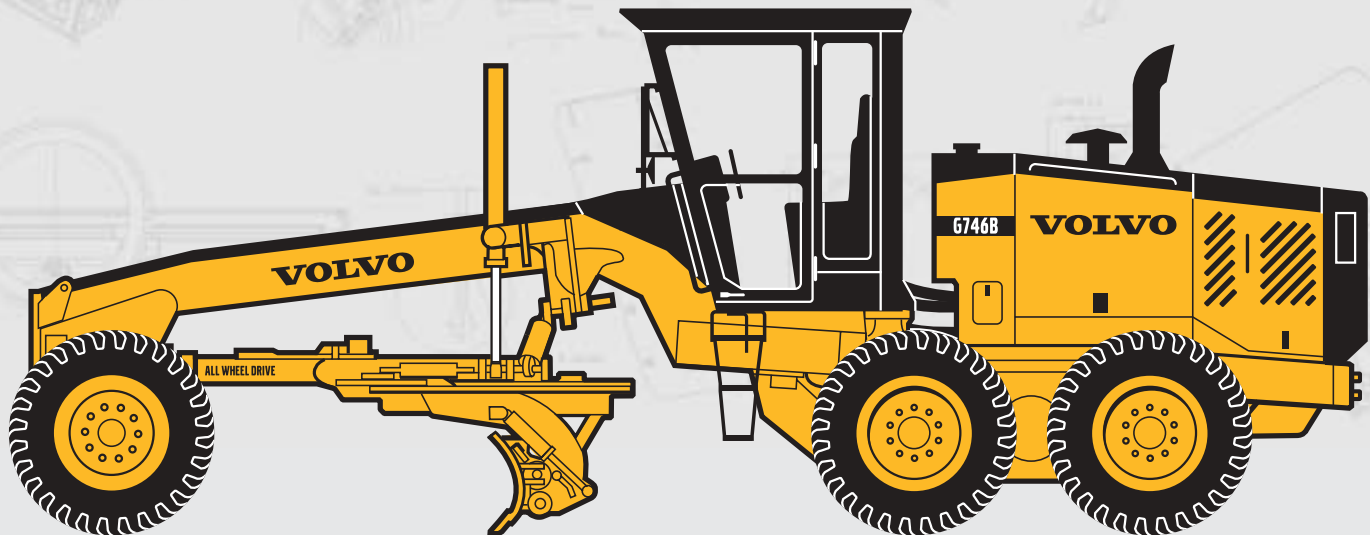


VOLVO MOTOR GRADER G746B

ALL WHEEL DRIVE



- **Configuration:** Articulated frame
- **Engine model:** Volvo D10BGAE2
- **Maximum net engine output @2100 RPM (per SAE J1349):** 219 - 243 hp (163 - 181 kW)
- **Base weight:** 38,250 lb (17 350 kg)
- **Blade down force:** 20,308 lb (9 212 kg)
- **Blade pull:**
All Wheel Drive – 32,598 lb (14 786 kg)
Tandem – 24,098 lb (10 931 kg)
- 8400 fully sequential direct drive powershift transmission
- Choice of fully enclosed, ROPS cab in full height or low profile configuration, or ROPS canopy
- Moveable Blade Control System
- Load sensing, Closed Center Hydraulic System
- Fully adjustable control pedestal with low effort hydraulic controls
- Full front and rear frame sections designed for attachment mounting
- Engine cooling module with efficient, variable speed, hydraulically driven cooling fan
- Single lever “Smart Shifter” transmission control with gear memory feature
- Separate hydraulic pump & speed sensor for each front wheel motor
- Variable aggression for job matching
- Maintains aggression at both front wheels through turns
- Creep feature allows hydrostatic drive at front wheels from 0-2.0 mph (0-3,2 km/h) for optimum fine grading
- Wheel motor efficiencies maintained in both forward and reverse
- AWD available at speeds up to 19.5 mph (31,4 km/h)
- Equipped with the fuel efficient, long life Volvo engine that complies to the EPA Tier II, EU Stage II emission standards

VOLVO



Operating weight (Standard equipment)

Weights shown include full cab with ROPS, all operating fluids and operator.

