VOLVO MOTOR GRADERS

G946



MORE CARE. BUILT IN.



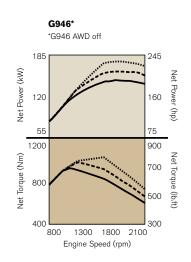
SPECIFICATIONS

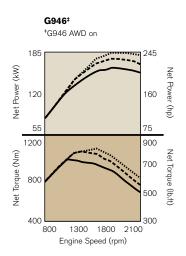
		G946
Base operating weight - approximate		
Weights shown include enclosed low profile cab with ROPS, all operation	ng fluids,	
operator and standard equipment.		
Base - Total	kg (lb)	17 300 (38,140)
On front wheels	kg (lb)	5 000 (11,020)
On rear wheels	kg (lb)	12 300 (27,120)
Maximum combined capacity	kg (lb)	21 770 (48,000)
Maximum weight - front	kg (lb)	7 570 (16,700)
Maximum weight - rear	kg (lb)	14 240 (31,400)
Note that adding weight and attachments to the base grader may nece be exceeded.	essitate a tire upgrade as r	naximum weight capacity of tire may
Productivity (Standard equipment)		
Blade pull at base weight (0.9 traction co-efficient)	kg (lb)	14 925 (32,908)
Blade pull at maximum base weight (0.9 traction co-efficient)	kg (lb)	16 671 (36,760)
Blade down force capability	kg (lb)	8 650 (19,035)
Blade down force is the maximum downward force which may be applied	ed at the cutting edge.	
Engine data		
Model		Volvo D7E
Turbocharged, aftercooled with replaceable wet-type cylinder liners.		
No. of cylinders		In Line 6
Bore & stroke	mm (in)	108 x 130 (4.25 x 5.12)
Displacement	l (cu in)	7,2 (436)
Engine certified to US EPA Tier 3/EU Stage IIIA exhaust emission star	ndards.	
Electrical system		24 volt - 1920 watt
		(80 amp) alternator
Batteries (two 12 volt) maintenance free, heavy duty		1125 CCA 195 RC
Two 12 volt 1125 CCA (195 RC) or1300 CCA (385 RC) batteries avail	ilable optionally.	

Engine performance curve

High Range Mid Range Base Power Engine Power

Engine Torque





		G946 AWD off	G946 AWD on
3 Range engine power control			
Base range power			
Rated net brake horsepower @ 1900 RPM§	kW (hp)	130 (175)	145 (195)
Torque	N.m (lb.ft)	987 (728) @1200	1 047 (772) @1300
Mid range power			
Rated net brake horsepower @ 1900 RPM§	kW (hp)	145 (195)	160 (215)
Torque	N.m (lb.ft)	1 010 (745) @1400	1 066 (786) @1500
High range power			
Rated net brake horsepower @ 2100 RPM§	kW (hp)	160 (215)	175 (235)
Maximum net horsepower @ 1800 RPM	kW (hp)	168 (225)	180 (242)
Torque	N.m (lb.ft)	1 023 (754) @1550	1 073 (791) @1500
Engine de-rating at 3 000 m (9,800 ft) altitude		None	4%
Rated net horsepower SAE J1349/ISO 9249			

[§]Optional, operator controlled Power / Speed Engine Mode allows 2100 RPM in Base and Mid power ranges. Not available in the European Union.

Transmission

Fully sequential, direct drive, Volvo powershift transmission. Engine cannot be started if transmission is in gear. Single lever electronic transmission controller provides self-diagnostics and overspeed protection. Optional HTE1160 has automatic shifting and travel mode as standard equipment.

