

# Volvo BM A40

## 6×6



- **Engine output:**  
SAE J1349 Net  
295 kW (395 hp)
- **Body volume:**  
22 m<sup>3</sup> (28.7 yd<sup>3</sup>)
- **Load capacity:**  
36 t (40 sh tn)
  
- Direct-injected, turbo-charged, intercooled Volvo low emission diesel engine.
- Fully automatic powershift transmission. High and low gear ranges.
- Hydraulic retarder as standard.
- Fully enclosed, forced-oil-cooled multiple disc brakes with external cooling.
- One longitudinal and three transverse diff-locks. All with 100% lock-up.
- Front axle with three-point suspension and effective shock absorption
- Volvo BM terrain bogie, individually oscillating axles and high ground clearance.
- Low interior noise level.
- Adjustable steering wheel.

**VOLVO BM**

## ENGINE



Volvo 6-cylinder, inline, direct-injected, turbocharged, intercooled 4-cycle low emission diesel engine with overhead valves and wet replaceable cylinder linings.

Meets USA (EPA) and California off-road regulation 1996.

**Fan:** Hydrostatic driven, thermostatically controlled radiator fan consuming power only when needed.

Make Model			Volvo TD 122 KFE	
Max power at	r/s	(r/min)	35	(2100)
SAE J1349 Gross	kW	(hp)	297	(398)
Flywheel power at	r/s	(r/min)	35	(2100)
SAE J1349 Net	kW	(hp)	295	(395)
DIN 6271*	kW	(hp)	295	(395)
Max torque at	r/s	(r/min)	23	(1400)
SAE J1349 Gross	Nm	(lbf ft)	1675	(1235)
SAE J1349 Net	Nm	(lbf ft)	1665	(1228)
DIN 6271**	Nm	(lbf ft)	1665	(1228)
Displacement total	l	(in <sup>3</sup> )	12	(732)
Bore	mm	(in)	130	(5.13)
Stroke	mm	(in)	150	(5.9)
Compression ratio			15:1	

\*) with fan at normal speed. With fan operating at full speed, the flywheel power is 280 kW (375 hp) which corresponds to DIN 70020.

\*\*) with fan at normal speed. With fan operating at full speed, the maximum torque is 1510 Nm (1114 lbf ft) which corresponds to DIN 70020.

## ELECTRICAL SYSTEM



Voltage	V	24
Battery capacity	Ah	2x170
Alternator	W	1680
Starter motor	kW (hp)	6.6 (8.9)

## SERVICE REFILL CAPACITIES



Crankcase	l	(US gal)	39	(10.3)
Fuel tank	l	(US gal)	360	(95.0)
Cooling system	l	(US gal)	138	(36.4)
Transmission total	l	(US gal)	38	(10.0)
Dropbox	l	(US gal)	12	(3.2)
Hub	l	(US gal)	6	(1.6)
Front axle	l	(US gal)	40	(10.6)
First bogie axle	l	(US gal)	41	(10.8)
Second bogie axle	l	(US gal)	38	(10.0)
Brake cooling system	l	(US gal)	135	(35.7)
Brake cooling tank	l	(US gal)	100	(26.4)
Hydraulic system	l	(US gal)	260	(68.7)
Hydraulic tank	l	(US gal)	175	(46.2)

## DRIVETRAIN



**Torque converter:** Single stage with free wheeling stator and automatic lock-up in all ranges.

**Transmission:** Fully automatic planetary transmission with 6 gears forward and 2 in reverse.

**Dropbox:** Volvo BM with 2-stage design, power take-off and differential with lock-up function.

**Axles:** Volvo BM. 6-wheel drive. All axles have transversal diff-locks with 100% lock-up and fully floating axle shafts with planetary type hub reductions.

**Differential locks:** One longitudinal and three transverse. All with 100% lock-up.

Torque converter		2.08:1
Transmission	Volvo BM	PT 1760
Dropbox	Volvo BM	FL 802
Axles	Volvo BM	AHW 70

### Speeds with tyres 29.5 R 25

Low gear forward	1			
	2	km/h	(mile/h)	5.9 (3.7)
	3	km/h	(mile/h)	8.6 (5.3)
	4	km/h	(mile/h)	15.4 (9.6)
	5	km/h	(mile/h)	22.4 (13.9)
	6	km/h	(mile/h)	28.4 (17.6)
High gear forward	1			
	2	km/h	(mile/h)	8.3 (5.2)
	3	km/h	(mile/h)	12.0 (7.4)
	4	km/h	(mile/h)	21.6 (13.4)
	5	km/h	(mile/h)	31.2 (19.4)
	6	km/h	(mile/h)	39.7 (24.7)
Low gear reverse	1			
		km/h	(mile/h)	9.5 (5.9)
High gear reverse	1			
	2	km/h	(mile/h)	7.7 (4.8)
		km/h	(mile/h)	13.3 (8.3)

## SUSPENSION



### VOLVO BM SUSPENSION SYSTEM

**Front axle:** One rubber spring with bottoming absorption on each side. Stabilizer. Three shock absorbers on each side. The front axle is suspended at three points, which results in oscillation needed in rough terrain.