Base

Total 38,250 lb (17 350 kg)
On front wheels 11,475 lb (5 205 kg)
On rear wheels 26,775 lb (12 145 kg)

Typically equipped operating weight:

includes 17.5 x 25, 12 PR, G-2 tires on 14" (356 mm) rims and 14" x 29" x 1" (4 267 x 737 x 25 mm) moldboard and scarifier.

G746B 40,688 lb (18 456 kg)

Maximum combined capacity 50,800 lb (23 043 kg)

Maximum weight - front 16,700 lb (7 575 kg)

Maximum weight - rear 34,100 lb (15 468 kg)

Weight adjustments for various options are listed at the rear of the brochure.

Note that adding weight and attachments to the base grader may necessitate a tire upgrade since the maximum weight capacity of the tire may be exceeded.



Productivity (Standard equipment)

Blade pull at base weight (no wheel slip, 0.9 traction co-efficient) 32,598 lb (14 786 kg)

Tandem-Maximum blade pull (no wheel slip, 0.9 traction co-efficient) tandem only 24,098 lb (10 931 kg)

Blade down force

• cutting capability (ISO 7134) 20,308 lb (9 212 kg)

Blade down pressure is the maximum downward force which may be applied at the cutting edge.



Engine data

G746B

Make/Model Volvo D10BGAE2

Type 4 Cycle, Turbocharged, Aftercooled

No. of cylinders In Line 6

Bore & stroke 4.76" x 5.51" (121 x 140 mm)

Displacement 586 cu in (9,6 l)

Maximum net engine output @ 2100 RPM

(per SAE J1349) 219-243 hp (163-181 kW)

Rated gross brake horsepower @ 2100 RPM

• Gears forward 1, 2 and

Reverse 1 225 hp (168 kW)

• Gears forward 3-8 and

Reverse 2-4 249 hp (186 kW)

Rated net brake horsepower @ 2100 RPM

• Gears forward 1, 2 and

Reverse 1 219 hp (163 kW)

Torque @ 1000 RPM 837 lb.ft (1 135 N.m)

Torque rise 46.7%

• Gears forward 3-8 and

Reverse 2-4 243 hp (181 kW)

Torque @ 1100 RPM 846 lb.ft (1 145 N.m)

Torque rise 33.8%

All Wheel Drive engaged

Rated gross brake horsepower @ 2100 RPM

• All gears 249 hp (186 kW)

Rated net brake horsepower @ 2100 RPM

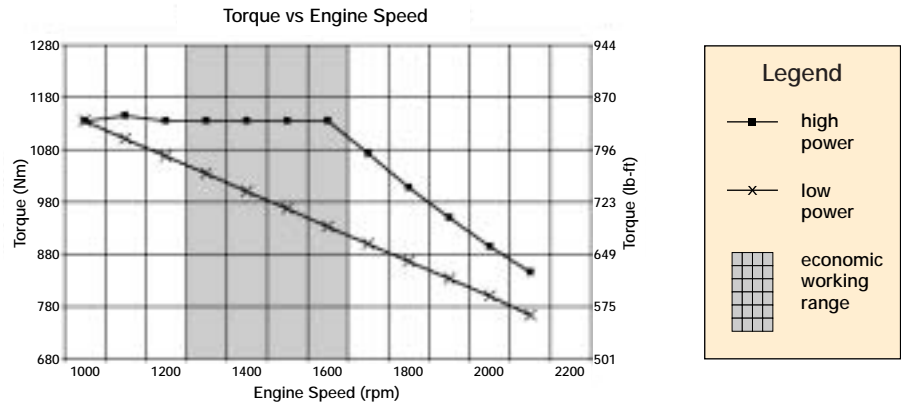
• All gears 243 hp (181 kW)

Torque @ 1100 RPM 846 lb.ft (1 145 N.m)

Torque rise 33.8%

Performance: Rated net brake horsepower SAE standard J1349/ISO 3046-2 conditions with water pump, lubricating oil pump, fuel system, air cleaner, muffler, alternator and cooling fan.

Engine performance curve



Engine data (continued)

Engine complies to EPA Tier II, EU Stage II exhaust emission standard.

Engine cooling system designed with singular cooler installations, and utilizes a highly efficient, variable speed, hydraulically driven cooling fan.

