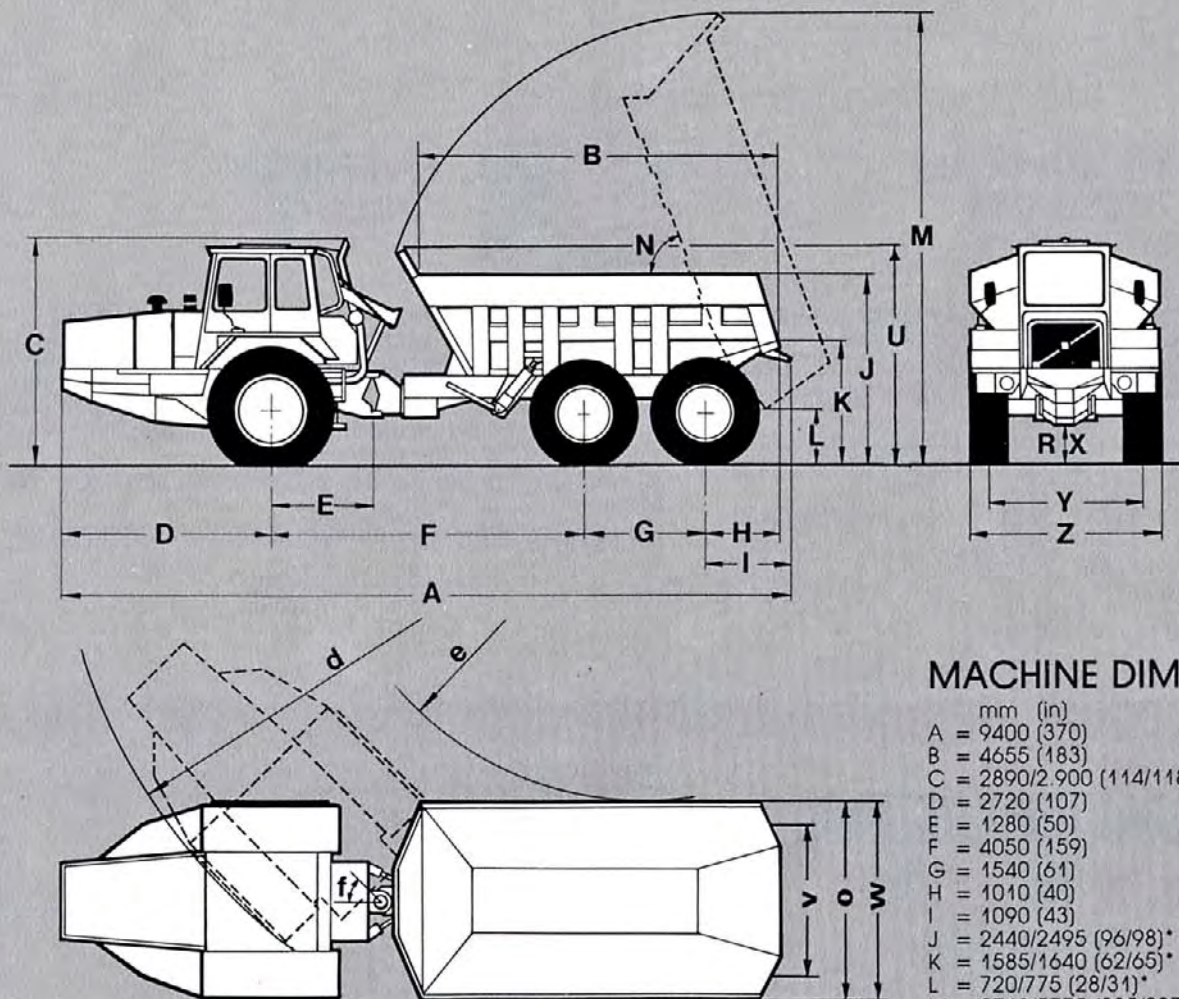
Heater and defroster: Heating element with fresh air heating and two-speed fan plus defroster.

Upholstery Flameproof

Points of attachment

for safety belt Yes

Number of exits 3 doors and cab hatch.



