## **VOLVO MOTOR GRADER**

# G746B



- Configuration: Articulated frame
- Engine model: Volvo D10BGAE2
- Maximum net engine output @2100 RPM (per SAE J1349): 163 - 181 kW (219 - 243 hp)
- Base weight: 17 350 kg (38,250 lb)
- Blade down force: 9 212 kg (20,308 lb)
- Blade pull:
   All Wheel Drive 14 786 kg
   (32,598 lb)
   Tandem 10 931 kg (24,098 lb)
- 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 and 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 0-3,2 km/h (0-2.0 mph) for optimum fine grading
- Wheel motor efficiencies maintained in both forward and reverse
- AWD available at speeds up to 31,4 km/h (19.5 mph)
- Equipped with the fuel-efficient, long life Volvo engine that complies to the EPA Tier II, EU Stage II emission standards





#### OPERATING WEIGHT

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

#### Base

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

#### Typically equipped operating weight:

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

G746B	. 18	456	kg (40	),688	lb)
Maximum combined capacity	. 23	043	kg <b>(5</b>	0,800	lb)
Maximum weight - front	7	575	kg (10	3,700	lb)
Maximum weight - rear	15	468	kg (34	4,100	lb)

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**

Blade pull at base weight (no wheel slip, 0.9 traction 

Tandem-Maximum blade pull (no wheel slip, 0.9 traction co-efficient) tandem 

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

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



#### **ENGINE DATA**

_	
Λ	Make/Model Volvo D10BGAE2
Τ	ype 4 Cycle, Turbocharged, Aftercooled
Ν	lo. of cylinders
Е	Bore & stroke
	Displacement
Λ	Maximum net engine output @ 2100 RPM
(	per SAE J1349)
F	Rated gross brake horsepower @ 2100 RPM
•	Gears forward 1, 2 and Reverse 1
•	Gears forward 3-8 and Reverse 2-4
F	Rated net brake horsepower @ 2100 RPM
•	Gears forward 1, 2 and Reverse 1
	Torque @ 1000 RPM
	Torque rise
•	Gears forward 3-8 and Reverse 2-4
	Torque @ 1100 RPM 1 145N.m (846 lb.ft)

#### All Wheel Drive engaged

Rated gross brake horsepower @ 2100 RPM	
• All gears	. 186 k

kW (249 hp) Rated not brake horsenower @ 2100 RPM

181 kW (243 hp)
1 145 N.m (846 lb.ft)
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 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 1920 watt (80 amp) 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**

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 km/h mph	Gears km/h mph
1 4,2 2.6	1
2 5,9 3.7	
3 8,2 5.1	2 8,2 5.1
4 11,4 7.1	
5 16,1 10.1	3 16,1 10.1
6 22,7 14.1	
7 19.5	4 31,4 19.5
8 43.8 27.2	

Transmission guard is standard equipment and is hinged for easy access. Perma Lube U joints on the input/output drive shafts.



## **DIFFERENTIAL / FINAL DRIVE**

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

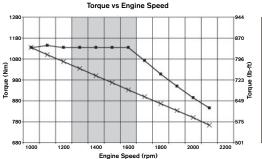


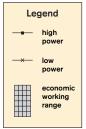
#### **TANDEMS**

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

Depth 622 mm (24.50")
Width
Thickness • inner wall
• outer wall
Center distance
Drive chain pitch
Oscillation +15°

#### ENGINE PERFORMANCE CURVE









#### **BRAKES**

Service Brakes: Foot operated

Fade resistant, hydraulically actuated, wet multiple disc service brakes located at the four 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 four 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 AND TIRES

Tire size	4, G-2
Ply rating (PR)	12
Rim size	ece rim
Bolt-on rims are not interchangeable between front and rear. One p	iece
rim available	



#### **FRONT AXLE**

Type: Robotically welded steel truss, gusseted for torsional strength, oscillates on a single 80 mm (3.15") diameter center pivot pin.