Engine equipped with a two stage, dual element, dry type air cleaner with exhaust aspirator and service indicator. 24 volt starting and electrical system with 80 amp (1920 watt) brushless alternator with internal voltage regulator. Two heavy duty 12 volt maintenance free batteries with 950 cold cranking amps (CCA) and 160 minutes reserve capacity per battery. 1300 CCA batteries available. System includes battery disconnect.



Transmission

Make/Model Volvo 8400

Fully sequential, direct drive, powershift transmission. Engine cannot be started if transmission is in gear. Single lever "Smart Shifter" electronic transmission controller provides self-diagnostics. The flywheel mounted, multi-disc master clutch is oil cooled and lubricated for long life.

Ground speeds at 2100 RPM with standard tires:

Forward		Reverse	
Gears.....mph.....km/h		Gears.....mph.....km/h	
1.....2.6.....4,2		1.....2.6.....4,2	
2.....3.7.....5,9			
3.....5.1.....8,2		2.....5.1.....8,2	
4.....7.1.....11,4			
5.....10.1.....16,1		3.....10.1.....16,1	
6.....14.1.....22,7			
7.....19.5.....31,4		4.....19.5.....31,4	
8.....27.2.....43,8			

Transmission guard is standard equipment and is hinged for easy access.

Perma Lube U joints on the input/output drive shafts.



Differential / Final drive

Make/Model Volvo SR40

Single reduction final drive with an operator controlled lock/unlock differential. Rear axles are induction hardened, supported on double row spherical roller bearings.



Tandems

Robotically welded, tandem case with internal gusseting for maximum torsional strength. Field proven split ring/flanged sleeve tandem mounting and 1" (25 mm) thick inner wall resists flexing from side loading during severe applications.

Depth 24.50" (622 mm)

Width 8.25" (210 mm)

Thickness • inner wall 1.00" (25 mm)

• outer wall 0.75" (19 mm)

Center distance 61.50" (1 562 mm)

Drive chain pitch 2.00" (51 mm)

Oscillation ±15°



Brakes

Service Brakes: Foot operated


Fade resistant, hydraulically actuated, wet multiple disc service brakes located at the 4 tandem drive wheels are self-adjusting, fully sealed and maintenance free. System features crossover dual braking circuits for uniform braking on both sides of the grader. Includes reserve power assist and operator warning system (visual and audible).

Parking Brake

Spring applied hydraulic release independent, disc type parking brake on transmission output shaft and effective on all 4 tandem drive wheels. Includes visual and audible operator warning system for parking brake on, transmission in gear condition. Transmission will not engage with park brake on.

Braking systems comply to SAE Recommended Practice J1473 OCT. 90, and J1152 APR. 80; ISO 3450-1993-01-28. Volvo uses asbestos free brake components.



 **Wheels & tires
(Standard equipment)**

Tire size 14.00 x 24, G-2
 Ply rating (PR) 12
 Rim size 10.0" (254 mm) Three piece rim
 Bolt-on rims are not interchangeable between front and rear. One piece rim available.

 **Front axle**

Type: Robotically welded steel truss, gusseted for torsional strength, oscillates on a single 3.15" (80 mm) diameter center pivot pin.
 Wheel lean 18° R & L
 Oscillation 16° up and down
 Ground clearance 24.0" (610 mm)
 Two 3" (76 mm) diameter wheel lean cylinders with lock valve are standard equipment.

 **All Wheel Drive**

The Volvo high torque All Wheel Drive System incorporates two variable displacement, closed loop piston pumps. The Volvo AWD design automatically adjusts hydraulic flow and pressure to the drive system to match tandem wheel speeds in all tractive conditions. Each front wheel is independently powered by a 2 speed motor. Each motor is controlled by its own speed sensor and pump. The All Wheel Drive System is controlled by the operator through a positive On/Off switch as well as a

 **All Wheel Drive
(continued)**

16 position variable aggression dial. The front wheel speed sensors will always match front wheel speed to tandem wheels speed relative to the level of aggression selected by the operator. This provides optimum job matching in all tractive conditions. When AWD is selected, the engine will deliver maximum VHP horsepower regardless of the working gear being used.

