

# The Volvo L90E in detail

## Engine

Engine: 6 liter, 6-cylinder straight turbo-charged diesel engine with electronically controlled unit pumps and conventional injectors. The engine is of heavy-duty type with dry replaceable cylinder liners and replaceable valve guides and valve seats. The throttle application is transmitted electrically from the throttle pedal and eventual hand throttle. Air cleaning: three-stage. Cooling system: Hydrostatic, electronically controlled fan and intercooler of the air/air type.

Engine..... Volvo D6D LA E2  
 Max power at..... 32,0 r/s (1900 r/min)  
 SAE J1995 gross..... 122 kW (166 hp)  
 ISO 9249, SAE J1349..... 121 kW (165 hp)  
 Max torque at..... 23,3 r/s (1400 r/min)  
 SAE J1995 gross..... 739 Nm  
 ISO 9249, SAE J1349..... 732 Nm  
 Economic working range..... 1100–1600 r/min  
 Displacement..... 5,7 l

## Drivetrain

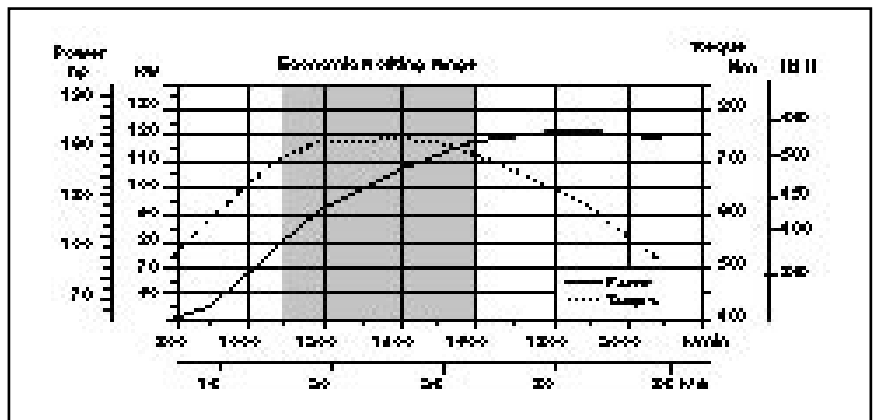
Torque converter: single-stage. Transmission: Volvo Countershaft-type transmission with single lever control. Fast and smooth shifting of gears between forward and reverse with PWM-valves (Pulse Width Modulated). Gearshifting system: Volvo Automatic Power Shift (APS) with mode selector. Axles: Volvo, fully floating axle shafts with planetary-type hub reductions. Cast steel axle housing. Fixed front axle and oscillating rear axle. 100% differential lock on the front axle.

Transmission..... Volvo HTE 202  
 Torque multiplication..... 2,45:1  
 Maximum speed, forward/reverse  
 1..... 6,8 km/h  
 2..... 12,7 km/h  
 3..... 25,6 km/h  
 4..... 37,1 km/h  
 Measured with tires..... 20.5 R25 L2  
 Front axle/rear axle..... Volvo/AWB 25/20  
 Rear axle oscillation.....  $\pm 13^\circ$   
 Ground clearance at  $13^\circ$  oscillation..... 470 mm

## Brake system

Service brake: Volvo dual-circuit system with nitrogen-charged accumulators. Outboard mounted fully hydraulic operated, fully sealed oil circulation cooled wet disc brakes. The operator can select automatic declutch of the transmission when braking by a switch on the instrument panel. Parking brake: Fully sealed, wet multi-disc brake built into the transmission. Applied by spring force, electro-hydraulic release with a switch on the instrument panel. Secondary brake: Dual brake circuits with rechargeable accumulators. One circuit or the parking brake fulfill all safety requirements. Standard: The brake system complies with the requirements of ISO 3450.

Number of brake discs per wheel front/rear..... 1/1  
 Accumulators..... 1x1,0 l and 2x0,5 l  
 Accumulator for parking brake..... 1x1,0 l



## Steering system

Steering system: Load-sensing hydrostatic articulated steering. System supply: The steering system has priority feed from a load-sensing axial piston pump. Pump: Axial piston pump with variable displacement. Steering cylinders: Two double-acting cylinders.

