

Service.



Self-Study Programme 251

The Passat, Model Year 2001



The Passat, Model Year 2001



This Self-Study Programme summarises the design features of the Passat 2001. It provides you with information about the various engines and gearboxes, the front and rear axle configurations, the electronics and the modifications to the convenience system. The design and function of the various components and modules will not be explained in depth in this SSP.

Descriptions of modifications always refer to the predecessor model. A number of the technologies cited in this Self-Study Programme

have previously been described in other Self-Study Programmes. To enable you to brush up your knowledge of specific technologies, we have enclosed an index at the back of this SSP. It refers you to the relevant Self-Study Programmes by keywords such as "TUMBLE INTAKE PORT". (In the case of the "tumble intake port" you are referred to SSP 195 - the SSP in which this technical feature is described.)



Keywords are always given in **SMALL CAPITALS**.

New



Important Note



The Self-Study Programme presents the design and function of new developments.
The contents are not updated!

Please always refer to the relevant Service literature for current inspection, adjustment and repair instructions.



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Concisely



Saloon

Brief description of vehicle

The Passat 2001 is based on the highly successful predecessor model. In revising the vehicle, Volkswagen's designers retained the characteristic basic shape of the saloon, with its distinctive dome roof.

The front end of the Passat has been redesigned, and particularly the bonnet, the wings and the radiator grille. The bumpers now have full-length rubbing strips.

New features of the Passat, model year 2001

- 
- Dynamic navigation
 - TV tuner
 - Third-generation immobiliser
 - Anti-vibration measures (40Hz body)



The rear end has been revised also, including the rear lights.

- Solar roof

The headlights have clear lenses and the indicator lights are built into the headlights. BI-xenon headlights with dynamic headlight range control are also available.



- Improved crash concept

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Concisely



Variant

The Variant has been revised, too. In addition to the new front-end design, which is identical in the Variant and saloon, the rear end and the rear lights have been redesigned in the Variant.



- New locking concept with radio wave folding key (fob) built into the driver's door.



The Passat has a new locking concept. All models come with radio wave folding keys. There is no lock cylinder on the front passenger's door and the tailgate is separately released.

- Comfort-enhanced air conditioning system

- Distance control

- Spare wheel fitted with ready-for-road tyre

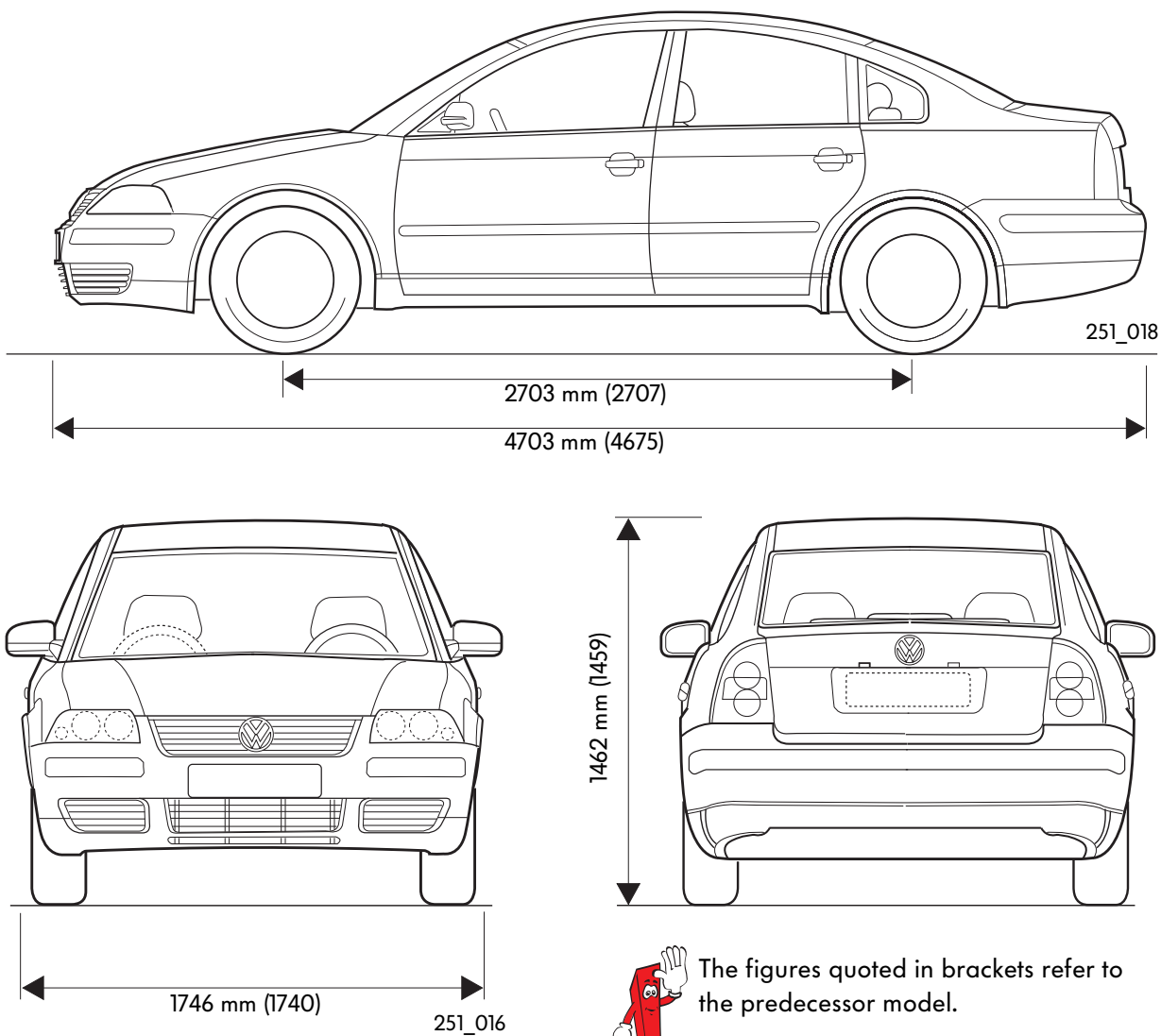
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All technical modifications apply to saloon and Variant.