Typical operating pressure 3,000 psi (206 Bar)
 Maximum operating pressure 5,000 psi (344 Bar)
 Minimum operating pressure 500 psi (34 Bar)
 Top speed 19.5 mph (31.4 km/h)
 Creep Mode speed 0-2 mph (0-3.2 km/h)
 Maximum rim pull 8,500 lb (3 856 kg)

The Volvo high torque All Wheel Drive System operates in forward gears 1-7 and reverse gears 1-4. The operator may shift from 7th AWD into 8th and back to 7th AWD at any time for maximum high speed performance.

In addition, the Volvo system provides the operator with the ability to fine grade in Creep Mode using only hydrostatic front wheel drive.

The Volvo high torque All Wheel Drive System offers infinite speed control below 2 mph (3,2 km/h) for fine grading as well as a top speed of 19.5 mph (31,4 km/h) for snow plowing.

The AWD controller is integral with the electronic 8400 transmission controller, thereby supplying the same diagnostic features found in the Volvo 8400 transmission.

 **All Wheel Drive
(continued)**

Volvo AWD motors maintain maximum efficiency in both forward and reverse.

Operating modes

All Wheel Drive or Tandem Drive

- On-Off Selection
- Creep Mode - Hydrostatic front wheel drive only for optimum control and maneuverability while fine grading.
- Manual Mode - Allows the operator to match front wheel aggression setting to specific applications.

AWD features

- Maximum startup torque
- Power maintained in either direction
- Smooth operation at all speeds
- Maintains front wheel aggression in turns
- One speed sensor at each front wheel
- Hydrostatic Creep Mode feature



Steering

Hydrostatic power steering of front wheels incorporating two steering cylinders. Meets SAE J1511 OCT. 90 with optional secondary steering.

Minimum turning radius using front axle steering, articulation, wheel lean and unlocked differential 25'7" (**7 798 mm**)

Steering arc 72°

Frame articulation angle 22°

Articulation lock standard.



Frame

Full front and rear frame sections.

Front: Robotically welded box section. Dual sloped front frame provides excellent forward visibility.

Minimum dimensions of

box section 10.5" x 14.0" (**267 x 356 mm**)

Plate thickness

• top and bottom 1.25" (**32 mm**)

• sides 1.00" (**25 mm**)

Vertical section modulus

at arch 163 cu in (**2 676 cm³**)

minimum 137.7 cu in (**2 256 cm³**)

maximum 283.9 cu in (**4 652 cm³**)

Linear weight - minimum-maximum 148.7 - 244.2 lb/ft (**221.3 - 363.4 kg/m**)

Rear: Full perimeter rear frame permits modular powertrain mounting for ease of service and is ideal for attachment mounting. Optional first user lifetime warranty on frame and articulation joint.

Minimum dimensions of

rear frame 4.0" x 11.0" (**102 x 279 mm**)

Plate thickness 1.0" (**25 mm**)



Articulation

Twin 5" (**127 mm**) hydraulic cylinders articulate frame 22° right and left. Anti-drift lock valve ensures stable operation.



Circle

Hardened teeth, cut on the outside of the circle for maximum leverage and minimum wear.

Circle to drawbar support is provided at 9 points. Three upper circle wear plates, three adjustable clamp plates and three adjustable guide shoes combine to ensure optimum circle support and load distribution. DURAMIDE™ wear plates and bearings at the clamp and guide shoes prevent metal-to-metal contact and provide maximum service life.

DURAMIDE™ is a synthetic bearing material that provides long service life and reduces circle system maintenance requirements.

Diameter 66.25" (**1 683 mm**)

Thickness 1.25" (**32 mm**)

Adjustable guide shoes 3

Adjustable clamp plates 3

Upper circle wear plates 3



Circle drive

The Volvo dual cylinder Circle Drive System uses direct acting hydraulic power for exceptional turning and holding capability under full load. Circle Drive System uses hardened drive pinions and is protected against impact damage by an overload relief valve as standard equipment.

Hydraulic drive cylinders 2

Points of leverage 2

Rotation 360°



Drawbar

Fully welded box section. Narrow "T" design permits optimum visibility to the work area. Drawbar ball stud provides an adjustment to compensate for different tire sizes. Blade lift cylinder anchors are straddle mounted on drawbar to provide maximum strength and support.