MACHINE DIMENSIONS 861

mm (in)	mm (in)
A = 9400 (370)	O = 2480 (89)
B = 4655 (183)	R = 395 (15.6)
C = 2890/2.900 (114/118)*	U = 2800 (110)
D = 2720 (107)	V = 1940 (76)
E = 1280 (50)	W = 2500 (98)
F = 4050 (159)	X = 420 (16.5)
G = 1540 (61)	Y = 1960 (77)
H = 1010 (40)	Z = 2500 (98)
I = 1090 (43)	d = 7500 (295)
J = 2440/2495 (96/98)*	e = 4100 (162)
K = 1585/1640 (62/65)*	f = 45°
L = 720/775 (28/31)*	
M = 5719/5775 (225/227)*	
N = 70°	

* = unladen machine
(tyres 18.00—25/20.5—25)



WEIGHTS

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

	Front axle	Bogie	Total weight
Unladen machine	7290 kg (16072 lb)	5890 kg (13000 lb)	13180 kg (29057 lb)
Machine with max. load, 18500 kg (40785 lb)	10500 kg (23150 lb)	21400 kg (47180 lb)	31900 kg (70325 lb)

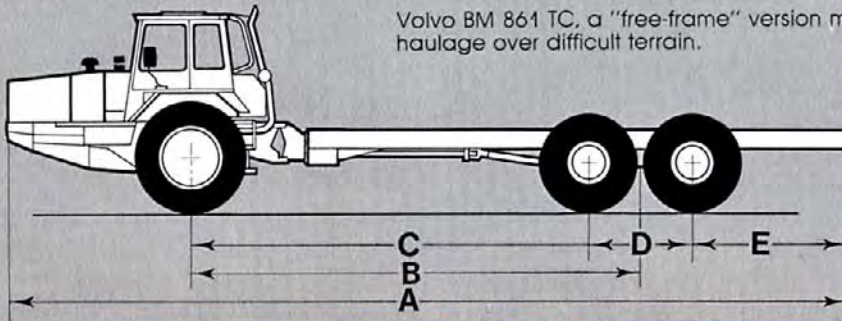


GROUND PRESSURE

Ground pressure at 15% slump of unladen diameter and 10 500 kg (23 500 lb) front axle load, 21 400 kg (47 180 lb), bogie load.

	kPa (lb/in ²)	Tyres	Unladen	Laden
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 (10.4)	109 (15.5)
Bogie	..	14.00–24 twin tyres	29 (4.1)	104 (14.8)

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)		
Frame length, trailer 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		
	Front	Rear	Total	Front	Rear	Total
Chassis weight*, kg (lb)	6840 (15080)	4260 (9390)	11100 (24470)	6740 (14860)	3860 (8510)	10600 (23370)
Load, incl. superstructure, kg (lb)	3660 (8070)	17140 (37790)	20800 (45860)	3760 (8290)	17540 (38670)	21300 (46960)
Total weight, kg (lb)	10500 (23150)	21400 (47180)	31900 (70325)	10500 (23150)	21400 (47180)	31900 (70325)

DIMENSIONS 861 TC, 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)	0 (0)

* Chassis weight includes: oil, fuel, water, tools and driver (70 kg, 154 lbs)

** With front-mounted hydraulic pump.



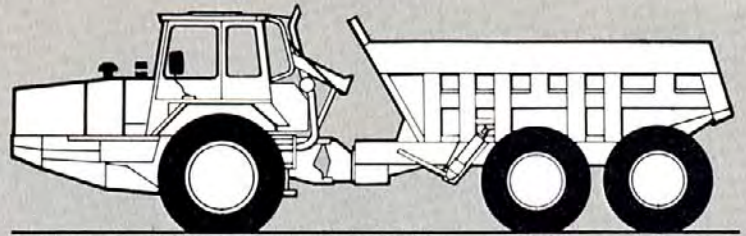
DUMPER BODIES

Standard body

The body is of a robust and heavy-duty design. In order to reduce weight and increase payload capacity, a hardened abrasion-resistant steel plate is used which possesses particularly high impact resistance even at low temperatures.

The sides of the body are externally reinforced and strengthened with pressed channel sections. The body is prepared for exhaust gas heating through ducts along the sides.

The body volume, payload capacity, body length and loading height of the 861 have been designed for efficient loading by all loaders and excavators on the market. The body volume is designed for a full load of ordinary, loosely-packed excavated materials.

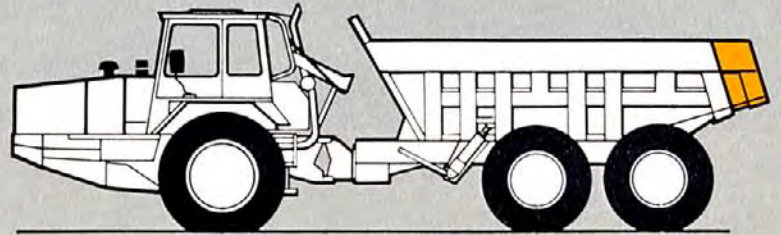


Body volumes (SAE 2:1*)	Without tailboard	With underhung tailboard	With underhung/overhung tailboard
Body volume, struck, m ³ (yd ³)	8.7 (11.4)	9.0 (11.8)	9.3 (12.2)
heaped SAE, m ³ (yd ³)	11.0 (14.4)	11.5 (15.0)	12.0 (15.7)

Standard body equipped with wear plates, weight increases 800 kg (1 764 lb). Standard body equipped with wear plates should be used for forced loading of rock materials or other abrasive material. The wear plates prevent the sidepanels from being dented and protect against wear.