Approximate values - ground speeds may vary based upon tire brand

Transmission	HTE840	8-Speed		HTE1160 11-Speed		
Tire Size	14:00	17.5		14:00	17.5	
Gear @ RPM	km/h (mph)	km/h (mph)	Gear @ RPM	km/h (mph)	km/h (mph)	
F1 @ 1900	3,8 (2.4)	3,8 (2.4)	F1 @ 1900	3,0 (1.9)	2,9 (1.8)	
F2 @ 1900	5,3 (3.3)	5,3 (3.3)	F2 @ 1900	3,9 (2.4)	3,8 (2.4)	
F3 @ 1900	7,5 (4.7)	7,4 (4.6)	F3 @ 1900	5,2 (3.2)	5,1 (3.2)	
F4 @ 1900	10,5 (6.5)	10,3 (6.5)	F4 @ 1900	6,7 (4.2)	6,6 (4.1)	
F5 @ 1900	14,9 (9.3)	14,7 (9.2)	F5 @ 1900	8,8 (5.5)	8,7 (5.4)	
F6 @ 2100	20,8 (13.0)	20,5 (12.8)	F6 @ 1900	11,4 (7.1)	11,2 (7.0)	
F7 @ 2100	32,2 (20.1)	31,8 (19.9)	F7 @ 1900	16,6 (10.4)	16,4 (10.3) 21,9 (13.7)	
F8 @ 2100	44,9 (28.1)	44,4 (27.7)	F8 @ 2100	22,2 (13.9)		
			F9 @ 2100	28,8 (18.0)	28,4 (17.8)	
			F10 @ 2100	37,7 (23.6)	37,2 (23.3)	
			F11 @ 2100	48,8 (30.5)	48,2 (30.1)	
R1 @ 1900	3,8 (2.3)	3,7 (2.3)	R1 @ 1900	2,9 (1.8)	2,9 (1.8)	
R2 @ 1900	7,4 (4.6)	7,3 (4.5)	R2 @ 1900	5,1 (3.2)	5,0 (3.1)	
R3 @ 1900	14,6 (9.1)	14,4 (9.0)	R3 @ 1900	8,6 (5.4)	8,5 (5.3)	
R4 @ 2100	31,6 (19.8)	31,2 (19.5)	R4 @ 1900 12,6 (7.9)		12,5 (7.8)	
			R5 @ 2100	21,8 (13.6)	21,5 (13.5)	
			R6 @ 2100	37,1 (23.2)	36,6 (22.9)	

	Transmission Gear				
Engine Power Range	Volvo HTE840	Volvo HTE1160			
Base	F1, F2 R1	F1, F2, F3 R1, R2			
Mid	F3, F4, F5 R2, R3	F4, F5, F6, F7 R3, R4			
High	F6, F7, F8 R4	F8, F9, F10, F11 R5, R6			

		G946
Tandems		
Depth	mm (in)	226,5 (8.9)
Height	mm (in)	616 (24.25)
Thickness		
inner wall	mm (in)	25 (1)
outer wall	mm (in)	20 (.78)
Center distance	mm (in)	1 550 (61)
Drive chain pitch	mm (in)	51 (2)
Oscillation	degrees ±	15°
Differential / Final drive Model		Volvo APR70
Planetary final reduction with an operator controlled wet multiple disc lo	ock/unlock differential.	
Wheels & tires (Standard equipment)		
Tire size		14:00 x 24, G-2
Ply rating (PR)		12
Rim size	mm (in)	254 (10) Three piece rim
Bolt-on rims interchangeable between front and rear		No
Front axle and articulation		
Wheel lean	degrees R & L	18°
Oscillation	degrees up & down	16°
Ground clearance	mm (in)	610 (24)
Minimum turning radius using front axle steering, articulation, wheel lean and unlocked differential	mm (ft)	7 265 (23'10")
Steering arc	degrees	50°
Frame articulation angle	degrees	23°
Anti-drift lock valve ensures stable operation. Articulation lock standard		
Hydrostatic power steering of front wheels incorporating two steering of EN12643:1997 with optional secondary steering.	cylinders. Meets SAE J1511	FEB. 94, ISO 5010:1992,

Brakes

Service Brakes: Foot operated

Fade resistant, hydraulically actuated, wet multiple disc service brakes located at the 4 tandem drive wheels are 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 hydraulically released enclosed wet multiple disc type parking brake in final drive.

Effective on all 4 tandem drive wheels.

Transmission cannot be engaged with park brake on.