Dimensions of

box section 6.5" x 6.5" (**165 x 165 mm**)

Plate thickness 1.0" & 0.75" (**25 & 19 mm**)



Moldboard

Standard moldboard with

replaceable end bits 12' x 29" x 1" (**3 658 x 737 x 25 mm**)

Blade material SAE 1050 high carbon steel

Edge through hardened. 6" x 5/8" boron steel

(**152 x 16 mm**)

Bolt spacing 6" (**152 mm**)

• bolt size 5/8" (**16 mm**)

Slide rails supported by DURAMIDE™

bearings.



Blade range: Moveable Blade Control System

(Dimensions shown with standard moldboard)

LEFT RIGHT

Reach outside tires - articulated

frame 120.0" (**3 048 mm**) 119.5" (**3 035 mm**)

Reach outside tires - straight

frame 79.5" (**2 019 mm**) 79" (**2 007 mm**)

Blade slide 26.5" (**673 mm**) 26.5" (**673 mm**)

Circle side

shift 30.5" (**775 mm**) 29.5" (**749 mm**)

Maximum bank

sloping angle 90° 90°

Blade ground clearance 17.5" (**445 mm**)

Blade cutting depth 32.0" (**813 mm**)

Blade tilt range 44° forward 6.5° back

Superior blade mobility permits steep ditch cutting angles and back sloping outside overall machine width.



Cab & controls



All controls are located in a 90° arc forward and to the right of the operator. Enclosed cab has a fully adjustable, cloth covered suspension seat as standard and comes with a 3" (**76 mm**) seat belt. Located forward of the operator are the engine oil pressure, coolant temperature and fuel level gauges, transmission gear indicator and a multi-function Contronic monitoring display. Located in the fully adjustable steering pedestal are the following switches: differential lock/unlock, hazard lights, combination turn signal, horn and high beam headlight. Heater and wiper/washer controls, (if equipped), lighting and accessory switches are grouped in the operator's right hand console. This console also contains the ignition key and access to the circuit breaker and fuse panel. Located to the right of the operator, above the console, are the AWD On/Off switch, a 16 position variable aggression dial and the hydrostatic Creep On/Off switch. An accelerator/decelerator foot pedal and slider type hand throttle are standard equipment. Outside mounted rear view mirrors (L&R) and a convex interior mirror are standard. Interior operator noise levels average 75 dB(A) per ISO 6394 (enclosed cab).

Cab options

- High capacity heater/air conditioner c/w adjustable vents, temperature control and variable speed fan

- Lower opening front windows

- Rear windshield wipers and washers

- Lower front window wipers and washers

- Modular, 24 volt radio and cassette player

- Operator Convenience Package included with air conditioner option (lunch box, steel vacuum bottle, cup holder and ashtray)

- 24 volt to 12 volt converter for electrical accessories or two way radio installations 25 or 60 amp available

- Bubble type slope meter

- Speedometer/odometer

Full height cab with ROPS

Inside dimensions

Height 74.0" (**1 880 mm**)

Width @ controls 56.0" (**1 422 mm**)

Depth @ controls 55.5" (**1 410 mm**)

An optional Low Profile Cab is available with an inside height of 62" (**1 575 mm**). All Volvo Grader cabs and canopies are designed to meet or exceed SAE J1040 APR. 88, ISO 3471/1-1986(E), and 86/295/EEC ROPS requirements. The seatbelt is 3" (**76 mm**) wide and meets SAE J386 JUNE 93; ISO 6683-1981(E).



Load sensing hydraulics

Closed Center Hydraulic System senses load requirements and maintains system pressure 350 psi (**24 Bar**) above the load pressure.

System features industry standard control arrangement complete with low effort, feathering type, short throw levers located on a fully adjustable control pedestal.

System incorporates lock valves to prevent cylinder drift under load in the following circuits: blade lift, moldboard tilt, circle shift, wheel lean, circle turn and articulation.

Hydraulic system features include axial piston pump, pressure and flow compensated, variable displacement with high output for smooth multi-functioning.

The pump drive shaft is equipped with Perma Lube U joints.