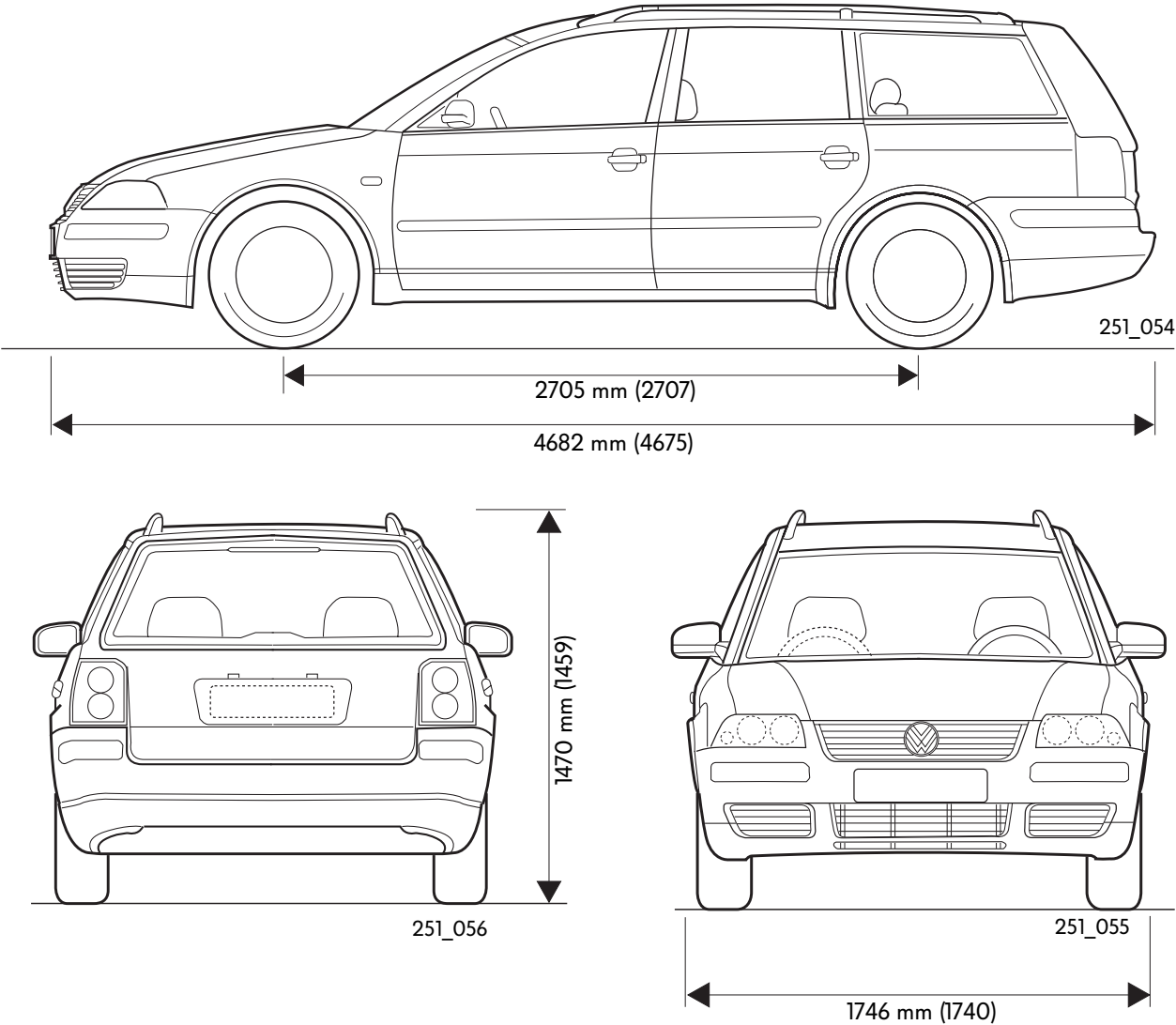
Saloon



Dimensions and weights

Model	MY 2001	MY 1997
Length	4703 mm	4675 mm
Width	1746 mm	1740 mm
Height	1462 mm	1459 mm
Wheelbase	2703 mm	2707 mm
Turning circle	11.4 m	11.4 m
Tank capacity	62 l	62 l
Drag coefficient	0.27 c _w	0.27 c _w
Weight (unladen)	1277 kg	1233 kg

Variant



Dimensions and weights

Model	MY 2001	MY 1997
Length	4682 mm	4675 mm
Width	1746 mm	1740 mm
Height	1470 mm	1459 mm
Wheelbase	2705 mm	2707 mm
Turning circle	11.4 m	11.4 m
Tank capacity	62 l	62 l
Drag coefficient	0.27 c _w	0.27 c _w
Weight (unladen)	1319 kg	1282 kg

Environmental Protection

The water management plan

Environmental protection is a matter of fundamental importance. Each and everyone of us should strive to protect the environment wherever possible, day by day. You are required to think pro-environmentally when you repair and service vehicles. And we must do likewise in vehicle manufacture.