Braking systems comply to SAE J/EN ISO 3450:1996.

Volvo uses asbestos free brake components.

mm (in)	265 x 340 (10.5 x 13.5)
mm (in)	20 (.79)
cm³ (cu in)	2 671 (163)
cm³ (cu in)	2 256 (138)
cm³ (cu in)	4 652 (284)
mm (in)	254 x 100 (10 x 4)
mm (in)	12,7 (.5)
articulation pins and bear	rings.
mm	22 x 635 x 3 658
(in)	(.87 x 25 x 12')
	SAE 1050 high carbon steel
mm (in)	152 x 16 (6 x 5/8) boron steel
mm (in)	152 (6)
mm (in)	16 (5/8)
	YES
	Left/Right
mm	3 048/3 035
(in)	(120/119.5)
mm	2 020/2 010
(in)	(80/79)
mm	673/673
(in)	(26.5/26.5)
mm	775/749
(in)	(30.5/29.5)
degrees	90°/90°
	YES
mm (in)	445 (17.5)
mm (in)	790 (31)
degrees forward	45°
degrees back	6°
	cm³ (cu in) cm³ (cu in) cm³ (cu in) cm³ (cu in) mm (in) degrees

		G946
Circle		
Pitch diameter	mm (in)	1 626 (64)
Thickness	mm (in)	32 (1.25)
Adjustable guide shoes - standard / optional	,	3/5
Adjustable clamp plates - standard / optional	,	3/5
Upper circle wear plates - standard / optional		3/5

Circle to drawbar support is provided by Duramide™ wear plates and bearings at the clamp and guide shoes. Duramide™ prevents metal-to-metal contact and provides maximum service life.

Circle drive

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

Rotation	degrees	360°
Drawbar		
Dimensions of box section	mm (in)	165 x 165 (6.5 x 6.5)
Plate thickness	mm (in)	25 & 19 (1 & .75)
Cab & controls		
Low profile cab with ROPS/FOPS		
Interior height	mm (in)	1 620 (64)

An optional full height cab is available with an inside height of 1 837 mm (72.5").

All Volvo Grader cabs and canopies are designed to meet or exceed SAE J/ISO 3471-1:2004 and EN 13510:2000 ROPS requirements and SAE J/ISO 3449:2005 Level 2 FOPS requirements.

The retractable seatbelt is 76 mm (3") wide and meets SAE J386 NOV. 97 and EN ISO 6683:1999. Industry standardized control lever arrangement.

Interior operator noise levels average 72 dB(A) per ISO 6394:1998 (enclosed cab).

Implement hydraulics

Circuit type: Closed center, load sense Proportional Demand Flow (PDF) Hydraulic System, with O-ring face seal hose connections.

Main implement pump type		Axial piston type		
Maximum pressure	Bar (psi)	207 (3,000)		
Output 2100 RPM	lpm (gpm)	208 (55)		
Stand by pressure	Bar (psi)	24 (350)		

Large capacity, replaceable in-tank filter. Filters both system and re-fill oil. Low level and high temperature operator warning.

Hydraulic fan drive pump

Separate axial piston pump dedicated to the variable speed cooling fan. Reversible cooling fan optionally available.

		G946
Capacities		
Fuel tank	I (U.S. Gal.)	400 (105)
Transmission	l (U.S. Gal.)	61 (16)
Final drive	I (U.S. Gal.)	22,7 (6)
Tandems (each)	I (U.S. Gal.)	100 (26.4)
Hydraulic oil tank	I (U.S. Gal.)	144 (38)
Coolant antifreeze protection to -50° C (-58° F) approx	I (U.S. Gal.)	34 (9.0)
Engine oil	l (U.S. Gal.)	21,5 (5.7)
Attachments		
(Optional unless otherwise stated as standard equipment)		
Push Block	kg (lb)	515 (1,138)
Ripper includes rear frame arch support and links	kg (lb)	1 495 (3,295)
Mid Mount Scarifier		905 (1,995)
Front Mount Scarifier	kg (lb)	715 (1,575)
Dozer: 2,4 m (8')	kg (lb)	1 080 (2,380)
2,7 m (9')	kg (lb)	1 140 (2,515)
All Wheel Drive		
Maximum operating pressure	Bar (psi)	345 (5,000)
Minimum operating pressure	Bar (psi)	34 (500)
Top speed with AWD engaged	km/h (mph)	33 (20.4)
Maximum rim pull	kg (lb)	3 855 (8,500)

When equipped with the HTE840 transmission, the Volvo high torque All Wheel Drive System operates in forward gears 1-7 and reverse gears 1-4.