Steering cylinders..... 2  
 Cylinder bore..... 80 mm  
 Piston rod diameter..... 50 mm  
 Stroke..... 345 mm  
 Relief pressure..... 21 MPa  
 Maximum flow..... 200 l/min  
 Maximum articulation.....  $\pm 40^\circ$

## Cab

Instrumentation: All important information is centrally located in the operator's field of vision. Display for Contronic monitoring system. Heater and defroster: Heater coil with filtered fresh air and fan with four speeds. Defroster vents for all window areas. Operator's seat: Operator's seat with adjustable suspension and retractable seatbelt. The seat is mounted on a bracket on the rear cab wall. The forces from the retractable seatbelt are absorbed by the seat rails. Standard: The cab is tested and approved according to ROPS (ISO/CD 3471, SAE J1040), FOPS (ISO 3449). The cab meets with requirements according to ISO 6055 ("protective roof for high-lift vehicles") and SAE J386 ("Operator Restraint System").

Emergency exits..... 1  
 Sound level in cab according to ISO 6396..... LpA 70 dB (A)  
 External sound level according to ISO 6395..... LwA 105 dB (A) (Directive 2000/14/EC)  
 Ventilation..... 9 m<sup>3</sup>/min  
 Heating capacity..... 11 kW  
 Air conditioning (optional)..... 8 kW

## Hydraulic system

System supply: Two load-sensing axial piston pumps with variable displacement. The steering function always has priority from one of the pumps. Valves: Double-acting 2-spool valve. The main valve is controlled by a 2-spool pilot valve. Lift function: The valve has four positions; raise, hold, lower and float position. Inductive/magnetic automatic boom kickout can be switched on and off and is adjustable to any position between maximum reach and full lifting height. Tilt function: The valve has three functions; roll-back, hold and dump. Inductive/magnetic automatic tilt can be adjusted to the desired bucket angle. Cylinders: Double-acting cylinders for all functions. Filter: Full flow filtration through 20 micron (absolute) filter cartridge.

Working pressure, pump..... 26,0 MPa  
 Flow..... 175 l/min  
 at..... 10 MPa  
 and engine speed..... 32 r/s (1900 r/min)  
 Pilot system  
 Working pressure..... 3,5 MPa  
 Cycle times  
 Raise\*..... 5,4 s  
 Tilt\*..... 2,1 s  
 Lower, empty..... 2,5 s  
 Total cycle time..... 10,0 s

\* with load as per ISO 5998 and SAE J818

## Lift arm system

Torque parallel linkage with high breakout torque and exact parallel lift-arm action.

Lift cylinders..... 2  
 Cylinder bore..... 120 mm  
 Piston rod diameter..... 70 mm  
 Stroke..... 733 mm  
 Tilt cylinder..... 1  
 Cylinder bore..... 180 mm  
 Piston rod diameter..... 90 mm  
 Stroke..... 430 mm



### Electrical system

Central warning system: Central warning light for the following functions, (buzzer with gear engaged): Engine oil pressure, transmission oil pressure, brake pressure, parking brake, hydraulic oil level, axle oil temperature, steering system pressure, low coolant level, coolant temperature, transmission oil temperature, hydraulic oil temperature, over-speeding in engaged gear, brake charging.

Voltage..... 24 V  
 Batteries.....2x12 V  
 Battery capacity.....2x110 Ah  
 Cold cranking capacity, approx..... 690 A  
 Reserve capacity, approx..... 206 min  
 Alternator rating..... 1540 W/55 A  
 Starter motor output..... 5,4 kW(7,3 hp)

### Service

Service accessibility: Large, easy-to-open service doors with gas springs. Swing-out radiator grille and fan. Possibility to log and analyze data to facilitate troubleshooting.

#### Refill capacities

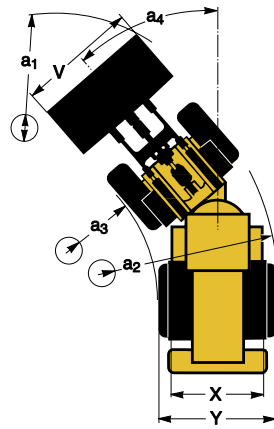
Fuel tank..... 205 l  
 Engine coolant.....36 l  
 Hydraulic oil tank..... 115 l  
 Transmission oil .....40 l  
 Engine oil .....20 l  
 Axles front/rear ..... 30/25