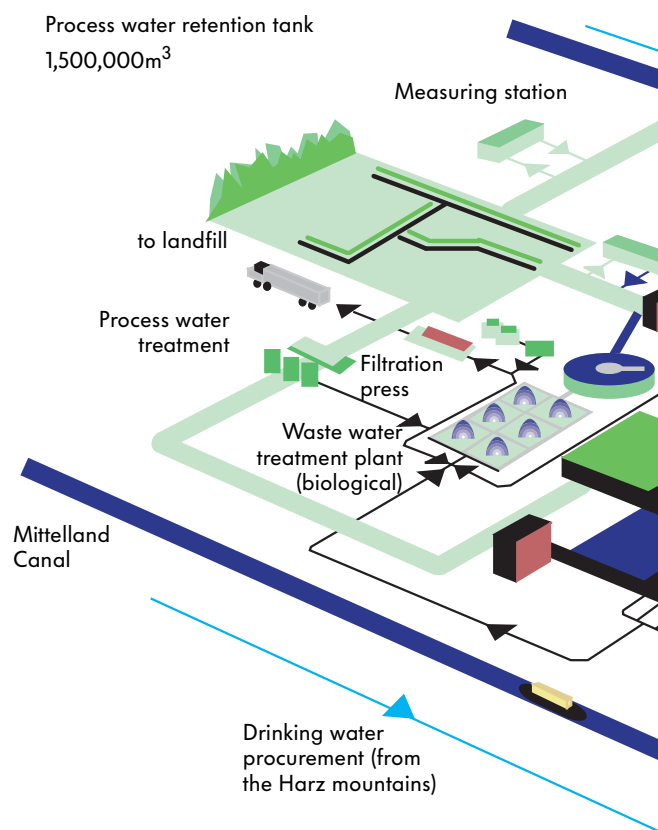
To demonstrate our commitment to in-plant environmental protection throughout all stages of the vehicle production process through to delivery of the finished product, we will be dealing time and again with the topic of environmental protection in the next Self-Study Programmes.

Our customer have high expectations of our products in several respects: reliability, convenience, quality and, not least, environmental compatibility. Firstly, the vehicle itself should pollute the environment as little as possible. This means raising fuel economy, reducing pollutant emissions in exhaust gases and ensuring a high degree of recyclability of the individual components of a car at the end of its life cycle. Secondly, our customers also expect their vehicles to be made in a production facility that meets stringent environmental protection standards.

Volkswagen can look back on a long tradition of protecting the environment. When it built its first - and, to date, largest - plant in Wolfsburg, Volkswagen even then thought about ways of using the natural resource of water as economically as possible for example. Volkswagen currently circulates and reprocesses more than 95 percent of process water within the plant.

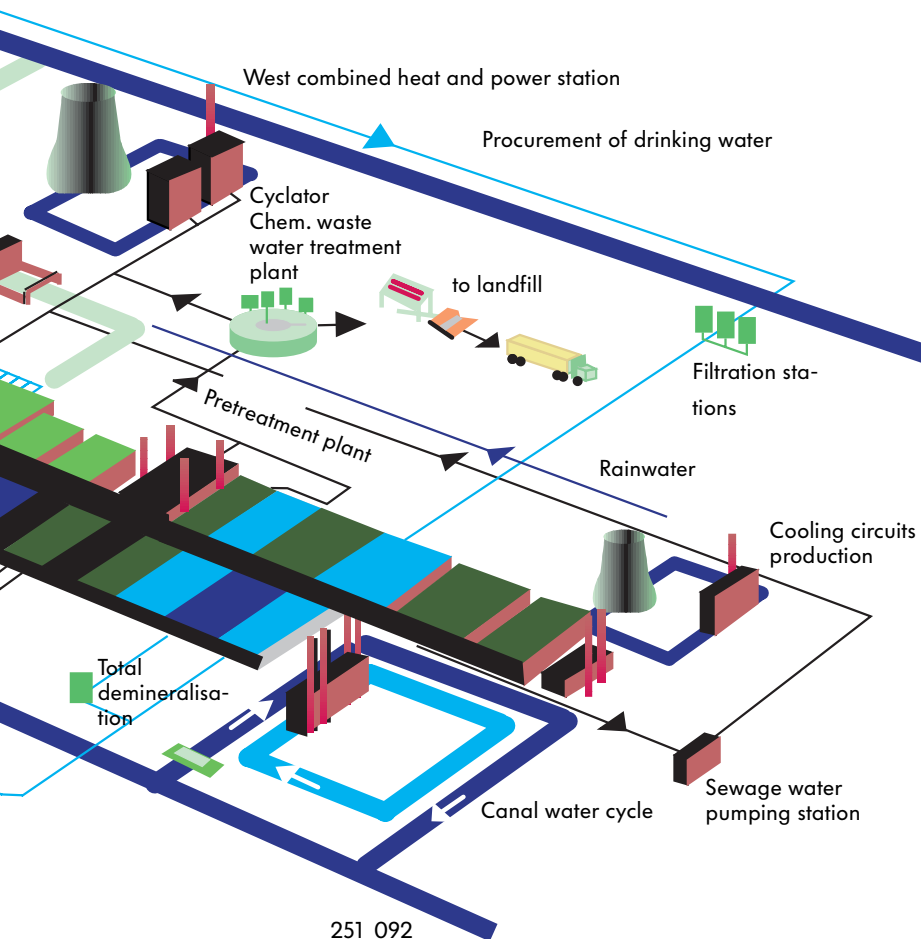
The amount of fresh potable water which Volkswagen annually feeds into its circulation system from external sources accounts for less than five percent of total volume.

The water management plan for Wolfsburg plant



The Emden plant

The Emden plant, where the majority of Passat models are built, was the first automobile manufacturing plant in Europe to be certified (in September 1995). The plant was re-audited and re-certified in September 1998.



To ensure that we maintain high standards in environmental protection, our plants are audited and certified by an independent expert. Our European plants were certified according to the EU eco audit regulations while our non-European plants were certified according to the international ISO 14001 standard.

Occupant protection

The front airbags

Full-size airbags are fitted in the Passat 2001 on the driver's and front passenger's sides. As in the predecessor model, the airbags have filling volumes of approximately 64 and 120 litres respectively.

The central airbag control unit is located behind the central console, above the tunnel.