When equipped with the HTE1160 transmission, the Volvo high torque All Wheel Drive System operates in forward gears 1-10 and reverse gears 1-6.

System provides the operator with the ability to fine grade in Creep Mode using only hydrostatic front wheel drive, between 0 - 4 km/h (0 - 2.5 mph).

Dimensions

All dimensions are approximate.

Legend

A = Overall length

B = Bladebase per ISO 7134

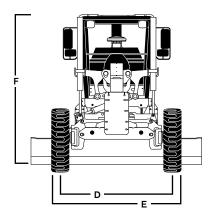
 $\mathsf{C} = \mathsf{Wheelbase}$

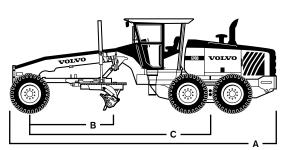
 $\mathsf{D} = \mathsf{Width}$ - Front tire center lines

 $\mathsf{E} = \mathsf{Width} - \mathsf{Outside} \ \mathsf{tires}$

F = Overall height with Low Profile CabAdd 217 mm (8.5") for full height cab

Α		mm (in)	9 150 (360)
В		mm (in)	2 650 (104)
С		mm (in)	6 280 (247)
D		mm (in)	2 076 (82)
Ε	14:00 17.5	mm (in) mm (in)	2 537 (100) STD 2 717 (107)
F		mm (in)	3 225 (127)