Wheel lean 1	8° R & L
Oscillation16° up a	nd down
Ground clearance	1 <b>(24.0")</b>

Two 76 mm (3") 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 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.

. 0	0 0	•
Typical operating pressure		206 Bar (3,000 psi)
Maximum operating pressure		
Minimum operating pressure		
Top speed	3	I.4 km/h (19.5 mph)
Creep Mode speed	0	3.2 km/h (0-2 mph)
Maximum rim pull		3 856 kg <b>(8,500 lb)</b>

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 3,2 km/h (2 mph) for fine grading as well as a top speed of 31,4 km/h (19.5 mph) 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.

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 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

Plate thickness • sides ...... 25 mm (1.00") Vertical section modulus Linear weight - minimum-maximum. . . . 221.3 - 363.4 kg/m (148.7 - 244.2 lb/ft)

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.



#### ARTICULATION

Twin 127 mm (5") 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 nine 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-tometal contact and provide maximum service life.

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

Diameter	1 683 mm <b>(66.25")</b>
Thickness	32 mm (1.25")
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.

0 ,	
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 



#### **MOLDBOARD**

Standard moldboard with	
replaceable end bits 3 6	358 x 737 x 25 mm
	(12' x 29" x 1")
Blade materialSAE 1050	0 high carbon steel
Edge through hardened	16 mm boron steel
	(6" x 5/8")
Bolt spacing	152 mm (6")
• bolt size	16 mm <b>(5/8")</b>
Slide rails supported by DURAMIDE™ bearings.	



#### **BLADE RANGE**

(Dimensions shown with standard moldboard)

(Dimensions shown with standard moldboard)
LEFT RIGHT
Reach outside tires - articulated frame
3 048 mm (120.0") 3 035 mm (119.5")
Reach outside tires - straight frame
Blade slide
Circle side shift
Maximum bank sloping angle90°90°
Blade ground clearance
Blade cutting depth
Blade tilt range
Superior blade mobility permits steep ditch cutting angles and back
sloping outside overall machine width.



### CAB AND 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 76 mm (3") 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 rearview mirrors (L&R) and a convex interior mirror are standard. Interior operator noise levels average 75 dB(A) per ISO 6394 (enclosed cab).

- 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	1	880 mm	(74.0")
Width @ controls	1	422 mm	(56.0")
Depth @ controls	1	410 mm	(55.5")

An optional Low-Profile Cab is available with an inside height of 1 575 mm (62"). 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 76 mm (3") 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 24 Bar (350 psi) 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.



#### **CAPACITIES**

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



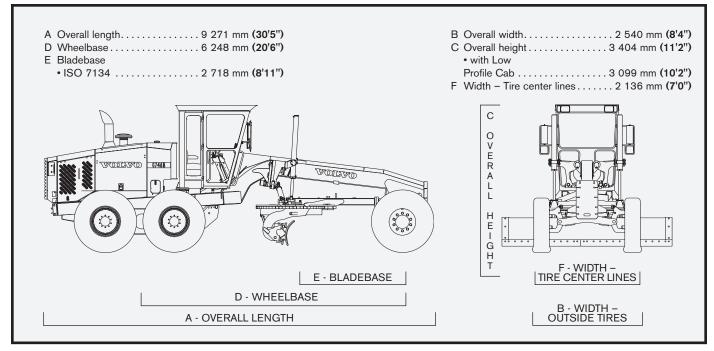
#### **ATTACHMENTS**

# (Optional unless otherwise stated as standard equipment) Snow

Show	
Hydraulic Wing	
• high-bench2 177 kg	(4,800 lb)
• low-bench	(4,000 lb)
One Way Plow 1 065 kg	(2,350 lb)
"V" Snow Plow	
• 2 743 mm <b>(9')</b> 1 134 kg	(2,500 lb)
• 3 042 mm (10') 1 202 kg	(2,650 lb)
Earth	
Dozer Blade	
• 2 438 mm <b>(8')</b> 1 188 kg	(2,620 lb)
• 2 743 mm <b>(9')</b> 1 302 kg	(2,870 lb)
• 3 048 mm <b>(10')</b> 1 415 kg	(3,120 lb)
Front Mounted Scarifier 807 kg	(1,780 lb)
Mid-mount Scarifier 782 kg	(1,725 lb)
Push Block	(1,125 lb)
Ripper/Scarifier, rear 1 306 kg	(2,880 lb)