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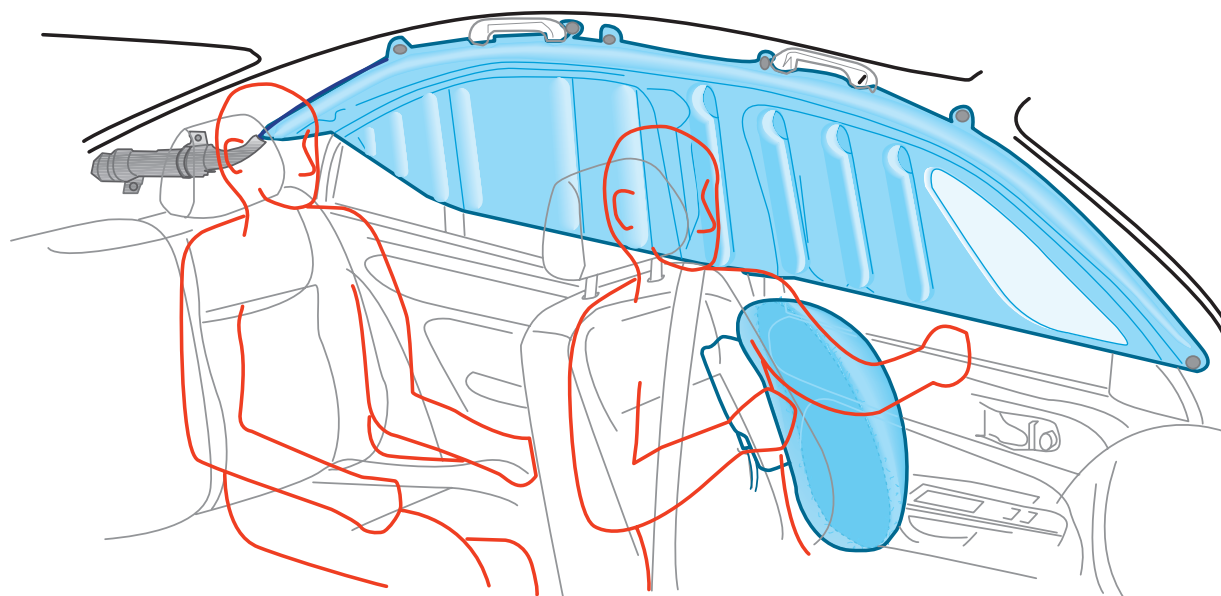
The side and head airbags

The side and head airbags afford excellent side impact protection. The two side airbags, integrated in the front seats, have a filling volume of approximately 12 litres.

The head airbag has a filling volume of approximately 26 litres and is integrated in the vehicle headlining, above the doors.

As before, the system has two lateral acceleration sensors, located beneath the seats. The lateral acceleration sensors are programmed with a vehicle-specific parameter when they are replaced.

Where repair or replacement of defective parts is needed, it is important to specify the correct SP-number.



251_069



The complete part number of the airbag control unit, together with the index (colour code) must be quoted when ordering side impact sensors because these sensors are not labelled with a parameter index. The part number and the colour index can only be read out, or reproduced, from the production data (VIN, year of manufacture, list of PR numbers) by using the workshop tester.

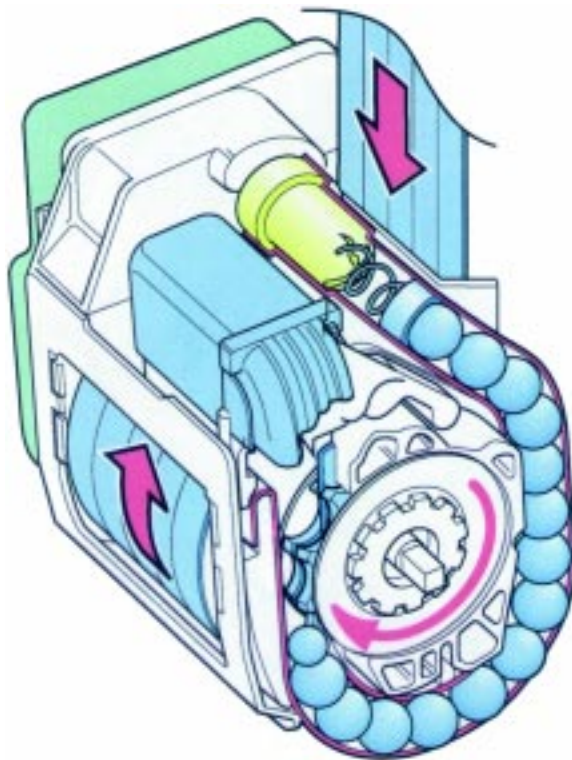
The belt tensioner/belts

Belts and BELT TENSIONERS round off the restraint system. Standard belt tensioner systems are used in the outer seat positions, front and rear. These systems deploy mechanically and pyrotechnically.

Ball-type tensioners are used in the front seating positions. In comparison with the predecessor model, they are rotated through 180°. The rear seating positions have rotary belt tensioners.

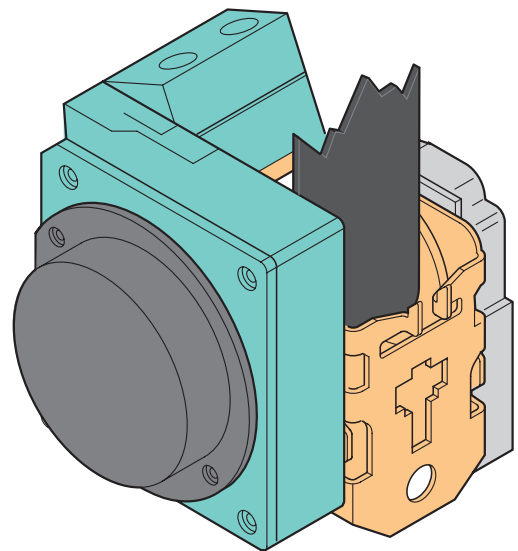


Ball-type tensioner



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Rotary belt tensioner



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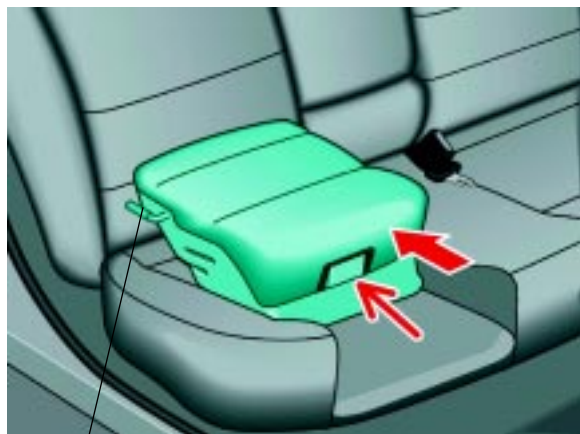


The upper part of the belt buckles in the new Passat is flexible. The lower part is rigidly bolted to the bracket.