STANDARD FEATURES / OPTIONAL EQUIPMENT

Model (S - Standard / O - Optional)	G930	G940	G946	G960	G970	G976	G990
Powertrain	•						
Volvo engines are certified to US Tier 3/EU Stage IIIA emission criteria	S	S	S	S	S	S	S
Rear axle, operator controlled, lock/unlock differential with planetary final reduction	S	S	S	S	S	S	S
4 wheel wet disc braking system with crossover dual circuits and reserve power assist	S	S	S	S	S	S	S
Spring applied wet multiple disc park brake with operator warning alarm and indicator	s	S	S	S	S	S	S
Electronic hand throttle with RPM hold and resume functions	s	S	S	S	S	S	S
Operator controlled Power/Speed engine mode (N/A in the European Union)	0	0	0	0	0	0	0
Direct drive, power shift Volvo HTE840 transmission with 8 forward and 4 reverse gears	S	S	S	S	S	S	S
Single transmission control lever, with electronic over speed protection, advanced	s	S	S	S	S	S	S
memory shift and park position lockout with hinged transmission guard							
Transmission Autoshift and Travel functions	0	0	0	0	0	0	0
Direct Forward to Reverse shuttle shift capability without using the Inching pedal	S	S	S	S	S	S	S
Volvo HTE1160 Transmission - 11 speeds forward 6 speeds reverse includes Autoshift and travel functions	0	0	0	0	0	0	0
Hydraulically driven – variable speed cooling fan	s	S	s	S	S	S	S
Reversible cooling fan - manual or automatic modes	1 0	0	0	0	0	0	0
Automatic engine protection lowers engine torque and speed if critical conditions occur	s	S	S	S	S	S	S
Electrical							
Cab mounted headlights with dimmer switch	S	S	S	S	S	S	S
Lights; backup, tail, stop and directional	S	S	S	S	S	S	S
Backup alarm 112 dB(A)	S	S	S	S	S	S	S
Moldboards work lights - 2 or 4	0	0	0	0	0	0	0
Rear work lights - 2 or 4	0	0	0	0	0	0	0
Corner cab work lights - left or right - 2	0	0	0	0	0	0	0
2460 watt (110 amp) alternator	0	0	0	0	0	0	0
24 volt to 12 volt converter - 600 or 1440 watt (30 or 60 amp) with power point	0	0	0	0	0	0	0
Productivity	•				•		
Heavy duty circle support system	0	0	0	0	0	0	S
Metallic lower moldboard slide bearing	0	0	0	0	0	0	S
Hinged cooling module fan door for easy trash clean out	S	S	S	S	S	S	S
Ground level fueling	S	S	S	S	S	S	S
Lockable tool box with storage space for scarifier shanks	S	S	S	S	S	S	S
Brackets for Automatic Blade Control System installation	0	0	0	0	0	0	0
Under side rear guards	0	0	0	0	0	0	0
Parts and Service Manual on CD - English only	0	0	0	0	0	0	0
Front fenders/lean and steer with tire - plastic	0	0	0	0	0	0	0
Rear fenders - oscillates with tandem - steel	0	0	0	0	0	0	0
Hydraulics							
Proportional Demand Flow hydraulic system with short throw, low effort control levers	S	S	S	S	S	S	S
10 section hydraulic control valve - includes two spare sections with levers	S	S	S	S	S	S	S
Circle turn relief located integral with main manifold	S	S	S	S	S	S	S
Hydraulic oil level monitor via Contronics	S	S	S	S	S	S	S
Blade Lift Float Control, independent right and left detent style	0	0	0	0	0	0	0
Front attachment float control, detent style, independent of other float valves	0	0	0	0	0	0	0
Up to 5 additional remote valve locations for attachments	0	0	0	0	0	0	0
Blade lift accumulators – operator controlled from cab	S	S	S	S	S	S	S
Secondary steering (power assisted)	0	0	0	0	0	0	0
Other	_						
First user lifetime frame warranty – includes articulation pins and bearings	0	0	0	0	0	0	0
Low ambient fluids for extreme cold conditions below -10° C (-14° F)	0	0	0	0	0	0	0
Sound reduction packages (Standard in EU markets)	0	0	0	0	0	0	0
Rear licence plate bracket	0	0	0	0	0	0	0
Air compressor - engine driven with tank capable of operating hand tools	0	0	0	0	0	0	0
Volvo CareTrack - remote monitoring system	0	0	0	0	0	0	0

