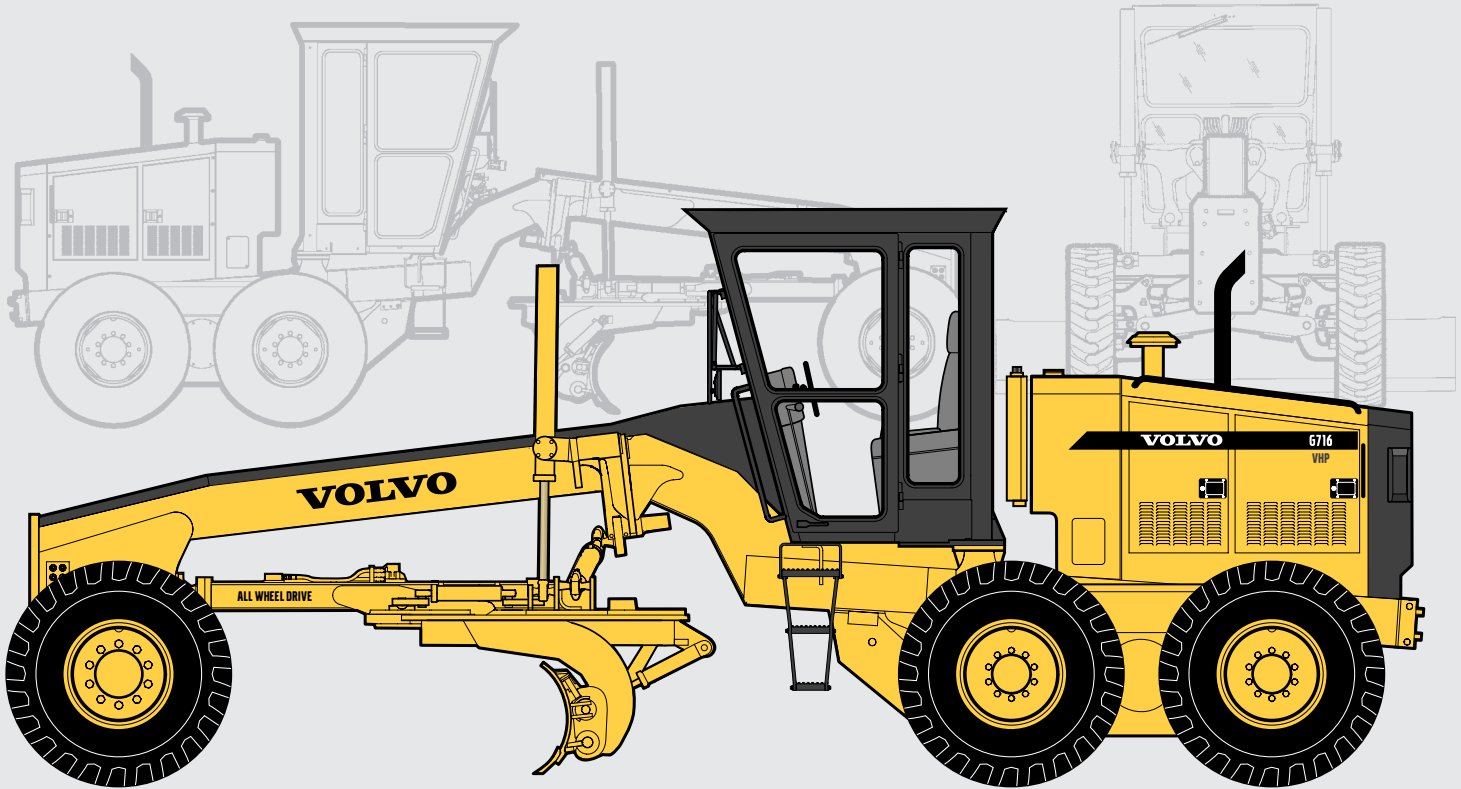


# VOLVO MOTOR GRADER G716 VHP

ALL WHEEL DRIVE



#### KEY FEATURES:

- 8400 fully sequential direct drive powershift transmission with “Smart Shifter” controller
- Choice of fully enclosed, quiet, comfortable ROPS cab in full height or low profile configuration, or ROPS canopy
- Moveable Blade Control System
- Load sensing, closed center hydraulic system with fully adjustable, low effort, controls
- Full front and rear frame sections for all attachment applications

#### ALL WHEEL DRIVE:

- Separate hydraulic pump & speed sensor for each front wheel
- 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 17.7 mph (28,6 km/h)

