

# **VOLVO BM**

## **ROAD GRADER 312**



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**Powerful engine**

**Fast manoeuvring**

**High tractive effort**

VOLVO BM road graders are giving excellent service in many countries, under varying and difficult conditions. The machines have been gradually improved in order to meet steadily increasing demands for economical operation.

The 312 represents extremely high quality and excellent engineering design. The machine is of

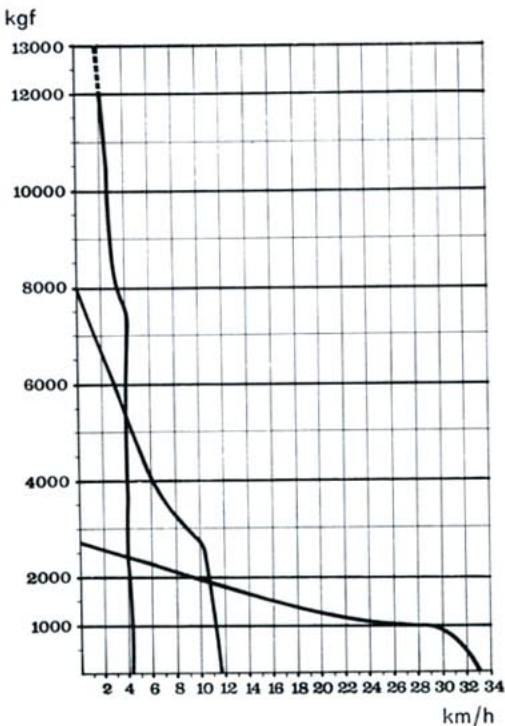
robust construction, with a fine balance between engine output and transmission, in order to attain a high tractive effort, speed and thus effectiveness. The work of the driver is comfortable and rational in the carefully designed cab, with easily operated and accurate controls, power-shift gearbox and a very high standard of seating comfort.