**Bogie:** Volvo BM's unique terrain bogie, which permits individual oscillation between the axles.



## BRAKE SYSTEM



Fully hydraulic brakes with enclosed, forced-oil-cooled multiple discs on all axles. Two circuits. Separate brake cooling for each axle. Comply with ISO 3450 and SAE J1473 at total machine weight.

**Circuit Division:** One for front axle and one for bogie axles.

**Parking brake:** Spring-applied, air-released disc brake on the propeller shaft, designed to hold a loaded machine on a grade up to 18%. When the parking brake is applied, the longitudinal differential is locked. Compressor: Gear-driven by engine transmission.

**Retarder:** Hydraulic, infinitely variable, integrated in transmission.

**For retarding capability incl. retarder, exhaust brake and engine, see graph on page 4.**

## HYDRAULIC SYSTEM



**Pumps:** Four engine-dependent, variable piston pumps mounted on flywheel power take-offs.

**Filtration:** Through two paper filters with magnetic cores.

Pump capacity per pump	l/min	(US gal/min)	110	(29.0)
at shaft speed	r/s	(r/min)	42	(2550)
Working pressure	MPa	(psi)	21	(3040)

## CAB



**Volvo BM cab**, tested and approved according to ROPS standard ISO/3471 and SAE J1040/APR 88. Mounted on rubber pads which effectively reduces vibrations. Adjustable steering wheel. Radio/Contronic console in ceiling.

**Heater and defroster:** Filtered air and pressurized cab.

**Operator's seat:** Flameproof upholstery. Extra seat for trainer.

Number of exits	2
Internal sound level acc. to ISO 6394 and at max. speed	dB (A) 76

## STEERING SYSTEM



Hydromechanical articulated steering. 3.4 lock-to-lock turns.

**Cylinders:** Two double-acting steering cylinders.

**Supplementary steering:** Complies with ISO 5010 at total machine weight.

**Steering angle:**  $\pm 45^\circ$

## BODY



**Body:** Hardened and tempered steel body with high impact strength.

**Cylinders:** Two single stage, double-acting.

Tipping angle	°	71
Tipping time with load	s	15
Lowering time	s	12
Body, plate thickness		
Sides	mm (in)	12 (0.47)
Bottom/chute	mm (in)	16 (0.63)
Headboard	mm (in)	8 (0.31)
Beams	mm (in)	10 (0.39)
Yield strength	N/mm <sup>2</sup> (psi)	1000 (145000)
Tensile strength	N/mm <sup>2</sup> (psi)	1250 (181000)
Hardness min.	HB	360-440

## WEIGHTS



Operating weight includes all fluids and operator. Standard machine.