MODEL	G716 VHP	
	AWD Off	AWD On
Configuration	Articulated Frame All Wheel Drive	
Engine	Cummins 6B5.9	
Output (SAE J1349)	135 hp (101 kW) gears 1,2 160 hp (119 kW) gears 3-8	160 hp (119 kW) All Gears
Base weight	31,620 lb (14 343 kg)	
Blade down pressure	17,190 lb (7 797 kg)	
Blade pull	19,694 lb (8 933 kg)	27,194 lb (12 335 kg)

**VOLVO**



## BASE OPERATING WEIGHT (Standard Equipment)

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

### G716 VHP

Total ..... 31,620 lb (14 343 kg)  
On front wheels ..... 9,798 lb (4 444 kg)  
On rear wheels ..... 21,882 lb (9 899 kg)

Weight adjustments for various options are listed.

**Typically equipped operating weight:** includes 14:00 x 24", 12 PR, G-2 tires on 10" (254 mm) rims and 14" x 25" x 7/8" (4 267 mm x 635 mm x 22 mm) moldboard.

**G716 VHP** ..... 32,350 lb (14 674 kg)



## PRODUCTIVITY (Standard Equipment)

Maximum blade pull (no wheel slip, 0.9 traction co-efficient) ..... 27,194 lb (12 335 kg)

Blade down pressure

- cutting capability

(ISO 7134) ..... 17,190 lb (7 797 kg)

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



## ENGINE DATA

Make/Model ..... Cummins 6B5.9

Type ..... 4 Cycle, Turbocharged, Aftercooled

No. of cylinders ..... In Line 6

Bore & stroke ... 4.02" x 4.72" (102 mm x 120 mm)

Displacement ..... 359 cu in (5,9 L)

Rated gross brake horsepower @ 2200 RPM

- Gears forward 1, 2 and

Reverse 1 ..... 149 hp (111 kW)

Rated gross brake horsepower @ 2200 RPM

- Gears forward 3-8 and

Reverse 2-4 ..... 174 hp (130 kW)

Rated net brake horsepower @ 2200 RPM

- Gears forward 1, 2 and

Reverse 1 ..... 135 hp (101 kW)

Torque @ 1200 RPM ..... 422 lb.ft (572 N.m)

Torque rise (Net) ..... 34.5%

Rated net brake horsepower @ 2200 RPM

- Gears forward 3-8 and

Reverse 2-4 ..... 160 hp (119 kW)

Torque @ 1500 RPM ..... 590 lb.ft (800 N.m)

Torque rise (Net) ..... 49.8%

### All Wheel Drive Engaged

Rated gross brake horsepower @ 2200 RPM

- All gears ..... 174 hp (130 kW)

Rated net brake horsepower @ 2200 RPM

- All gears ..... 160 hp (119 kW)

Torque @ 1500 RPM ..... 590 lb.ft (800 N.m)

Torque rise (Net) ..... 49.8%

Engine equipped with a two stage, dual element, dry type air cleaner with evacuator and dash mounted service indicator. 24 volt starting and electrical system with 50 amp (1200 watt) alternator with internal voltage regulator. Two heavy duty 12 volt maintenance free batteries with 625 cold cranking amps (CCA) and 180 minutes reserve capacity per battery. 900 CCA batteries available optionally. System includes battery disconnect.

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



## TRANSMISSION

Make/Model ..... Volvo 8400  
Fully sequential, direct drive, powershift transmission. Engine cannot be started if transmission is in gear. Single lever transmission controller provides electronic self diagnostics. The flywheel mounted, multi-disc master clutch is oil cooled for long life.

Ground speeds at 2200 RPM with standard tires:

Forward		Reverse			
Gears	mph	km/h	Gears	mph	km/h
1	2.4	3,8	1	2.4	3,8
2	3.4	5,4			
3	4.6	7,4	2	4.6	7,4
4	6.5	10,4			
5	9.2	14,7	3	9.2	14,7
6	12.8	20,5			
7	17.8	28,5	4	17.8	28,5
8	24.9	39,8			

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



## DIFFERENTIAL / FINAL DRIVE

Make/Model ..... Volvo SR30  
Single reduction final drive with an operator controlled lock/unlock differential. Rear axles are case hardened, supported on double row spherical roller bearings.