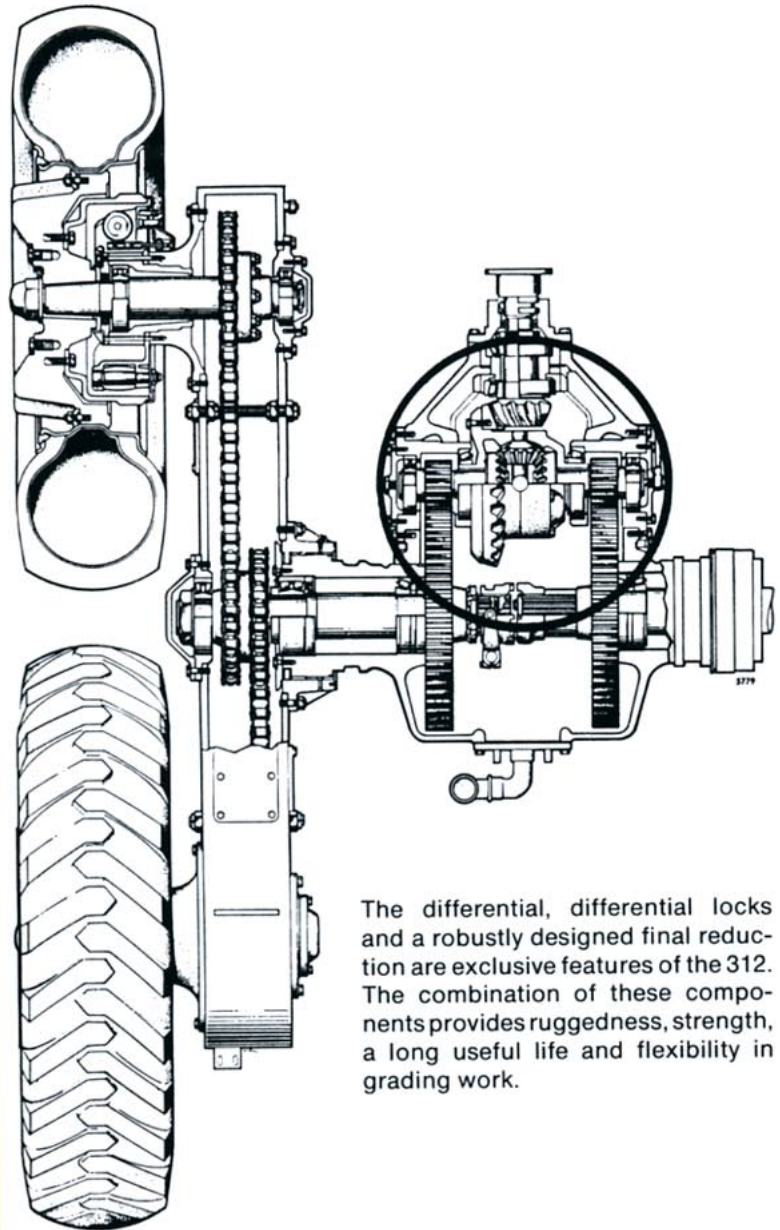


The 312 is equipped with the Volvo D 70 B, 6-cylinder, direct-injection diesel engine, large numbers of which are manufactured every year. The engine is robust and reliable, and develops a high torque over a wide range of speeds.

## Powerful engine High tractive effort



The graph shows the available tractive effort at various speeds. Note that at a speed of 2 km/h, the tractive effort is no less than 12 tons. It is also worth noting that the 312 has a practical speed range of approx. 2.5–10.5 km/h in second gear, this being the most common speed range for a road grader.



The differential, differential locks and a robustly designed final reduction are exclusive features of the 312. The combination of these components provides ruggedness, strength, a long useful life and flexibility in grading work.

## Fast and simple manoeuvring

The well-proven hydraulic transmission of the 312 is an important ingredient of the valuable characteristics of the machine. Full power-shift forward in three gear positions. High reversing speed of 33 km/h. Fast and simple manoeuvring for re-runs, e.g. during ditching in stony soil and during the finishing cut on fine adjustment.

# Robust Comfortable Flexible

## Robust front axle

The V-shaped front axle provides good ground clearance. Needle and roller bearings ensure a long useful life. Special design and induction hardening provide strength, safety and economy.

## Stable, safe frame

The frame of a VOLVO BM road grader is one of the components which has proved its reliability in tough service under a wide variety of conditions. The permissible deflection of the frame has been determined on the basis of empirical values, in order to allow for the best possible precision in work requiring close tolerances.



### Safety devices

The safety clutch for the swinging function of the grader blade safeguards against damage due to high shock loads. Owing to this feature and the easily replaceable wear parts, the service and idle-time costs are maintained at a minimum, in spite of ever-increasing demands on working speed and capacity.

### Cab comfort

The sound-insulated cab is mounted on rubber elements. Spring-loaded, adjustable driver's seat and hydraulic servo control combine to generate an exceptional sense of comfort. The ventilation and optional heating equipment provides a comfortable working temperature.

### Manoeuvrability

In spite of the robustness and weight of the machine, it is easy and convenient to manoeuvre. Mechanical manoeuvring with a hydraulic servo. No clutch pedal—only a gear selector. This increases the capacity of the driver and his job satisfaction.

### Small turning radius

Owing to the differential, the cambering gear of the front wheels and the well-balanced distance between the axles, the turning radius is no more than 30 ft (9 m). This modest radius has proved itself to be extremely valuable in a wide variety of duties, both in built-up areas and when carrying out work on twisting roads.



# Implements for a wide range of applications

A range of effective accessories and implements is available for VOLVO BM road graders, to increase their versatility, utilization and profitability.

Owing to its high tractive effort and robust design, the 312 can be equipped with a substantial **rearmounted ripper** for scarifying hard road surfaces, etc. The **dozer blade**—a well-proven item of equipment—has the piston rod of the lifting cylinder pointing upwards so that it will not be damaged when drawing material backwards, as often occurs on a construction grader. The dozer blade has robust side plates for effective retention of the material.

