

Volvo BM A20C

6×6



- **Engine output:**
SAE J1349 Net
170 kW (228 hp)
- **Body volume:**
12 m³ (15,7 yd³)
- **Load capacity:**
20 t (22 sh tn)
- *Direct-injected, turbo-charged, intercooled Volvo diesel engine.*
Low emission engine as option.
- *Fully automatic powershift transmission.*
- *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, in-line, direct-injected, turbocharged, intercooled 4-cycle diesel engine with overhead valves and wet replaceable cylinder linings.

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

Make	Volvo			
Model	TD 71 KF			
Max power at	r/s	(r/min)	40	(2400)
SAE J1349 Gross	kW	(hp)	173	(232)
Flywheel power at	r/s	(r/min)	40	(2400)
SAE J1349 Net, DIN 6271*	kW	(hp)	170	(228)
Max torque at	r/s	(r/min)	30	(1800)
SAE J1349 Gross	Nm	(lbf ft)	775	(570)
SAE J1349 Net, DIN 6271 **	Nm	(lbf ft)	765	(563)
Displacement total	l	(in ³)	6,73	(411)
Bore	mm	(in)	104,77	(4.1)
Stroke	mm	(in)	130	(5.1)
Compression ratio	15,5:1			

*) with fan at normal speed. With fan at full speed the flywheel power is 155 kW (208 hp) corresponding to DIN 70020.

**) with fan at normal speed. With fan at full speed the max torque is 685 Nm (504 lbf ft) corresponding to DIN 70020.

DRIVETRAIN



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

Transmission: Fully automatic planetary transmission with five gears forward and one in reverse.

Dropbox: Volvo BM single stage design with 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		2,43:1
Transmission		ZF 5 HP 500
Dropbox	Volvo BM	FL 650D
Axles	Volvo BM	AH 54

Speeds with tyres 20.5 R 25

Forward	1	km/h (miles/h)	9	(5.6)
	2	km/h (miles/h)	15	(9.3)
	3	km/h (miles/h)	25	(15.5)
	4	km/h (miles/h)	35	(21.7)
	5	km/h (miles/h)	47	(29.2)
Reverse	1	km/h (miles/h)	10	(6.2)

ELECTRICAL SYSTEM



Voltage	V	24		
Battery capacity	Ah	2x135		
Alternator	W	1680		
Starter motor	kW	(hp)	5	(6.7)

SERVICE REFILL CAPACITIES



Crankcase	l	(US gal)	24	(6.3)
Fuel tank	l	(US gal)	280	(74.0)
Cooling system	l	(US gal)	37	(9.8)
Transmission total	l	(US gal)	16	(4.2)
Dropbox	l	(US gal)	6	(1.6)
Hub	l	(US gal)	2,5	(0.7)
Front axle	l	(US gal)	29	(7.7)
First bogie axle	l	(US gal)	29	(7.7)
Second bogie axle	l	(US gal)	29	(7.7)
Brake hydraulics	l	(US gal)	4,0	(1.1)
Hydraulic system	l	(US gal)	160	(42.3)
Hydraulic tank	l	(US gal)	145	(38.3)

SUSPENSION



VOLVO BM SUSPENSION SYSTEM

Front axle: Two rubber spring with bottoming absorption on each side. Stabilizer. Two 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



Dual circuit system with air-hydraulic disc brakes. Comply with ISO 3450 and SAE J1473 at total machine weight.

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

Compressor: Gear-driven by engine transmission.

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.

Exhaust brake: Standard.

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

HYDRAULIC SYSTEM



Pumps: Three engine-dependent, variable piston pumps mounted on flywheel power take-offs. One unused power take-off available.

Ground-dependent hydraulic pump for supplementary steering mounted on the drop box.

Filtration: Filtration of oil through two paper filters with magnetic cores.

Pump capacity per pump at shaft speed	r/s	(r/min)	34	(2040)
engine dependent	l/min	(US gal/min)	100	(26.4)
ground dependent	l/min	(US gal/min)	118	(31.2)
Working pressure	MPa	(psi)	19,5	(2830)

CAB



Volvo BM cab, tested and approved according to ROPS standard ISO/ 3471 and SAE J1040/APR88. Mounted on rubber pads which effectively reduces vibrations. Adjustable steering wheel. Radio/ Contronic console in ceiling.

Heater and defroster: Filtered air and pressurized cab. Three speed fan.

Operator's seat: Flameproof upholstery. Extra seat for trainer as option.