## TANDEMS

Oscillating tandem case has 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	1.75"	(44 mm)
Oscillation	± 15°	



## BRAKES

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

Parking Brake ..... Hand operated  
Independent, disc type hand 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.

Braking systems 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 ..... 13:00 x 24, G-2  
Ply rating (PR) ..... 12  
Rim size ..... 8.0" (203 mm)  
Bolt-on rims are not interchangeable between the front wheels and the tandem wheels.



## FRONT AXLE

Type ..... Fully welded steel truss, gusseted for torsional strength, oscillates on a single 3.5" (89 mm) diameter center pivot pin

Wheel lean ..... 15° R & L

Oscillation ..... 16° up and down

Ground clearance ..... 23.5" (597 mm)

Two 3" (76 mm) diameter wheel lean cylinders with lock valve are standard equipment.



## ALL WHEEL DRIVE

Completely independent from the main hydraulic system, the Volvo High Torque All Wheel Drive system incorporates two variable displacement, closed loop piston pumps, and a separate reservoir, oil cooler and filter. The system eliminates potential fluid cross contamination. 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.

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 ..... 17.7 mph (28,6 km/h)

Creep Mode speed ..... 0-2 mph (0-3,2 km/h)

Maximum rim pull ..... 7,500 lb (3 402 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 17.7 mph (28,6 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.

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 in low speeds
- Maintains front wheel aggression in turns
- One speed sensor at each front wheel
- Hydrostatic Creep Mode feature



## STEERING

Hydraulic power front wheel steering incorporating two steering cylinders. Meets SAE J1511 OCT. 90 with optional supplemental steering.

Minimum turning radius using front axle steering, articulation, wheel lean and unlocked differential ..... 24'3" (7 391 mm)

Steering arc ..... 72°

Frame articulation angle ..... 22°

Articulation lock standard



## FRAME

Full front and rear frame sections

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

Minimum dimensions of box section ..... 10.5" x 14.0" (267 mm x 356 mm)

Plate thickness ..... 0.75" (19 mm)

Vertical section modulus at arch ..... 119 cu in (1 950 cm<sup>3</sup>)

minimum ..... 101.5 cu in (1 663 cm<sup>3</sup>)

maximum ..... 212 cu in (3 474 cm<sup>3</sup>)

Linear weight minimum-maximum ..... 107.1 - 232.5 lb/ft (159.4 - 346.0 kg/m)

**Rear:** Full rear frame permits modular powertrain mounting for ease of service and simplifies attachment mounting.

Minimum dimensions of rear frame ..... 4.0" x 10.0" (102 mm x 254 mm)

Plate thickness ..... 0.375" (9.5 mm)



## ARTICULATION

Twin 4.5" (114 mm) hydraulic cylinders articulate frame 22° right and left. Anti-drift lock valve



## CIRCLE

Hardened teeth, cut on the outside of the circle for maximum leverage and minimum wear. Circle is fabricated from high tensile steel and all running surfaces are precision machined.

The circle is held positively in place at six points by three adjustable clamp plates and three adjustable guide shoes, providing optimum circle support and load distribution. The primary set of clamps and guide shoes is located at the front of the circle where greatest loading occurs. DURAMIDE™ faced clamp and guide shoes prevent metal-to-metal contact and provide maximum service life.

DURAMIDE™ is a synthetic bearing material that maximizes 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



## CIRCLE DRIVE

The Volvo dual cylinder circle drive system uses direct acting hydraulic power for exceptional turning and holding capability under full load. The circle drive system uses hardened drive pinions and is fully protected against impact damage by an overload cushion 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 6.50" (165 mm x 165 mm)

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



## MOLDBOARD

Standard moldboard with replaceable end bits ..... 12' x 25" x 7/8" (3 658 mm x 635 mm x 22 mm)

Blade material ..... SAE 1050 high carbon steel

Edge: through hardened ..... 6" x 5/8" boron steel (152 mm x 16 mm)

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

- drill size ..... 5/8" (16 mm)

Slide rails supported with DURAMIDE™ bearings.



## BLADE RANGE: MOVEABLE BLADE CONTROL SYSTEM

(Dimensions shown with standard moldboard)

	LEFT	RIGHT
Reach outside tires - articulated frame	119.5" (3 035 mm)	120.5" (3 061 mm)
Reach outside tires - straight frame	79.5" (2 019 mm)	80.5" (2 045 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" (432 mm)	
Blade cutting depth	32.5" (826 mm)	
Blade tilt range	47° forward	5° back

Superior blade mobility permits steep ditch cutting angles and back sloping without putting the front tire on the slope.