# Specifications

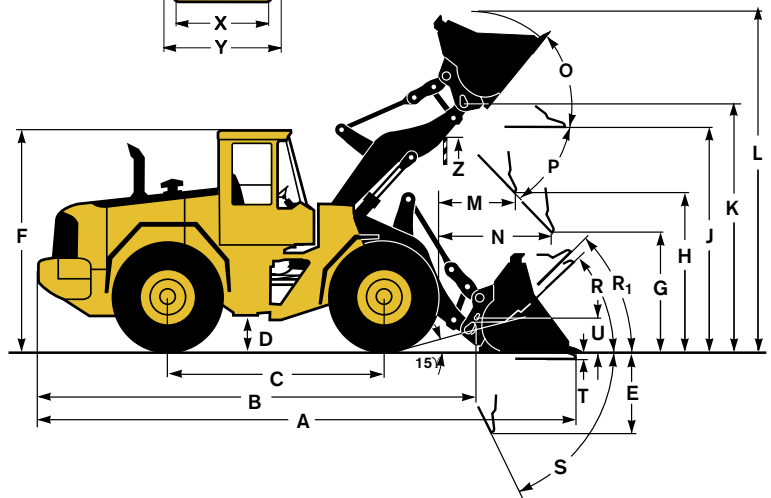
## Tires: 20.5 R25

Standard boom	
B	6 020 mm
C	3 000 mm
D	400 mm
F	3 260 mm
G	2 132 mm
J	3 650 mm
K	3 960 mm
O	56 °
P <sub>max</sub>	45 °
R	44 °
R <sub>1</sub> *	47 °
S	67 °
T	112 mm
U	430 mm
X	1 960 mm
Y	2 490 mm
Z	3 260 mm
a <sub>2</sub>	5 410 mm
a <sub>3</sub>	2 830 mm
a <sub>4</sub>	±40 °

\* Carry position SAE



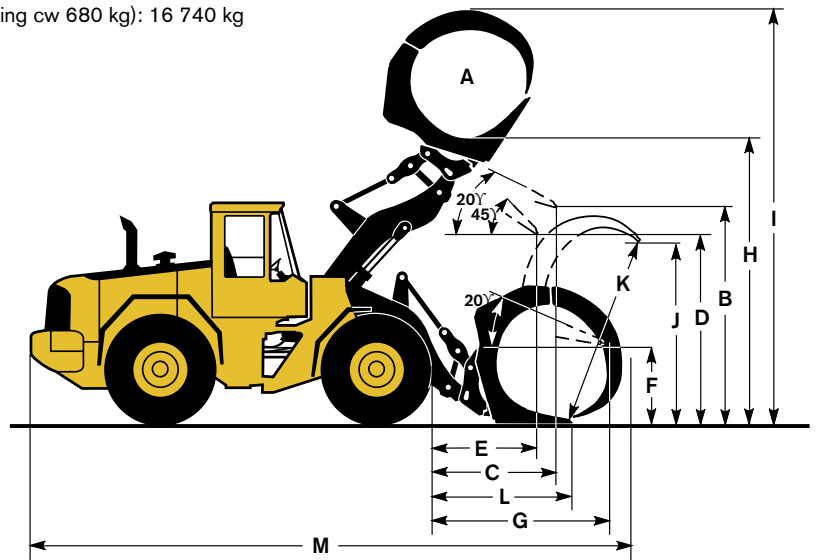
Where applicable, specifications and dimensions are in accordance with ISO 7131, SAE J732, ISO 7546, SAE J742, ISO 5998, SAE J818, ISO 8313.



## Tires: 650/65 R25











A	2,4	m <sup>2</sup>
B	3 420	mm
C	1 810	mm
D	2 800	mm
E	1 430	mm
F	1 450	mm
G	2 750	mm
H	4 530	mm
I	6 580	mm
J	2 790	mm
K	2 990	mm
L	2 130	mm
M	8 320	mm

Operating weight (incl. logging cw 680 kg): 16 740 kg  
Operating load: 4 600 kg



## SUPPLEMENTAL OPERATING DATA

Tires 20.5 R25		650/65 R25
Width over tires	mm	+200
Ground clearance	mm	+10
Tipping load, full turn	kg	+320
Operating weight	kg	+550