Child restraint systems

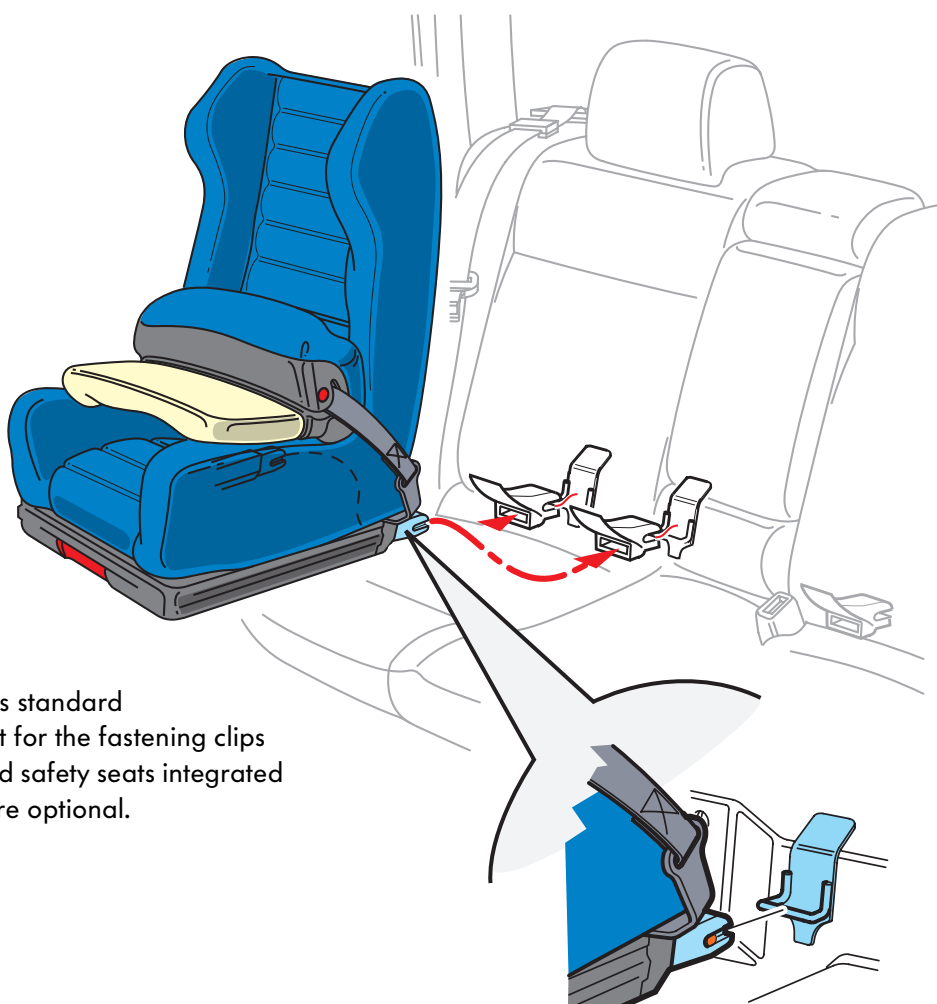
Integrated child safety seats

To make use of the integrated child safety seats, the elements of the seat cushion have to be raised and locked in place. An additional shoulder belt guide corrects the belt position for children with a height from 1.3m - 1.5m. A belt guide hook on the booster cushion ensures an ideal belt position around the child's pelvis.