## CAB & CONTROLS



All controls and gauges are housed in the fully adjustable steering pedestal and right hand console. Located in the pedestal head are the engine oil pressure, coolant temperature and fuel level gauges, transmission gear indicator and a three level electronic monitoring display. Pedestal located switches include: differential lock/unlock, independent moldboard floats (optional) and combination turn signal, hazard lights, and high beam headlight switch. Heater and wiper/washer controls, 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 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) are standard. Interior operator noise level ranges from 78 to 81 dB(A) per ISO 6394 (enclosed cab).

### CAB OPTIONS

- High capacity heater/air conditioner c/w adjustable vents, temperature control and 3 speed fan
- Fully adjustable, suspension seat
- Lower opening vent windows
- Rear windshield wipers and washers
- Lower front window wipers and washers
- Modular, 24 volt radio and cassette player with remote control
- Operator Convenience Package (lunch box, steel vacuum bottle and holder, ashtray)
- 24 volt to 12 volt convertor for electrical accessories or two way radio installations

### 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 2" (51 mm) wide and meets SAE J386 JUNE 93; ISO 6683-1981(E). A cushioned vinyl covered bucket seat with fore & aft and height adjustment is standard.



## LOAD SENSING HYDRAULICS

Closed center hydraulic system senses load requirements and maintains system pressure 250 psi (17,25 Bar) above the load pressure.

When hydraulic pressure is not required, system pressure is only 90 psi (6,2 Bar).

System features industry standard control arrangement c/w 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, articulation and scarifier (optional). All hoses and fittings are equipped with o-ring seals.

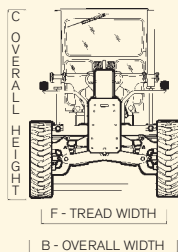
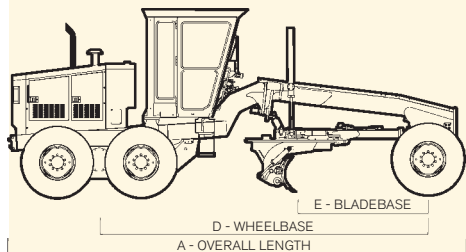
Pump design features include cast iron end covers and center housing, and one piece gear and shaft assembly to ensure reliability and long service life.

Maximum pressure ..... 2,500 psi (172 Bar)

Output at 2200 RPM ..... 0-50.5 gpm (0-191 lpm)

Filtration ..... 7 micron spin-on type

## DIMENSIONS



A Overall length ..... 97'9" (2 978 mm)

B Overall width ..... 8'7" (2 668 mm)

C Overall height ..... 11'1" (3 378 mm)

- with Low Profile Cab ..... 10'1" (3 073 mm)

D Wheelbase ..... 20'0" (6 096 mm)

E Bladebase - ISO 7134 ..... 8'7" (2 616 mm)

F Tread width ..... 6'10" (1 853 mm)



## CAPACITIES

	U.S.Gal.	Imp.Gal.	Litres
Fuel tank .....	100.0	83.3	378.5
Transmission .....	10.0	8.4	38.0
Final drive .....	6.0	5.0	23.0
Tandems (each) .....	26.4	22.0	100.0
Hydraulic oil tank .....	23.8	19.8	90.0
AWD hydraulic oil .....	20.0	17.0	76.0
Coolant antifreeze protection to -58° F (-50° C) approx .....	12.4	10.3	47.0
Engine oil .....	3.8	3.2	14.0



## ATTACHMENTS

"A" Frame .....	850 lb	(386 kg)
<b>SNOW</b>		
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)
Snow Wing		
- rear mounted .....	3,100 lb	(1 407 kg)
"V" Snow Plow		
- 9' (2 743 mm) .....	2,500 lb	(1 134 kg)
- 10' (3 042 mm) .....	2,650 lb	(1 202 kg)
<b>EARTH</b>		
Dozer Blade		
- 8' (2 438 mm) .....	1,600 lb	(725 kg)
- 9' (2 743 mm) .....	1,650 lb	(748 kg)
Push Block .....	1,050 lb	(476 kg)
Ripper/Scarifier, rear .....	2,680 lb	(1 215 kg)
Scarifier with 11 teeth .....	1,725 lb	(782 kg)
Windrow Eliminator .....	1,300 lb	(590 kg)

## STANDARD FEATURES

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

Hand operated park brake with operator warning alarm and indicator

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

13.5" (343 mm) diameter, 4 plate, full oil master clutch

Moveable blade control system for optimum blade mobility

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

Circle drive cushion valve protects circle drive against impact damage

Hardened circle teeth cut on outside of circle for maximum turning power

Hardened circle drive pinions for maximum wear resistance

## STANDARD FEATURES

(continued)

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

Adjustable steering control pedestal with tilt head for maximum operator comfort

Gauges include: coolant temperature, engine oil pressure, fuel, hourmeter, dash mounted air cleaner service indicator, articulation angle indicator, three level electronic monitoring system - M4 - 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.