Tires 20.5 R25 L2	GENERAL PURPOSE								LIGHT MTRL		
											
Volume, heaped ISO/SAE	m <sup>3</sup>	2,3	2,4	2,5	2,5	2,6	2,5	2,7	2,7	4,1	7,0
Volume at 110% fill factor	m <sup>3</sup>	2,5	2,6	2,8	2,8	2,9	2,8	3,0	3,0	4,5	7,7
Static tipping load, straight	kg	10 830	11 460	10 650	11 400	10 680	10 850	10 560	11 230	10 260	9 970
at 35° turn	kg	9 600	10 190	9 430	10 140	9 450	9 610	9 340	9 970	9 060	8 750
at full turn	kg	9 240	9 810	9 070	9 760	9 090	9 250	8 980	9 600	8 700	8 390
Breakout force	kN	114,1	125,3	109,5	115,6	107,4	113,2	105,4	113,6	84,9	73,4
A	mm	7 440	7 530	7 500	7 640	7 530	7 690	7 560	7 470	7 890	8 190
E	mm	1 190	1 280	1 250	1 370	1 270	1 410	1 300	1 210	1 590	1 860
H <sup>***</sup> )	mm	2 820	2 770	2 780	2 700	2 770	2 670	2 750	2 810	2 540	2 340
L	mm	5 370	5 370	5 420	5 390	5 450	5 450	5 480	5 420	5 550	5 750
M <sup>***</sup> )	mm	1 130	1 220	1 170	1 290	1 190	1 310	1 210	1 130	1 470	1 680
N	mm	1 700	1 750	1 710	1 780	1 720	1 780	1 730	1 690	1 740	1 730
V	mm	2 650	2 650	2 650	2 650	2 650	2 650	2 750	2 750	2 750	3 000
a <sub>1</sub> clearance circle	mm	11 850	11 910	11 880	11 970	11 900	11 980	12 000	11 960	12 190	12 590
Operating weight	kg	15 340	15100	15 380	15 130	15 420	15 360	15 510	15 160	15 630	16 060

\*\*\*Measured to the tip of the bucket teeth or bolt-on edge. Dump height to bucket edge (acc. SAE) + approx. 200mm. Measured at 45° dump angle.

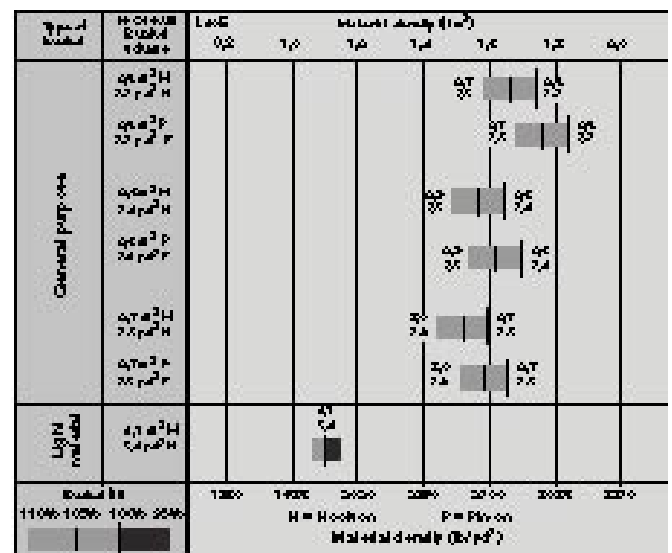
Note: This only applies to Volvo original attachments.

## BUCKET SELECTION CHART

The choice of bucket is determined by the density of the material and the expected bucket fill factor. The actual bucket volume is often larger than the rated capacity, due to the TP Linkage features: • Open bucket design. • Very good roll back in all positions. • Good bucket fill performance. **Example: Sand and gravel.** Fill factor ~ 105%. Density 1,65 t/m<sup>3</sup>. Result: The 2,7 m<sup>3</sup> bucket carries 2,8 m<sup>3</sup>. For optimum stability always consult the bucket selection chart.