Maximum pressure 2,700 psi (**186 Bar**)
Output 2200 RPM. 0-75 U.S. gpm (**0-284 lpm**)
Filtration 10 micron spin-on type



Capacities

	U.S.Gal.	Litres
Fuel tank	120.0	454.0
Transmission	10.0	38.0
Final drive	6.0	23.0
Tandems (each)	26.4	100.0
Hydraulic oil tank	35.4	134.0
Coolant antifreeze protection to -58° F (-50° C) approx	8.2	31.0
Engine oil	10.4	39.5



Attachments

(Optional unless otherwise stated as standard equipment)

Snow

Hydraulic Wing	
• high-bench	4,800 lb (2 177 kg)
• low bench	4,000 lb (1 814 kg)
One Way Plow	2,350 lb (1 067 kg)
"V" Snow Plow	
• 9' (2 743 mm)	2,500 lb (1 134 kg)
• 10' (3 042 mm)	2,650 lb (1 202 kg)

Earth

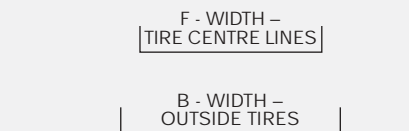
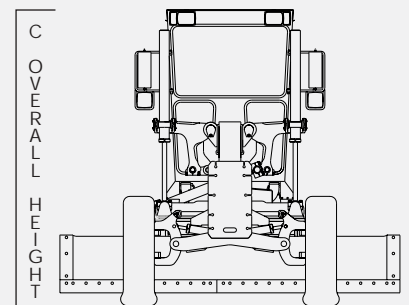
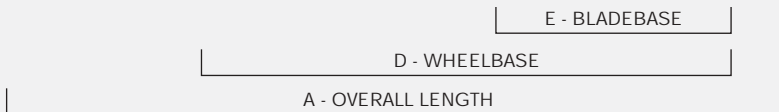
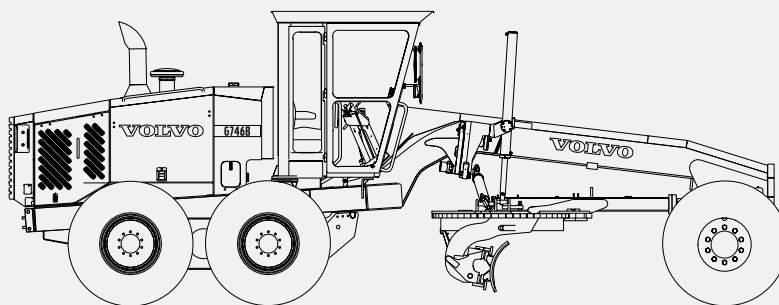
Dozer Blade	
• 8' (2 438 mm)	2,620 lb (1 188 kg)
• 9' (2 743 mm)	2,870 lb (1 302 kg)
• 10' (3 048 mm)	3,120 lb (1 415 kg)
Front Mounted Scarifier	1,780 lb (807 kg)
Mid-mount Scarifier	1,725 lb (782 kg)
Push Block	1,125 lb (510 kg)
Ripper/Scarifier, rear	2,880 lb (1 306 kg)

Dimensions with standard equipment

All dimensions are approximate

- A Overall length 30'5" (**9 271 mm**)
- D Wheelbase 20'6" (**6 248 mm**)
- E Bladebase
- ISO 7134 8'11" (**2 718 mm**)

- B Overall width 8'4" (**2 540 mm**)
- C Overall height 11'2" (**3 404 mm**)
- with Low Profile Cab 10'2" (**3 099 mm**)
- F Width – Tire centre lines 7'0" (**2 136 mm**)