Number of exits	2
Internal sound level, according to ISO 6394 and at max speed	dB (A) 78

STEERING SYSTEM



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

Cylinders: Two double-acting steering cylinders.

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

Steering angle: $\pm 45^\circ$

BODY



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

Cylinder: One single-acting 5-stage hoist cylinder with automatic tipping stop.

Tipping angle	°	63
Tipping time with load	s	15
Lowering time	s	15
Body, plate thickness		
Sides	mm (in)	10 (0.39)
Bottom/chute	mm (in)	10 (0.39)
Front	mm (in)	10 (0.39)
Yield strength	Nm/mm ² (psi)	1000 (145000)
Tensile strength	Nm/mm ² (psi)	1250 (181000)
Hardness min.	HB	360-440

WEIGHTS



Operating weight includes all fluids and operator.

Operating weight:

Front	kg (lb)	8700 (19180)
Rear	kg (lb)	7700 (16975)
Total	kg (lb)	16400 (36155)
Payload	kg (lb)	20000 (44092)
Total weight		
Front	kg (lb)	10900 (24030)
Rear	kg (lb)	25500 (56217)
Total	kg (lb)	36400 (80247)

GROUND PRESSURE

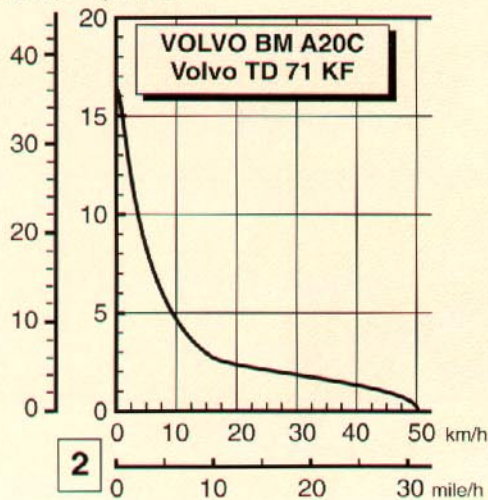


At 15% sinkage of unloaded radius and specified weights.

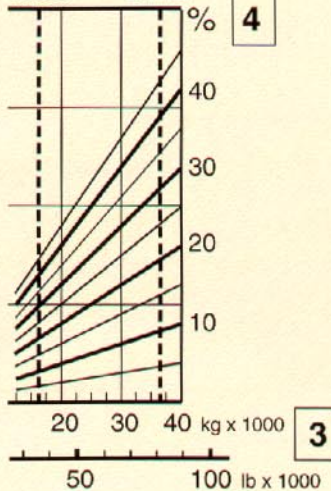
Unloaded			
Front	kPa (psi)	108 (15.7)	
Rear	kPa (psi)	48 (7.0)	
Loaded			
Front	kPa (psi)	135 (19.6)	
Rear	kPa (psi)	158 (22.9)	