### Operating weight:

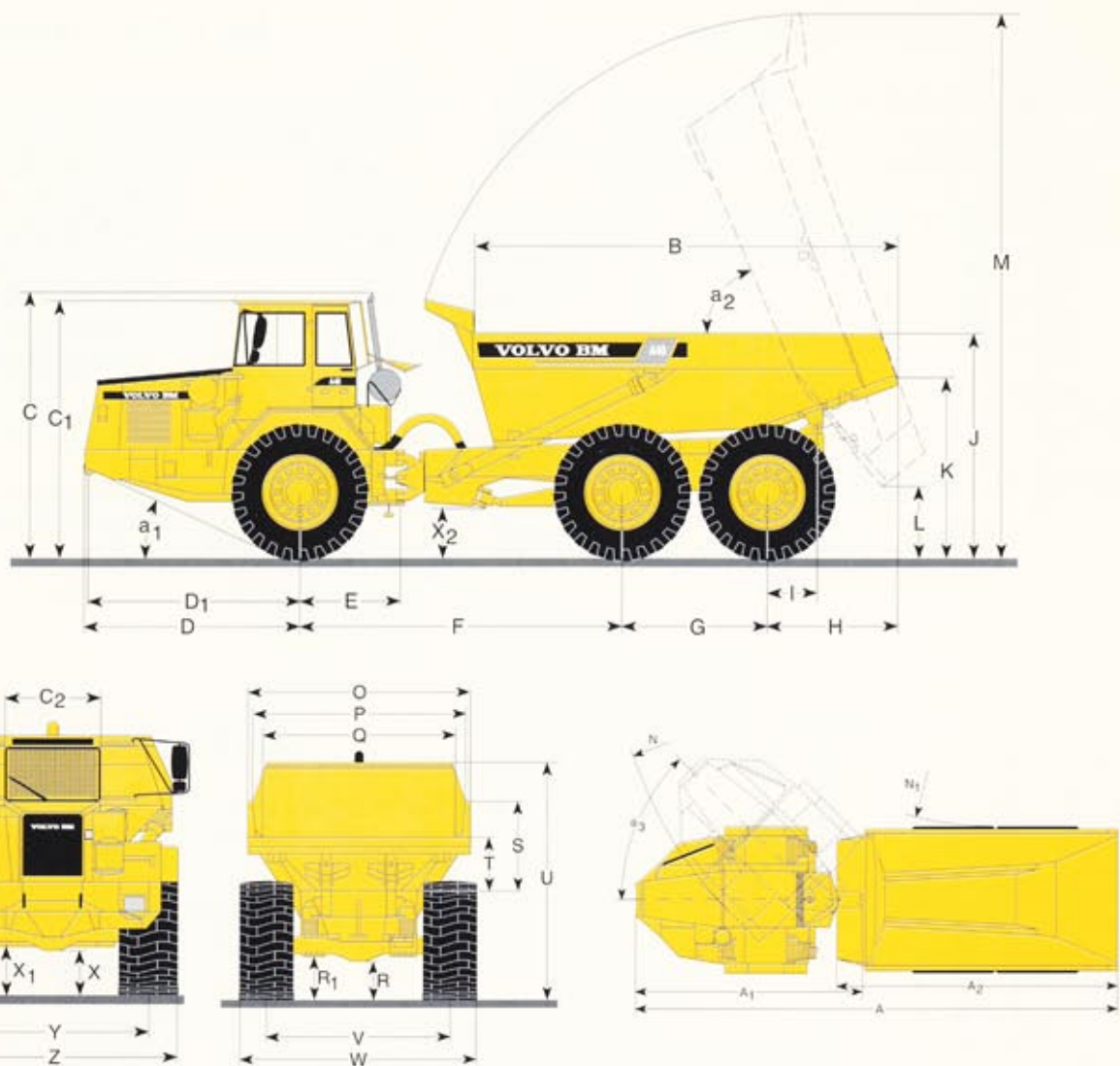
Front	kg (lb)	15200 (33520)
Rear	kg (lb)	14750 (32520)
Total	kg (lb)	29950 (66040)
Payload	kg (lb)	36000 (79380)
Total weight		
Front	kg (lb)	18100 (39910)
Rear	kg (lb)	47850 (105510)
Total	kg (lb)	65950 (145420)

## GROUND PRESSURE



At 15% sinkage of unloaded radius and specified weights.

Unloaded			
Front	kPa (psi)	106 (15.3)	
Rear	kPa (psi)	51 (7.4)	
Loaded			
Front	kPa (psi)	127 (18.4)	
Rear	kPa (psi)	168 (24.4)	



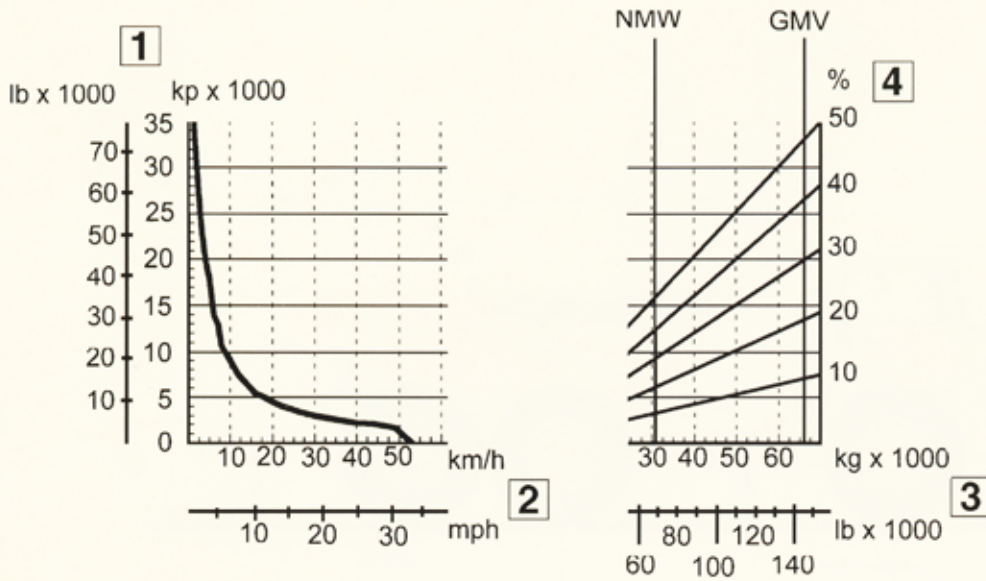
### DIMENSIONS Volvo BM A40 6x6 (unloaded with 29.5 R 25 tyres)