Belt guide hook

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The Isofix system

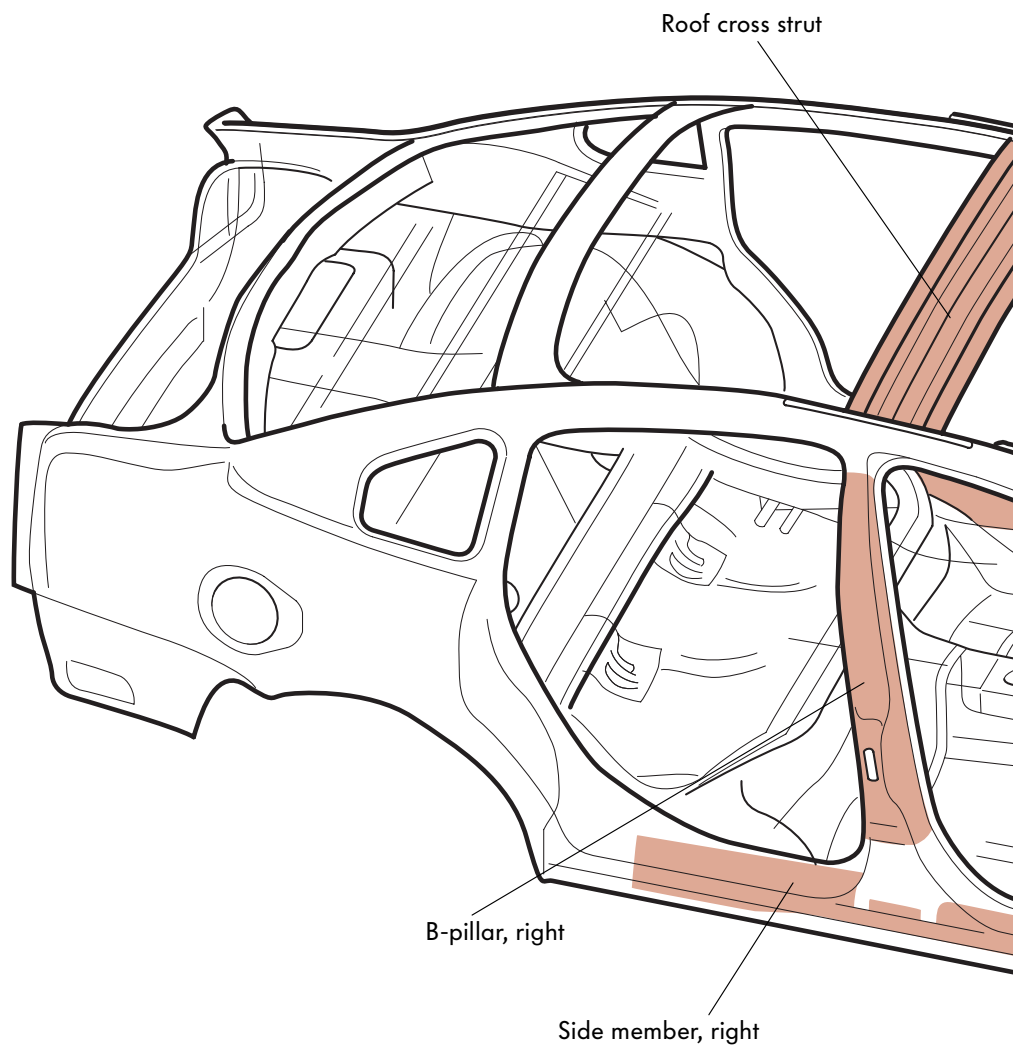
The new Passat comes as standard with an attachment point for the fastening clips of the Isofix system. Child safety seats integrated in the rear bench seat are optional.

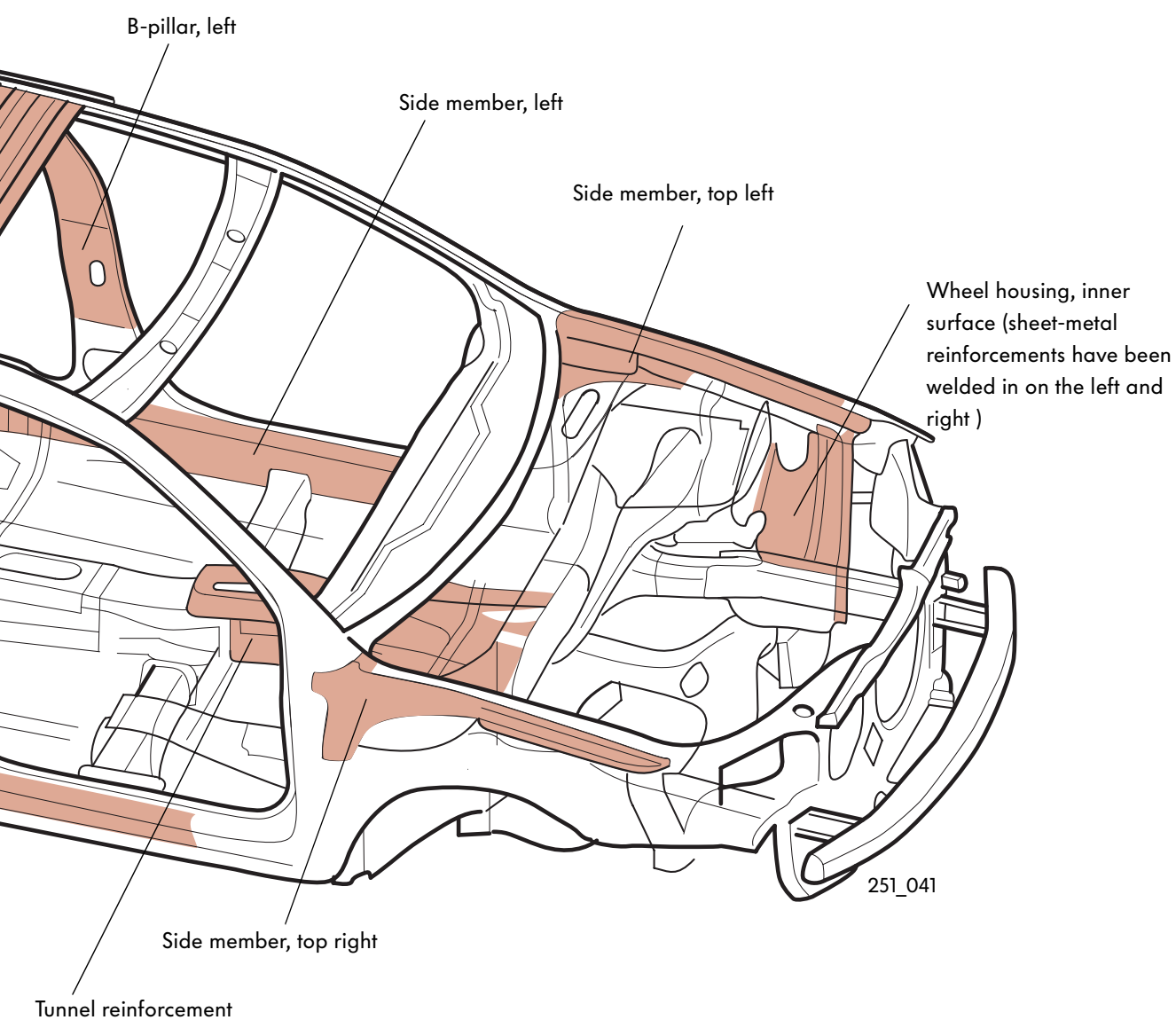
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Body

Body reinforcements

The body of the Passat 2001 was reinforced in the zones described below. In other words, the body panels have been thickened and the spot welds have been supplemented with laser-welded seams.