Model (S - Standard / O - Optional)				G930	G940	G946	G960	G970	G976	G990
Operator Cab										
Two lockable operator cab doors complete with inside and	d ground l	evel releases		S	S	S	S	S	S	S
Illuminated entry when cab doors are opened - enclosed	-			S	S	S	S	S	S	S
Adjustable steering control pedestal with tilt head for max		erator comfort		S	S	S	S	S	S	S
Gauges include: coolant temperature, engine oil pressure, fuel level, hourmeter, articulation angle indicator			S	S	S	S	S	S	S	
Multi-function Volvo Contronic Monitoring System with visual and audible warnings			S	S	S	S	S	S	s	
Deluxe, cloth covered, fully adjustable suspension seat when grader is equipped with an enclosed cab - 75 mm (3") retractable seatbelt			S	S	S	S	S	S	S	
Deluxe air suspension, cloth covered, fully adjustable suspension seat - 75 mm (3") retractable seatbelt			0	0	0	0	0	0	0	
Left and right outside dual rear view mirrors				S	S	S	S	S	S	S
Fold-away left and right outside dual rear view mirrors				0	0	0	0	0	0	0
Heated outside left and right dual rear view mirrors				0	0	0	0	0	0	0
Dual interior rear view mirrors				S	S	S	S	S	S	S
Enclosed Low Profile Cab with ROPS and FOPS – left and right cab door with steps				S	S	S	S	S	S	S
Enclosed High Profile Cab with ROPS and FOPS – left and right cab door with steps				0	0	0	0	0	0	0
Low Profile canopy shell (SPLIT) with ROPS - left and right entry with steps				0	0	0	0			
Cab heater - 50,000 BTU with cab pressurizer and replaceable filters, 10 outlets				S	S	S	S	S	S	S
Air conditioner - 35,000 BTU • HFC-134a (non-CFC refrigerant) with cab heater				0	0	0	0	0	0	0
Defroster fan with 5 outlets directed at front windows and doors				0	0	0	0	0	0	0
Radio/CD player with 4 concealed speakers in head lines				0	0	0	0	0	0	0
Single arm front cab wiper and washer, enclosed cab				S	S	S	S	S	S	S
Single arm wiper and washer - rear window				0	0	0	0	0	0	0
Single arm wiper and washer - lower windows front left & right				0	0	0	0	0	0	0
Dual arm front windshield, increased coverage, Low Profile Cab only				0	0	0	0	0	0	0
Intermittent wipers on all wipers ordered				0	0	0	0	0	0	0
Window - lower front - opening				0	0	0	0	0	0	0
Window - left/right side - opening sliders with multiple position open		enings		0	0	0	0	0	0	0
Lower cab shield, encloses bottom of cab to frame				0	0	0	0	0	0	0
Model (S - Standard / O - Optional)		G930	G940	G946		G960	G970	G97	76	G990
Model (S - Standard / O - Optional) Tires and Rims - Availability and approximate weight in	crease fro			G946		G960	G 970	G 97	76	G990
Tires and Rims - Availability and approximate weight ind	crease fro			G946		G960	G970	G97	76	G990
	crease fro			G946		G960	G970	G9 2		G990
Tires and Rims - Availability and approximate weight inc		m base opera	ting weight					S		G990
Tires and Rims - Availability and approximate weight incomines - Consult your Volvo dealer for full offering 14:00 x 24 Bias	kg (lb)	m base opera S 185 (410)	ting weight S 185 (410)	S 185 (41	0) 18	S 85 (410)	S 185 (410)	S) 185 (4	410)	G990
Tires and Rims - Availability and approximate weight inc Tires - Consult your Volvo dealer for full offering 14:00 x 24 Bias 14:00 x 24 Radial	kg (lb) kg (lb)	s 185 (410) 120 (265)	s 185 (410) 120 (265)	S 185 (41 120 (26	0) 18	S 85 (410) 20 (265)	S 185 (410) 120 (265)	S) 185 (4	410)	G990
Tires and Rims - Availability and approximate weight inc Tires - Consult your Volvo dealer for full offering 14:00 x 24 Bias 14:00 x 24 Radial 17.5 x 25 Bias	kg (lb) kg (lb) kg (lb)	m base opera S 185 (410)	ting weight S 185 (410)	S 185 (41	0) 18	S 85 (410)	S 185 (410)	S) 185 (4) 120 (2) 280 (4	410) 265)	G990
Tires and Rims - Availability and approximate weight inc Tires - Consult your Volvo dealer for full offering 14:00 x 24 Bias 14:00 x 24 Radial 17.5 x 25 Bias 17.5 x 25 Radial	kg (lb) kg (lb)	s 185 (410) 120 (265) 280 (615)	s 185 (410) 120 (265)	S 185 (41 120 (26	0) 18	S 85 (410) 20 (265)	S 185 (410) 120 (265) 280 (615)	S) 185 (-) 120 (:) 280 (() 310 ((410) 265) 615)	S
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Moldboard edges - carbide 19 x 127 mm (3/4" x 5") or OOO

Partial listing of available options. Certain features may be standard or not available within specific market. Consult your Volvo Motor Grader distributor for more information.





Volvo Construction Equipment is different. Our machines are designed, built and supported in a different way. That difference comes from an engineering heritage of over 175 years. A heritage of thinking first about the people who actually use the machines. About how to help them be safer, more comfortable, more productive. About the environment we all share. The result of that thinking is a growing range of machines and a global support network dedicated to helping you do more. People around the world are proud to use Volvo. And we're proud of what makes Volvo different – **More care. Built in.**



Not all products are available in all markets. Under our policy of continuous 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.