A	mm (ft in)	11135 (36'6")	F	mm (ft in)	4442 (14'7")	N <sub>1</sub>	mm (ft in)	4238 (13'11")	V	mm (ft in)	2636 (8'8")
A <sub>1</sub>	mm (ft in)	5246 (17'3")	G	mm (ft in)	1940 (6'4")	O	mm (ft in)	3290 (10'9")	W	mm (ft in)	3430 (11'3")
A <sub>2</sub>	mm (ft in)	6525 (21'5")	H	mm (ft in)	1793 (5'11")	P	mm (ft in)	3059 (10')	X	mm (ft in)	618 (2')
B	mm (ft in)	5738 (18'10")	I	mm (ft in)	643 (2'1")	Q	mm (ft in)	2853 (9'4")	X <sub>1</sub>	mm (ft in)	645 (2'1")
C	mm (ft in)	3701 (12'2")	J	mm (ft in)	643 (2'1")	R	mm (ft in)	657 (2'2")	X <sub>2</sub>	mm (ft in)	764 (2'6")
C <sub>1</sub>	mm (ft in)	3618 (11'10")	K	mm (ft in)	643 (2'1")	R <sub>1</sub>	mm (ft in)	754 (2'6")	Y	mm (ft in)	2636 (8'8")
C <sub>2</sub>	mm (ft in)	1331 (4'4")	L	mm (ft in)	3055 (10'1")	S	mm (ft in)	1379 (4'6")	Z	mm (ft in)	3430 (11'3")
D	mm (ft in)	2960 (9'9")	M	mm (ft in)	2510 (8'3")	T	mm (ft in)	834 (2'9")	a <sub>1</sub>	°	27
D <sub>1</sub>	mm (ft in)	2920 (9'7")	N	mm (ft in)	961 (3'2")	U	mm (ft in)	3498 (11'6")	a <sub>2</sub>	°	71
E	mm (ft in)	1270 (4'2")		mm (ft in)	7491 (24'6")				a <sub>3</sub>	°	45

### LOAD CAPACITY (Body volumes according to SAE 2:1)

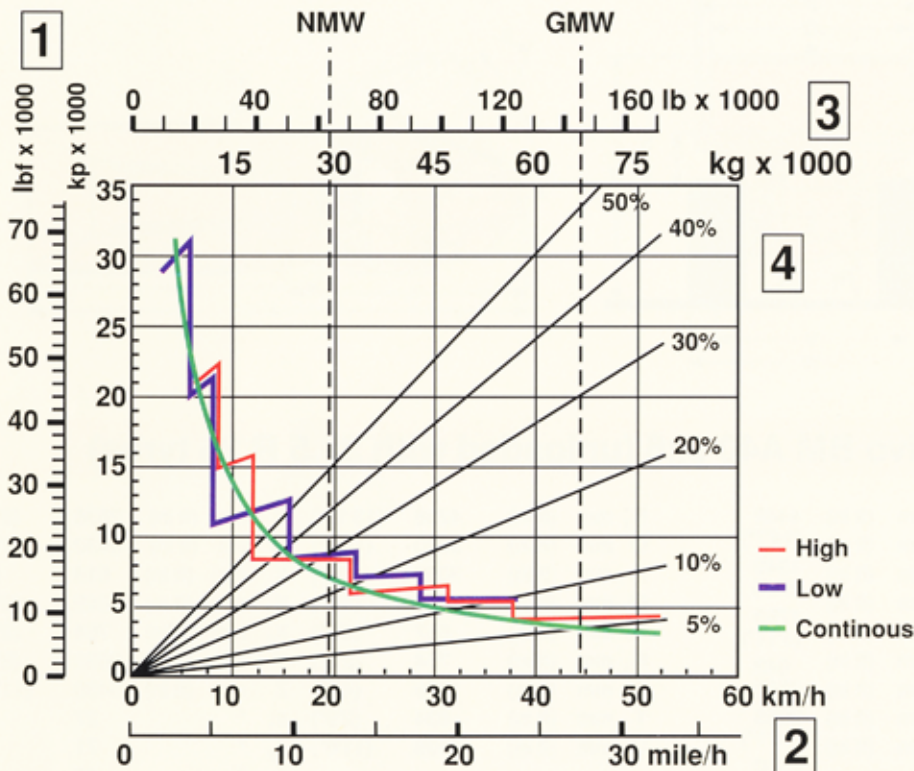
Load capacity	kg	(sh tn)	36000	(40)
Body, struck	m <sup>3</sup>	(yd <sup>3</sup> )	16.3	(21.3)
heaped	m <sup>3</sup>	(yd <sup>3</sup> )	22	(28.7)