Vehicle safety and natural body vibration (40 Hz) have been greatly improved as a result of these modifications.



The engines

Engines in general

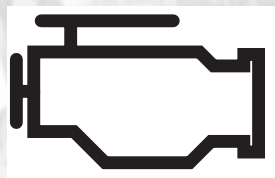
On the following pages, you will find descriptions of the engines to be used in the new Passat. They include specifications, torque and performance curves, as well as details of technical features and engine modifications.

In developing all engines, special emphasis was put on raising fuel economy and reducing exhaust emissions.

These engines now meet the following standards:

- all petrol engines conform to the EU 4 exhaust emission standard and
- all diesel engines conform to the EU 3 exhaust emission standard.

A self-diagnosis fault warning lamp is now integrated in the dash panel insert in all petrol-engined vehicles.



251_044

If a component with a bearing on exhaust emissions fails while the vehicle is in operation (e.g. misfiring), the self-diagnosis fault warning lamp begins to flash. If a component is identified as being defective while the vehicle is in operation, the self-diagnosis fault warning lamp lights up continuously.

In both cases, the engine must be inspected immediately.

All engines have an electrical throttle control. For more effective antitheft protection, the engine-control unit communicates with the immobiliser control unit via CAN databus (3rd generation immobiliser).

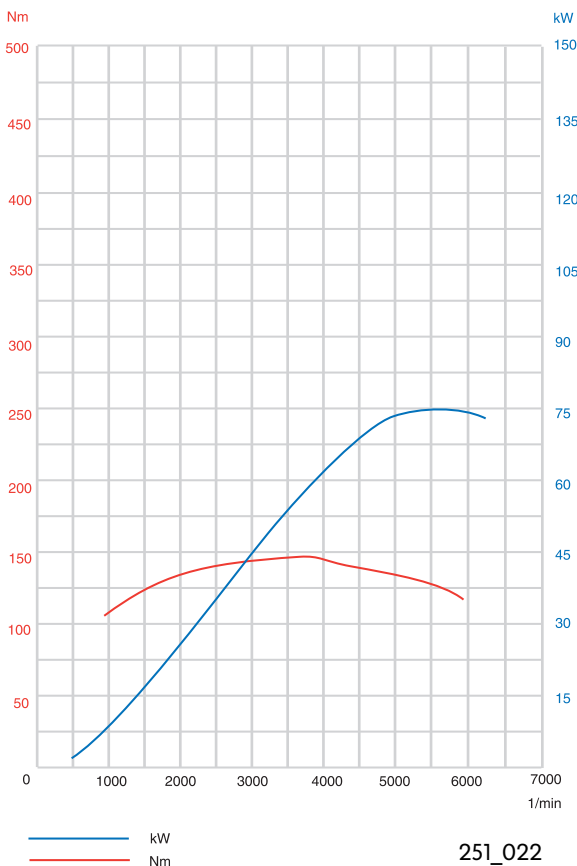


1.6-litre 75 kW petrol engine

The engine is an improved version of the 1.6-litre petrol engine developing 74kW.

The following components were optimised with regard to friction work and mass for higher fuel economy:

- the conrods (TRAPEZOIDAL CONRODS) were optimised for mass
- the piston lands were lowered to reduce piston mass
- ALUMINIUM CYLINDER HEAD WITH ROLLER CAM FOLLOWERS



Specifications

Engine code	ALZ
Displacement	1595 cm ³
Type	Row
Number of cylinders	4
Number of valves per cylinder	2
Compression ratio	10.3:1
Bore	81.0 mm
Stroke	77.4 mm
Max. power	75 kW/102 bhp @ 5600 rpm
Max. torque	148 Nm @ 3800 rpm
Engine management system	Simos 4
Fuel grades	RON 95 unleaded petrol (the Passat also operates on RON 91 unleaded petrol, with reduced engine power)

The Engines

1.8-litre 110 kW petrol engine with 5 valves per cylinder and turbocharger

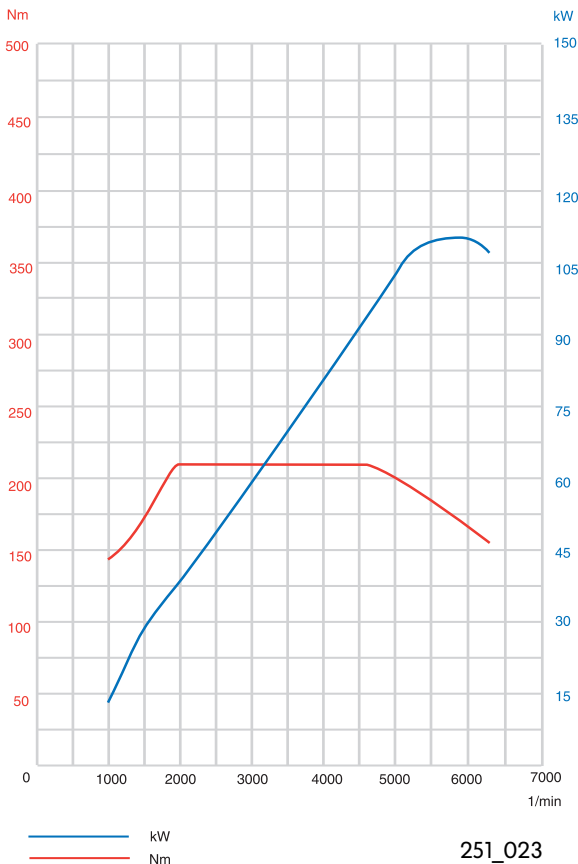
The engine was adopted from the predecessor model and adapted to meet the applicable exhaust emissions regulations, as outlined below.