STANDARD FEATURES

Volvo "High Torque" All Wheel Drive with hydrostatic Creep feature	Hardened circle drive pinions for maximum pinion life	Dual leaning wheel cylinders
Operator controlled, lock/unlock differential final drive	Isolation mounted cab, transmission and engine for reduced noise and vibration	DURAMIDE™ wear strips on circle clamp plates and guide shoes prevent metal-to-metal contact for maximum service life.
4 wheel, crossover, dual braking system with reserve power assist	Adjustable steering pedestal with tilt head for maximum operator comfort	Hinged cooling module doors for easy trash clean out
Park brake with operator warning alarm and indicator	Gauges include: coolant temperature, engine oil pressure, fuel level, hourmeter, air cleaner service indicator, articulation angle indicator, multi-function Contronic Monitoring System with visual and audible warnings	Lights; backup, tail, stop and directional
Fully sequential, direct drive, powershift 8400 transmission, with transmission guard	Load sensing, Closed Center Hydraulic System with short throw, low effort control levers. Hydraulically operated blade lift, circle turn, moldboard slide and tilt, circle shift and wheel lean functions and articulation	Backup alarm with automatic volume levels
13.5" (343 mm) diameter, 5 plate, oil cooled and lubricated master clutch	Feathering type controls for precise blade adjustments	Painted high gloss Volvo yellow and gray
Moveable Blade Control System for optimum blade mobility	Deluxe, cloth covered, fully adjustable suspension seat when grader is equipped with an enclosed cab	Lockable tool box with storage space for scarifier shanks
Full front and rear frame sections designed to withstand shock loading of attachments	120 U.S. gallon (454 l) fuel tank capacity	Engine side panels complete with locks
Circle drive counter-balance valve protects against impact damage		Left and right outside rear view mirrors
Hardened circle teeth cut on outside of circle for maximum leverage and minimum wear		Interior rear view mirror
		Exhaust aspirated air cleaner
		Front cab wiper and washer standard when grader is equipped with an enclosed cab
		VHP - variable horsepower

OPTIONAL EQUIPMENT

	lb	kg		lb	kg		lb	kg
Accumulators - blade lift (2)	122	55	• Front mounted plow lights - 2			Secondary steering (power assisted)	95	43
Accumulators - sideshift	50	23	• high mount	120	54	Tie down brackets	100	45
Air conditioner - 35,000 BTU			• low mount	100	45	Tires		
• HFC-134a (non-CFC refrigerant)	130	59	• Headlights with dimmer switch	0	0	• 17.5 x 25, 12 PR, G-2,		
Brush guards	40	18	• Moldboards lights - 2	2	1	14" (356 mm) rims	825	374
Cab			• Rear flood lights - 2	2	1	• Consult your Volvo dealer for full		
• canopy shell with ROPS - deduct . . . (625) (284)			• Snow wing lights - 2	2	1	range of tire and wheel options		
• FOPS protection for ROPS cabs	220	100	Fenders			Tool kit	-	-
• Low Profile Cab			• Front	80	36	Transmission sump heater	-	-
with ROPS - deduct (270) (122)			• Rear	400	182	Low ambient fluids	-	-
Cab heater - 50,000 BTU with cab			Moldboards			Vandalism protection	8	4
pressurizer and replaceable filter	60	27	• 13' x 29" x 1"			Wheel weights for rear		
Defroster fans	3	1	(3 962 x 737 x 25 mm)	129	59	wheels only - each	250	113
Engine block heater	3	1	• 14' x 29" x 1"			Window - opening - lower front	-	-
Engine precleaner - Turbo II	6	3	(4 267 x 737 x 25 mm)	260	118	Window - opening sliders - left/right	-	-
First user lifetime frame warranty	0	0	Moldboard extensions			Wiper and washer - rear	-	-
Float control, right and left detent style			R or L - 2' (610 mm)	236	107	Wiper and washer - lower front	-	-
independent	15	7	Moldboard edges - carbide 3/4" x 5"			Rear tailgate guard	200	90
Front attachment float control, detent style,			(19 x 127 mm)	-	-	Intermittent wipers, front and rear	-	-
independent of other float valves	15	7	100 amp alternator	0	0			
Hydraulic tank heater	3	1	Paint - custom colors	-	-			
24 volt radio/cassette player	6	3	Polar protection	0	0			
Lights			Reflectors - side	-	-			
• Beacon (amber or blue)	10	4	Remote valve for attachments					
• Clearance lights front & rear	2	1	• 3 or 5 bank - remote mount	85	39			

Your safety and the safety of those around you depends on using care and judgement when operating and servicing your grader. Do not operate the grader until you read and understand the warnings and instructions in the operator's manual. Volvo Motor Graders Limited is an ISO 9001 and 14001 registered company. www.volvo.com

Under our policy of continuous product development and 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.

Consult your Volvo dealer for recommended option and attachment selection.

VOLVO

Construction Equipment

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