1

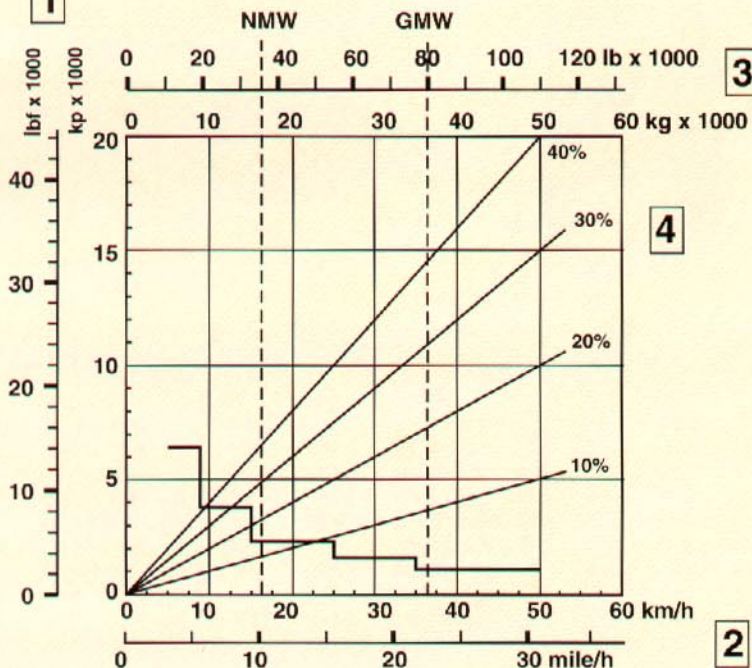
lbf x 1000 kp x 1000

**2**

NMW GWM

**4****3****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 %.

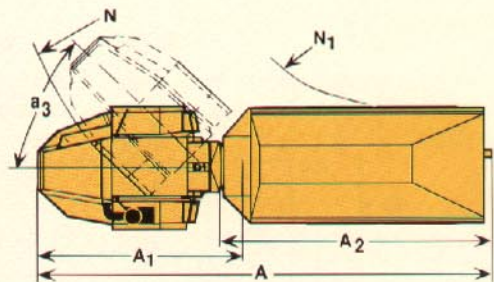
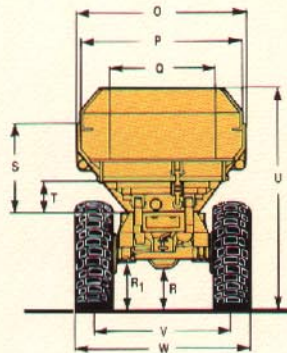
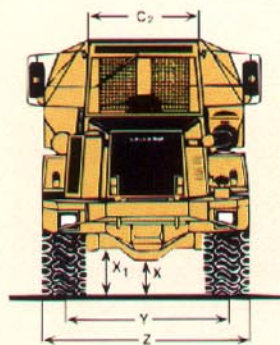
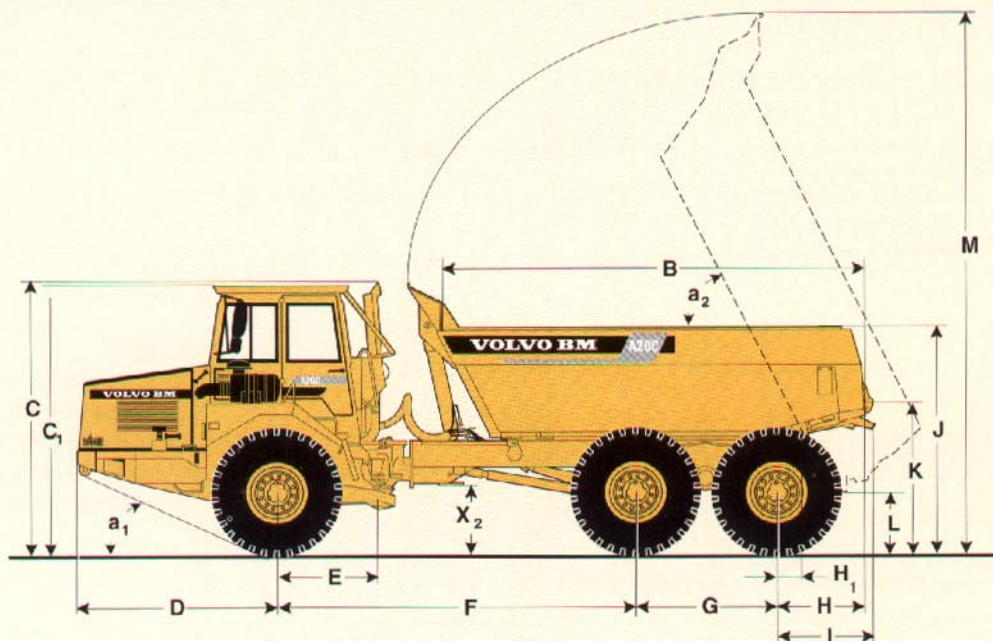
1**4****2****RETARDATION PERFORMANCE**

- 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 (here in downhill grades it is the total extra pushing force), 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 GWM.
- 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.



DIMENSIONS unloaded Volvo BM A20C 6x6 (20.5 R 25 tyres)