Feathering type controls for precise blade adjustments

100 gallon fuel capacity

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

Hinged radiator guard for easy trash clean out

Backup lights

Backup alarm with automatic volume levels

Painted High Gloss Volvo Yellow and Gray

Lockable tool box with storage space for scarifier shanks

Engine side panels c/w locks

Left and right outside rear view mirrors

## OPTIONAL EQUIPMENT

	lb	Kg
Accumulators - blade lift (2) .....	130	59
Air conditioner - 29,000 BTU		
-HFC-134a (non-CFC refrigerant) .....	130	59
Brush guards .....	40	18
Cab		
- canopy shell with ROPS - deduct ... (200)	(91)	
- FOPS protection for ROPS cabs .....	220	100
- Low Profile Cab		
with ROPS - deduct .....	(200)	(91)
Cab heater - 49,000 BTU - with cab		
pressurizer and replaceable filter .....	30	14
Defroster fans .....	3	1
Engine block heater .....	3	1
Engine precleaner - Turbo II .....	6	3
Exhaust aspirated precleaner .....	6	3
Ether cold start .....	10	4
Exhaust rain cap .....	-	-
First user lifetime frame warranty .....	0	0
Float control - Right and Left		
independent, electric .....	15	7
Hydraulic manifold cover .....	10	4
Hydraulic tank heater .....	3	1
24 volt radio/cassette player .....	6	3
Lights		
- Beacon (amber or blue) .....	10	4
- Clearance lights front & rear .....	2	1
- Front mounted plow lights - 2		
- High .....	120	54
- Low .....	100	45

## OPTIONAL EQUIPMENT

(continued)

	lb	Kg
- Headlights with dimmer switch .....	0	0
- Moldboards lights - 2 .....	2	1
- Rear flood lights - 2 .....	2	1
- Snow wing lights - 2 .....	2	1
Machine Monitor Plus package - M044	0	0
(Audible and visual warnings for transmission and hydraulic filter restriction, low engine oil pressure, high coolant temperature, high transmission temperature, and low transmission clutch pressure)		
Moldboards		
- 14' x 25" x 7/8"		
(4 267 mm x 635 mm x 22 mm) .....	280	127
Moldboard extensions		
R & L - 2' (610 mm) .....	200	91
Moldboard edges - Carbide 3/4" x 5" .....	-	-
Operator convenience package		
- lunch box, steel vacuum bottle		
and holder, ashtray .....	10	5
Paint - custom colors .....	-	-
Polar protection .....	0	0
Radiator shutters - hinged .....	10	4
Reflectors - rear .....	-	-
Remote lube manifold for articulation		
cylinders .....	0	0
Remote valve for attachments		
- 3 or 5 bank - remote mount .....	25	11
Second leaning wheel cylinder		
- right side .....	25	11
70 amp alternator .....	0	0
Rim locks included with 3 piece rims .....	0	0
Sideshift accumulator .....	45	20
Supplemental steering (power assisted)		
meets SAE J53 OCT84 .....	61	28
Suspension seat .....	55	25
Tie down brackets .....	100	45
Tires		
- 14:00 x 24, 12 PR, G-2,		
10" (254 mm) rims .....	450	204
- 15.5 x 25, 12 PR, G-2,		
13" (330 mm) rims .....	840	381
- 17.5 x 25, 12 PR, G-2,		
14" (356 mm) rims .....	1,032	468
Tool kit .....	-	-
Transmission sump heater .....	-	-
Tropical protection .....	-	-
Vandalism protection .....	8	4
Wheel weights for rear		
wheels only - each .....	250	113
Window - opening - lower front .....	-	-
Window - opening sliders - left/right .....	-	-
Wiper and washer - front .....	-	-
Wiper and washer - rear .....	-	-
Wiper and washer - lower front .....	-	-

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# VOLVO

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