#### Dimensions with standard equipment

All dimensions are approximate



#### STANDARD EQUIPMENT

Volvo "High Torque" All Wheel Drive with hydrostatic creep feature

Operator controlled, lock/unlock differential final drive

4 wheel, crossover, dual braking system with reserve power assist

Park brake with operator warning alarm and indicator

Fully sequential, direct drive, powershift 8400 transmission, with transmission guard

343 mm (13.5") diameter, 5 plate, oil-cooled and lubricated master clutch

Moveable Blade Control System for optimum blade mobility

Full front and rear frame sections designed to withstand shock loading of attachments

Circle drive counter-balance valve protects against impact damage

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

Hardened circle drive pinions for maximum pinion life

Isolation mounted cab, transmission and engine for reduced noise and vibration

Adjustable steering pedestal with tilt head for maximum operator comfort

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

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

Feathering type controls for precise blade adjustments

Deluxe, cloth covered, fully adjustable suspension seat when grader is equipped with an enclosed cab.

120 U.S. gallon **(454 I)** fuel tank capacity Dual leaning wheel cylinders

DURAMIDE™ wear strips on circle clamp plates and guide shoes prevent metal-to-metal contact for maximum service life.

Hinged cooling module doors for easy trash clean out

Lights; backup, tail, stop and directional Backup alarm with automatic volume levels Painted high gloss Volvo yellow and gray Lockable toolbox with storage space for

Lockable toolbox with storage space for scarifier shanks

Engine side panels complete with locks Left and right outside rearview mirrors Interior rearview mirror

Exhaust aspirated air cleaner

Front cab wiper and washer standard when grader is equipped with an enclosed cab VHP - variable horsepower

#### **OPTIONAL EQUIPMENT** (Standard in certain markets)

Accumulators - blade lift (2)       55       122       • Front mounted plow lights - 2         Accumulators - sideshift       23       50       • high-mount       54       120         Air-conditioner - 35,000 BTU       • low-mount       45       100	Secondary steering (power assisted) 43 9 Tie down brackets
• HFC-134a (non-CFC refrigerant) 59 130 Brush guards 18 40 Cab • Canopy shell with ROPS – deduct (284) (625) • FOPS protection for ROPS cabs 100 220 • Low-Profile Cab with ROPS – deduct (122) (270) Cab heater - 50,000 BTU with cab pressurizer and replaceable filter 27 60 Defroster fans 1 3 (13' x 29" x 1") 59 129 Engine block heater 1 3 (14' x 29" x 1") 118 260 First user lifetime frame warranty 0 Float control, right and left detent style independent of other float valves 7 15 Hydraulic tank heater 1 3 24 volt radio/cassette player 3 6 Lights - 2 1 2 • Rear flood lights - 2 1 2 • Rear flood lights - 2 1 2 • Rear flood lights - 2 1 2 • Snow wing lights - 2 1 2 • Snow wing lights - 2 1 2 • Snow wing lights - 2 1 2 • Rear flood lights - 2 1 2 • Snow wing lights - 2 12 • Snow wing lights - 2 12 • Rear flood lights - 2 12 • Snow wing lights - 2 12 • Snow wing lights - 2 12 • Snow wing lights - 2 12 • Snow ving lights - 2 12 • Snow ving lights - 2 12 • Rear flood lights - 2 12 • Rear flood lights - 2 12 • Snow ball at lights in the light specified in the light specified in the light spe	Tires  17.5 x 25, 12 PR, L-2, 356 mm (14") rims

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 North America, Inc.

One Volvo Drive, Asheville, NC 28803-3447 www.volvoce.com