A	mm (ft in)	9505	(31'2")	F	mm (ft in)	4200	(13'9")	N ₁	mm (ft in)	4250	(13'11")	V	mm (ft in)	1930	(6'4")
A ₁	mm (ft in)	4495	(14'9")	G	mm (ft in)	1600	(5'3")	O	mm (ft in)	2480	(8'2")	W	mm (ft in)	2490	(8'2")
A ₂	mm (ft in)	5535	(18'7")	H	mm (ft in)	1115	(3'8")	P	mm (ft in)	2320	(7'7")	X	mm (ft in)	420	(1'5")
B	mm (ft in)	4955	(16'3")	H ₁	mm (ft in)	425	(1'5")	Q	mm (ft in)	1490	(4'11")	X ₁	mm (ft in)	550	(1'10")
C	mm (ft in)	3225	(10'7")	I	mm (ft in)	1290	(4'3")	R	mm (ft in)	460	(1'6")	X ₂	mm (ft in)	700	(2'4")
C ₁	mm (ft in)	3150	(10'4")	J	mm (ft in)	2600	(8'6")	R ₁	mm (ft in)	560	(1'10")	Y	mm (ft in)	1930	(6'4")
C ₂	mm (ft in)	1320	(4'4")	K	mm (ft in)	1675	(5'6")	S	mm (ft in)	1265	(4'2")	Z	mm (ft in)	2490	(8'2")
D	mm (ft in)	2415	(7'11")	L	mm (ft in)	600	(2')	T	mm (ft in)	380	(1'3")	a ₁	°	24.5	
E	mm (ft in)	1200	(3'11")	M	mm (ft in)	6040	(19'10")	U	mm (ft in)	3145	(10'4")	a ₂	°	63	
				N	mm (ft in)	7850	(25'9")					a ₃	°	45	

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

Load capacity	kg	(sh tn)	20000	(22)
Body, struck	m ³	(yd ³)	9,4	(12.3)
heaped	m ³	(yd ³)	12	(15.7)
With underhung tailgate				
Body, struck	m ³	(yd ³)	9,6	(12.5)
heaped	m ³	(yd ³)	12,5	(16.3)
With over and underhung tailgate				
Body, struck	m ³	(yd ³)	9,9	(12.9)
heaped	m ³	(yd ³)	13	(17.0)

STANDARD EQUIPMENT

Safety and comfort

ROPS cab
Cab heater with filtered fresh air and defroster
Ergonomically designed and adjustable operator's seat
Windshield wipers with interval
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 consol in ceiling
Speedometer
Secondary steering

Engine and electrical system

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

Warning lamps for:
 air filter
 battery charging
 body up
 brake pressure
 brake fluid level
 engine oil pressure
 engine overspeed
 engine-dependent steering pump
 ground-dependent steering pump
 hydraulic oil level
 parking brake
 transmission temperature
Central warning:
 air pressure
 battery charging
 brake fluid level
 engine oil pressure
 engine overspeed
 engine temperature
 hydraulic oil level
 steering function
 transmission temperature

Drivetrain

Torque converter
Automatic transmission
Drop box, single stage
Automatic lock-up
Longitudinal diff-lock
Differential lock front axle
Differential lock first bogie axle
Differential lock second bogie axle

Body

Body with exhaust ducts

Tyres

Front: 20.5R25
Rear: 20.5R25

OPTIONAL EQUIPMENT

Service and Maintenance

Tool kit with tyre inflation unit

Engine

Oil-bath aircleaner
Low emission engine, Volvo TD 71 KFE.
Meets EURO 1/ 88/77, Japan off-road regulation 1996, US Federal off-road regulation 1996 and California off-road regulation 1996, English off-road regulation 1993, EC ECE R24.3 and Swedish A30.

Max power at	r/s	(r/min)	40	(2400)
SAE J1349 Gross	kW	(hp)	173	(232)
Flywheel power at	r/s	(r/min)	40	(2400)
SAE J1349 Net, DIN 6271*	kW	(hp)	170	(228)
Max torque at	r/s	(r/min)	20	(1200)
SAE J1349 Gross	Nm	(lbf ft)	920	(677)
SAE J1349 Net, DIN 6271**	Nm	(lbf ft)	910	(670)
Displacement total	l	(in ³)	6,73	(411)
Bore	mm	(in)	104,77	(4.1)
Stroke	mm	(in)	130	(5.1)
Compression ratio			17,7:1	

*) with fan at normal speed. With fan at full speed the flywheel power is 155 kW (208 hp) corresponding to DIN 70020.

**) with fan at normal speed. With fan at full speed the max torque is 810 Nm (596 lbf ft) corresponding to DIN 70020.

Electrical

Head lights, left hand drive
Work lights, roof-mounted
Rotating beacon

Cab

Air conditioning
Airsuspended, electrically
 heated operator's seat
Contronic display
Electrically heated
 rear-view mirrors
Extra seat for trainer
Speedometer miles

Protection equipment

Brake protection, front axle
Mudguards on front of body
Overhead guard, FOPS

Body

Body heating
Overhung tailgate
Underhung tailgate
Wear plates, kit delivery

Other

Exhaust gas cleaning

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.

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