Material	Bucket fill, %		Material density, t/m <sup>3</sup>	ISO/SAE bucket volume, m <sup>3</sup>	Actual volume, m <sup>3</sup>
Earth/Clay	~ 110		~ 1,80	2,5	~ 2,7
			~ 1,70	2,6	~ 2,9
			~ 1,65	2,7	~ 3,0
Sand/Gravel	~ 105		~ 1,80	2,5	~ 2,6
			~ 1,70	2,6	~ 2,7
			~ 1,65	2,7	~ 2,8
Aggregate	~ 100		~ 1,80	2,5	~ 2,5
			~ 1,70	2,6	~ 2,6
			~ 1,65	2,7	~ 2,7
Rock	≤100		~ 1,80	2,2	~ 2,2

The size of rock buckets is optimized for optimal penetration and filling capability rather than the density of the material.



## STANDARD EQUIPMENT

### Engine

Three stage air cleaner with ejector and inner filter  
Indicator glass for coolant level  
Preheating of induction air  
Muffler, spark arresting  
Fuel filter  
Oil trap

### Electrical system

24 V, prewired for optional accessories

Alternator, 24 V/55 A

Battery disconnect switch

Fuel gauge

Hour meter

Electric horn

Instrument panel with symbols

Lighting:

- Twin halogen front headlights with high and low beams
- Parking lights
- Double brake and tail lights
- Turn signals with flashing hazard light function
- Halogen working lights (2 front and 2 rear)
- Instrument lighting

### Contronic,

monitoring system, ECU

with log and analysis system

Contronic display

Fuel consumption

Outdoor temperature

Engine shutdown to idle (selectable) for

- High engine coolant temperature
- Low engine oil pressure
- High transmission oil temperature

Start interlock when gear is engaged

Brake test

Test function for warning and indicator lights

Warning and indicator lights for:

- Charging
- Oil pressure engine

- Oil pressure, transmission
- Brake pressure
- Parking brake
- Hydraulic oil level
- Axle oil temperature
- Primary steering
- Secondary steering
- High beams
- Turn signals
- Rotating beacon
- Preheating coil
- Differential lock
- Coolant temperature
- Transmission oil temperature
- Brake charging
- Level warnings:
  - Coolant level
  - Hydraulic oil level
  - Washer fluid level

### Drivetrain

Automatic Power Shift with operator-controlled  
de clutch function for transmission cut-out when  
braking

PWM-control between different gear positions

Forward and reverse switch by lever console

Differentials:

front: 100% hydraulic diff lock

rear: conventional

### Brake system

Wet oil circulation cooled disc brakes on all four  
wheels, outboard mounted

Dual brake circuits, front and rear

Dual service brake pedals

Secondary brake system

Parking brake, el-hydraulic

Brake wear indicator

### Cab

ROPS (SAE J1040CC, ISO 3471), FOPS (SAE  
J231, ISO 3449)

Single key kit door/start

Acoustic inner lining

Ashtray

Cigarette lighter

Lockable door

Cab heating with filter, fresh-air inlet and defroster

Floor mat

Interior lights

Interior rear-view mirror

2 exterior rear-view mirrors

Window right-hand side, openable

Tinted safety glass

Hip retractable seatbelt (SAE J386)

Adjustable lever console

Ergonomically designed operator's seat with adjust-  
able suspension

Storage compartment

Sun visor

Beverage holder

Windshield washers front and rear

Windshield wipers front and rear

Interval function for front and rear windshield wipers

Service platforms with anti-slip surfaces on front and  
rear fenders

Speedometer

### Hydraulic system

Main valve, 2-spool

Pilot valve, 2-spool

Variable displacement axial piston pumps (2) for:

- working hydraulics
- steering system, pilot hydraulics and brakes
- fan motor

Boom lowering system (float)

Boom lever detent, adjustable

Boom kickout, automatic, adjustable

Bucket positioner, automatic with position indicator,  
adjustable

Hydraulic oil cooler

### External equipment

Noise and vibration dampening suspension of cab,  
engine and transmission

Lifting lugs

Easy-to-open side panels and engine hood

Frame steering, joint lock

Vandalism lock prepared for batteries and engine oil

Towing hitch

## OPTIONAL EQUIPMENT

(Standard on certain markets)

### Service and maintenance

Tool box

Tool kit

Automatic lubrication

Automatic lubrication of attachment bracket

Refill pump for auto lub system

Wheel nut wrench kit

### Engine equipment

Engine block heater

Oil bath pre-cleaner

Turbo air cleaner

Radiator and hydraulic oil cooler, corrosion prot.