The **gravel windrow eliminator** is an indispensable implement for the maintenance of gravel roads. Fully hydraulic operation for setting the height and side displacements. One of the requirements in high-quality grading work is high accuracy of the finishing cut before surfacing. The range of accessories for VOLVO BM road graders therefore includes the well-proven, patented automatic control of the transverse grade (Grade precision Control). This equipment maintains the pitch angle of the blade at a predetermined value, with an accuracy of 0.1 %. The high accuracy thus attained, provides appreciable savings in surfacing materials when road building.



# TECHNICAL DATA FOR THE ROAD GRADER 312

## Weights

Service weight with rear-mounted scarifier and dozer blade	33000 lb (15000 kg)
Rear wheels	23100 lb (10500 kg)
Front wheels	9900 lb (4500 kg)
Service weight without scarifier and dozer blade	28900 lb (13100 kg)
Rear wheels	20300 lb (9200 kg)
Front wheels	8600 lb (3900 kg)
Service weight machine standard	27500 lb (12500 kg)
Rear wheels	19600 lb (8900 kg)
Front wheels	7900 lb (3600 kg)

The above weights are applicable with 1400-24 tyres without liquid ballast.

## Engine

Volvo direct-injection diesel engine	type D 70 B
Rating at 2400 rev/min	
SMMT, SAE, DIN	145, 160, 142 hp

## Gearbox

Epicyclic gearbox with hydraulically actuated multi-plate clutches, power-shift.

## Power transmission

Converter	
Torque conversion	2.5:1

## Speeds (at full output)

Gear	Forward	Reverse
1	0.5–4.2 km/h (0.3–2.6 miles/h)	0.3–2.7 miles/h (0.5–4.3 km/h)
2	2–11.6 km/h (1.2–7.2 miles/h)	1.2–7.5 miles/h (2–12 km/h)
3	7–33 km/h (4.4–20.5 miles/h)	4.4–20.5 miles/h (7–33 km/h)

## Steering

Mechanical steering with independent hydraulic servo  
Turning radius 29.5 ft (9 m)

## Tyres

Tyre sizes for front and rear wheels	
Standard	1400×24
Optional extra	1300×24
Optional extra	1600×24

## Brakes

Foot brake: Hydraulic with Hydro-vac vacuum servo, acting on 17 in×4 in brake drums on the leading pair of rear wheels.  
Handbrake: Mechanical

## Frame

Design: welded box section with internal reinforcement.  
Ground clearance to the underside of the frame 60 in (1540 mm)

## Circle

Diameter	58.5 in (1486 mm)
Mechanical rotation	unlimited
Teeth: case-hardened steel	

## Grader blade

Blade length	12 ft (3650 mm)
Blade height with cutting edge, cordal-dimension	22 in (560 mm)
Blade thickness	0.71 in (18 mm)
Cutting blades, two, dished	6 in×5/8 in×6 ft

The blade is reinforced by a welded box section with guides along the rear. The guides for hydraulic side displacement of the blade are provided with replaceable wear strips.

## Grader blade settings

Lift above ground at minimum blade pitch and with stand. tyres	20.5 in (520 mm)
Lateral shift of circle of blade	39.4 in (1000 mm)
Hydraulic lateral shift of blade	52.0 in (1320 mm)
Max. reach outside the wheels	95 in (2420 mm)
Max. slope angle	90°

## Driver's cab

Floor surface	52×27 in (1320×680 mm)
Height of floor above ground	44 in (1120 mm)
Inside height, floor to roof	75 in (1900 mm)

## Liquid capacities

Fuel tank	48.4 Imp.gal (220 l)
Cooling system	6.6 Imp.gal (30 l)
Crankcase	22 pt (12.5 l)
Gearbox	109 pt (62 l)
Tandem transmissions, each	44 pt (25 l)
Hydraulic system	79 pt (45 l)