Extended body (Weight increase 210 kg, 463 lb)

The body extension is 500 mm (20 in) long. It facilitates tipping in confined spaces, e.g. in mines. The body extension partly replaces the tailboard. The body extension cannot be combined with the tailboard.

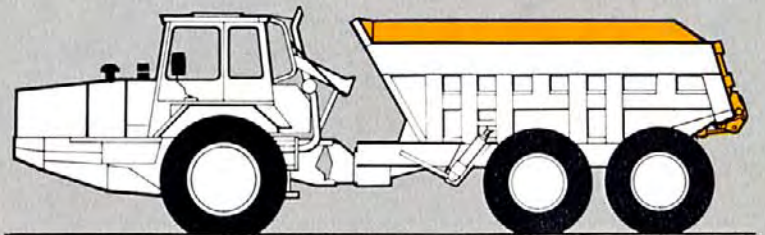


Body volumes SAE 2:1*	Without tailboard
extended, struck, m ³ (yd ³)	9.8 (12.8)
heaped SAE, m ³ (yd ³)	12.5 (16.4)

Extended body with wear plates, weight increase 1 080 kg (2 381 lb). An extended body with wear plates should be used for loading of rock or other abrasive materials. The wear plates are made of the same grade of steel as the wear plates on the standard body.

Elevated body (weight increase 270 kg, 595 lb)

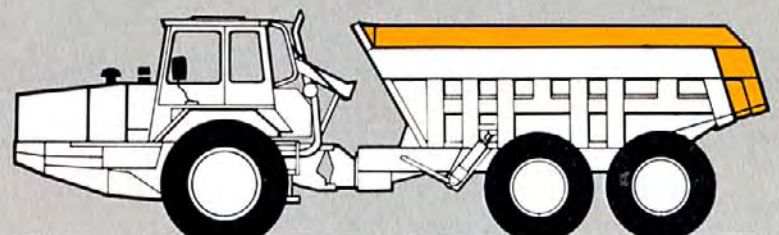
The elevated body is 275 mm (11 in) higher than the standard body and is suitable for light materials e.g. light sand. Body elevation alone is not recommended; it should be combined with body extension or overhung/underhung tailboard.



Body volumes (SAE 2:1*)	Without tailboard	With underhung tailboard	With underhung/overhung tailboard
Elevated, struck, m ³ (yd ³)	11.2 (14.6)	11.5 (15.0)	12.1 (15.8)
heaped SAE, m ³ (yd ³)	13.0 (17.0)	14.0 (18.3)	15.0 (19.6)

Extended and elevated body (weight increase 500 kg, 1 100 lb)

This body is suitable for hauling light materials, e.g. coal.



Body volumes (SAE 2:1*)	Without tailboard
Extended and elevated, struck, m ³ (yd ³)	12.6 (16.5)
heaped SAE, m ³ (yd ³)	15.0 (19.6)

* In the case of bodies with struck volumes of less than 10 m³ (13 yd³), the volume shall be specified to the nearest 0.5 m³.

In the case of bodies with struck volumes of 10 m³ (13 yd³) or more, heaped volumes shall be specified to the nearest m³.

Struck volume is given in m³ (yd³) to one decimal place.

STANDARD EQUIPMENT



SAFETY AND COMFORT

- Impact-tested 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
- 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



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
- Coolant thermostat
- Pilot lamp, parking brake
- Pilot lamp, oil temperature, transmission
- Pilot lamp, oil pressure, transmission
- Revolution and hour counter

EXTRA EQUIPMENT

- Cab ventilator
- Safety belt
- Compressor horn
- Rotating warning beacon
- Engine heater, electric
- Heavy-duty air cleaner
- Narrow fenders for off-road driving
- Protective plate for propeller shaft
- Collision protection
- Tow hitch
- Body heater (exhaust gas)
- Mechanical tailboard
- Overhung tailboard
- Headlight washer
- Headlight grilles
- Extra fuel filter
- Speedometer
- Radio
- Elevated dumper body
- Extended dumper body
- Wear plates for standard body and for body extension



MECHANICAL 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 a mechanical 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 stones and boulders 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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ENGELSKA

Production group for basic printed matter, VOLVO BM