Hand-operated throttle

Fuel fill strainer

Coolant filter

Sy-klone pre cleaner

### Electrical system

Air filter for alternator

Alternator, 80 A

Attachment working lights

Extra working lights front

Extra working lights rear

Light, license plate

Assymetrical lights for left-hand traffic

Acoustic back-up signal

Rotating beacon, collapsible

Indicator lamps

Reverse light

Working lights, on cab, dual

### Cab

Radio with tape recorder

Radio with CD

Installation kit for radio

Sunblinds, front and rear windows

Sunblinds, side windows

Sliding window, right

Sliding window, door

Retractable seatbelt, longer and wider than standard

Air conditioning

Ventilation air filter for work in asbestos environment

Operator's seat with low backrest

Operator's seat with low backrest, heated

Operator's seat with high backrest, heated

Operator's seat air suspended with high backrest  
and electrical heating

Instructor's seat

Armrest (left) for ISRI operator seat

Lunchbox holder

Steering knob

Noise reduction kit

Rear view camera

Adjustable steering wheel

Automatic temp control (ATC)

Corrosion protected condenser

### Drivetrain

Diff lock front 100%, limited slip rear

Speed limiter 20 km/h, 30 km/h

### Brake system

Audible parking brake alarm

### Hydraulic system

Single lever control

Single lever control for 3rd hydraulic function

3rd hydraulic function

3rd-4th hydraulic function

Detent 3rd function

Boom Suspension System

Biodegradable hydraulic fluid

Attachment bracket, cast, visibility optimized

Arctic kit, attachment locking hoses

Arctic kit, pilot hoses and brake accum.

Separate attachment locking

### External equipment

Mudguards, full coverage for 650/65 R25

Mudflap kit for mudguards

Logging counterweight

### Protective equipment

Guards for front headlights

Guards for taillights

Guards for side windows and rear window

Windshield guard

Bellyguard front and rear

Cover plates, rear frame

### Other equipment

Comfort Drive Control, CDC

Secondary steering

Sign, slow moving vehicle

Single acting lifting function

Sign 50 km/h

Noise reduction kit EU

CE-marking

### Tires

20.5 R25

650/65 R25

### Attachments

Buckets:

- Straight with/without teeth
- Spade nose with/without teeth

- High tipping
- Light materials

Bolt-on and weld-on bucket teeth

Cutting edge in three sections, bolt-on

Bucket spill guard

Fork equipment

Material handling arm

Log grapples





**Boom Suspension System (BSS)\***

Gas/oil accumulators connected to the lift cylinders effectively absorb shocks, reduce bouncing and rocking that often arise when running over rough ground. Boom Suspension System gives faster cycle times, less material spill and improved operator comfort.



**Comfort Drive Control\***

Significant reduction of repetitive and tiring steering wheel movements with CDC. Comfortable operation of steering and shifting with user-friendly controls in the left armrest.



**Hydraulic function\***

The hydraulic system in the L90E is prepared for installation of a third hydraulic function. The separate third hydraulic function with its control lever and additional lines can easily be installed to further increase the loader's flexibility.

L90E can also be equipped with a fourth hydraulic function which is operated with a fourth control lever. This function is necessary when there's a need for a third and fourth hydraulic function at the same time, such as when using a sweeper attachment, foldable snowplow and log grapple with heel kick-out.



**Central lubrication\***

Volvo's factory-mounted central lubrication system, for automatic lubrication of service points on the machine. This means less time for maintenance and more time for productive work.



**Genuine Volvo attachments**

Genuine Volvo attachments are designed and manufactured for optimal fit and use of the TP-linkage, which makes the L90E a fast and effective machine in a wide range of applications.

They can also be used with earlier models.

\*Optional equipment



## Technology on Human Terms

Volvo Construction Equipment is one of the world's leading manufacturers of construction machines, with a product range encompassing wheel loaders, excavators, articulated haulers, motor graders and more.

The tasks they face vary considerably, but they all share one vital feature: technology which helps man to perform better: safely, efficiently and with care of the environment. We refer to it as Technology on Human Terms.

The sheer width of the product range means it is always possible to choose exactly the right machine and attachment for the job. Each machine also comes with the quality, continuity and security which is represented by the Volvo

name. The strength of the service and parts organizations; the security of always having immediate access to leading-edge research and technical development are part of the Volvo name. A machine from Volvo meets the very highest demands in all kinds of jobs, under all conditions, the world over.

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# VOLVO

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