## Electrical system

Voltage	24 V
Alternator	800 W

## Windscreen wipers

Electrically powered.  
Number of wipers 3

## OPTIONAL EQUIPMENT

### Scarifier

Weight	1320 lb (600 kg)
Shape	Vee
Effective width	49 in (1235 mm)
Number of teeth	11
Tooth dimensions	3×1 in (75×25 mm)
Tooth pitch	4.7 in (120 mm)
Distance from scarifier to front axle	29 in (735 mm)
Max. cutting depth	8.5 in (215 mm)
Max. scarifier load	8820 lb (4000 kg)

### Dozer blade

(hydraulically controlled)	
Weight	1980 lb (900 kg)
Width	96 in (2240 mm)
Height	32 in (810 mm)
Thickness	0.47 in (12 mm)
Max. lift above ground	18 in (470 mm)
Max. cutting depth	7.5 in (190 mm)

### Gravel windrow eliminator

Weight	1145 lb (520 kg)
Effective width, max.	104.5 in (2654 mm)
Distance from outermost tyre to outer edge of wing	22–25 in (560–630 mm)
Roading width: Windrow eliminator blade retractable within the overall width of the grader.	
Lift height	18–19 in (450–485 mm)
Draft below ground level	6.5–7.9 in (165–200 mm)
Attack angle of cutting edge	90°–110°
Angular setting of the cutting edge in relation to the grader	25°–30°

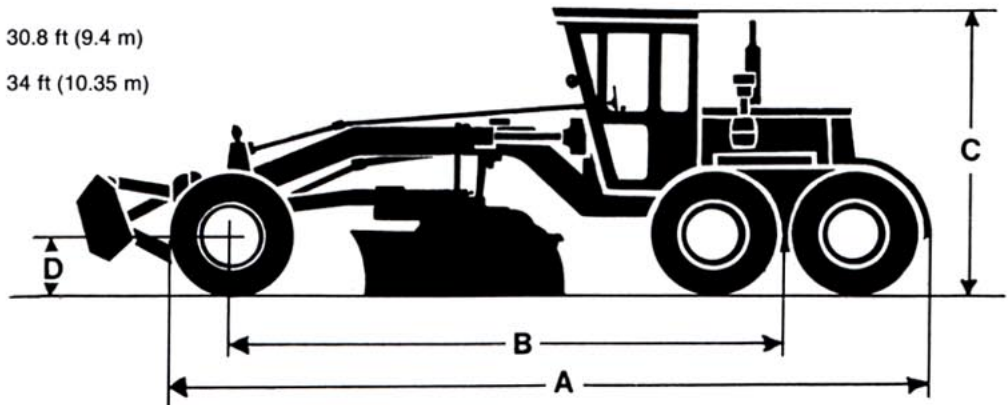
### Rear-mounted ripper

Weight	2300 lb (1040 kg)
Effective width	83 in (2100 mm)
Total width	95 in (2400 mm)
Working depth	13.8 in (350 mm)
Number of ripper teeth	5
Number of small scarifier teeth as optional extra	11

The specifications are subject to change without prior notice.

Total length with dozer blade	30.8 ft (9.4 m)
Total length with dozer blade and Ripper	34 ft (10.35 m)

- A 315 in (8000 mm)
- B 224 in (5700 mm)
- C 118 in (3000 mm)
- D 24.8 in (630 mm)



# VOLVO BM

## ROAD GRADER 312

The VOLVO BM road grader 312 is designed on the basis of the company's fifty years of experience in the production of roadmaking machinery. It has been designed for tough service for extended periods, to provide the best possible operating economy, reliability and capacity. Carefully selected materials, experienced personnel, modern and rational manufacturing methods and extreme-

ly thorough quality control are characteristic features in the manufacture of VOLVO BM road graders. In addition, the road graders reflect the advantages accruing from the resources of a large company, in the form of high-volume production and development work which takes into account a wide spectrum of experience and technical advances.



Comfortable, sprung driver's seat.



The wear parts of the grader blade are readily replaceable. The illustration shows the version of the grader blade with hydraulic setting of the blade pitch (optional extra).



Safety clutch for the swinging function of the grader blade.

# VOLVO BM

VOLVO BM ESKILSTUNA SWEDEN

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