#### RIMPULL

- 1 Rimpull in  $kp$  ( $lbf$ )
- 2 Speed in  $km/h$  ( $mile/h$ )
- 3 Machine weight in  $kg$  ( $lb$ )
- 4 Grade in % + rolling resistance in %.



#### RETARDATION PERFORMANCE

- 1 Braking effort in  $kp$  ( $lbf$ )
- 2 Speed in  $km/h$  ( $mile/h$ )
- 3 Machine weight in  $kg$  ( $lb$ )
- 4 Grade in % - rolling resistance in %

#### INSTRUCTIONS

Diagonal lines represent total resistance (grade % plus rolling resistance %).  
Charts based on 0% rolling resistance, standard tyres and gearing, unless otherwise stated.

In the retardation chart the diagonal lines represent the "total resistance" as well, which is the grade in % minus the rolling resistance in %.

- A. Find the diagonal line with the appropriate total resistance on the right-hand edge of the chart.
- B. Follow the diagonal line downward until it intersects the actual machine weight line, NMW or GMW.
- C. Draw a new line horizontally to the left from the point of intersection until the new line intersects the rimpull or retardation curve.
- D. Read down for vehicle speed.

## STANDARD EQUIPMENT

### Safety and comfort

ROPS cab  
 Cab heater with filtered fresh air and defroster.  
 Ergonomically designed and adjustable operator's seat  
 Windshield wipers  
 Windshield washers  
 Rear view mirrors  
 Sun-visor  
 Seat belt  
 Anti-slip material on hood and fenders  
 Cigarette lighter  
 Ashtray  
 Horn  
 Protective grille for rear window  
 Hazard flashers  
 Tinted glass  
 Lights:  
   headlights, main/dipped  
   parking lights  
   direction indicators  
   rear lights  
   back-up lights  
   brake lights  
   cab lighting  
   instrument lighting

Adjustable steering wheel  
 Steering joint locking assembly  
 Radio/Contronic console in ceiling  
 Speedometer  
 Secondary steering

### Engine and electrical system

Turbocharger  
 Oil drainage hose  
 Alternator  
 Preheating  
 Battery disconnect switch  
 Electrical outlet  
 Gauges for:  
   air pressure  
   engine temperature  
   engine revs  
   fuel  
   hours  
   transmission oil temperature  
 Pilot lamps for:  
   direction indicators  
   bogie axles diff-lock  
   front axle diff-lock  
   longitudinal diff-lock  
   lights  
   main beam  
   preheating  
   service brakes

Warning lamps for:  
   air filter  
   battery charging  
   body up  
   brake pressure  
   brake cooling,oil level  
   coolant level  
   dropbox oil level  
   engine oil pressure  
   engine temperature  
   engine-dependent pump  
   ground-dependent pump  
   parking brake  
   radiator fan  
   transmission temperature  
 Central warning for:  
   air filter  
   air pressure  
   battery charging  
   brake cooling,oil level  
   dropbox oil level  
   engine oil pressure  
   engine overspeed  
   engine temperature  
   steering function  
   transmission temperature

### Drivetrain

Torque converter  
 Automatic transmission  
 Drop box with high/low range  
 Automatic lock-up  
 Hydraulic, variable retarder  
 Longitudinal diff-lock  
 Differential lock front axle  
 Differential lock first bogie axle  
 Differential lock second bogie axle

### Body

Body with exhaust ducts

### Tyres

Front: 29.5R25  
 Rear: 29.5R25

## OPTIONAL EQUIPMENT

### Service and Maintenance

Tool kit with tyre inflation unit

### Engine

Oil-bath aircleaner

### Electrical

Work lights, roof-mounted  
 Rotating beacon

### Cab

Airsuspended, electrically heated operator's seat  
 Electrically heated rear-view mirrors  
 Air conditioning  
 Contronic display

### Protection

Overhead guards,FOPS  
 Mudguards on front of body

### Body

Extra front spillguard  
 Body heating  
 Overhung tailgate  
 Wear plates, kit delivery

*Under our policy of continual 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 Construction Equipment

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English  
 ART