- No intermediate shaft
- Oil pump is chain driven
- Piston crown cooling via oil spray jet
- Rod-type ignition coils with integrated output stage
- PLANAR PROBE BEFORE CATALYST
- Camshaft timing control - timing chain adjuster, inlet camshaft only
- The water pump is driven by a toothed belt



Specifications

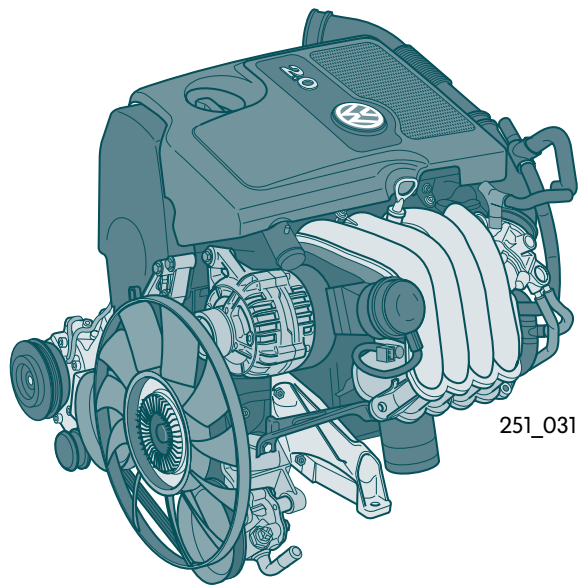
Engine code	AWT
Displacement	1780 cm ³
Type	Row
Number of cylinders	4
Number of valves per cylinder	5
Compression ratio	9.3:1
Bore	81.0 mm
Stroke	86.4 mm
Max. power	110 kW/150 bhp @ 5700 rpm
Max. torque	210 Nm @ 1750-4600 rpm
Engine management system	Bosch Motronic ME 7.5
Fuel grades	RON 95 unleaded petrol (the Passat also operates on RON 91 unleaded petrol, with reduced engine power)



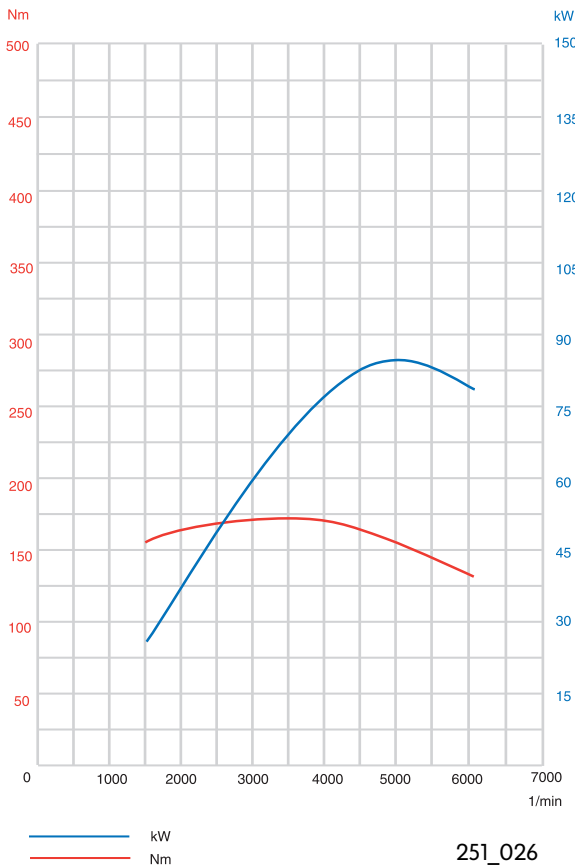
2.0-litre 85 kW petrol engine

The 2.0-litre engine was adopted from the predecessor model.

In vehicles which have automatic transmission, an electrical vacuum pump produces the vacuum required for the brake booster (see page 43).



251_031



251_026

Specifications

Engine code	AZM
Displacement	1984 cm ³
Type	Row
Number of cylinders	4
Number of valves per cylinder	2
Compression ratio	10.3:1
Bore	82.5 mm
Stroke	92.8 mm
Max. power	85 kW/110 bhp @ 5000 rpm
Max. torque	172 Nm @ 3500 rpm
Engine management system	Simos 3.2
Fuel grades	RON 95 unleaded petrol (the Passat also operates on RON 91 unleaded petrol, with reduced engine power)

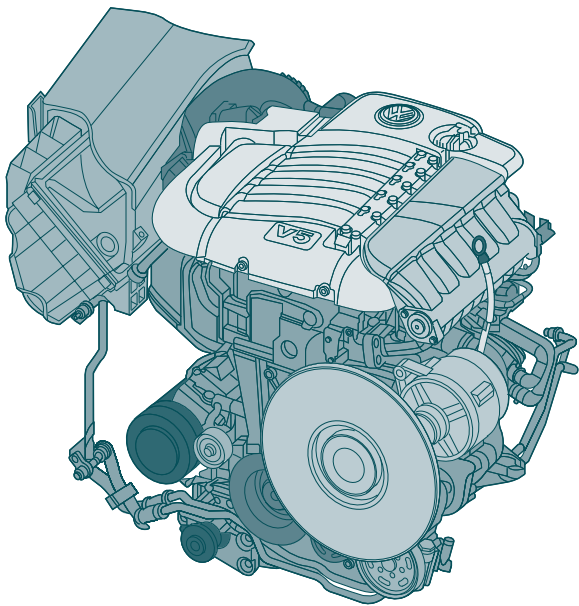
The Engines

The 2.3-litre 125 kW V-5 petrol engine with 4 valves per cylinder

The following modifications have been made to this engine:

- 4 valves per cylinder
- ROLLER CAM FOLLOWER valve gear
- BUILT-UP CAMSHAFT
- CAMSHAFT TIMING CONTROL intake and exhaust camshafts
- Plastic twin-path intake manifold
- ELECTRIC THROTTLE DRIVE
- "TUMBLE" INTAKE PORT

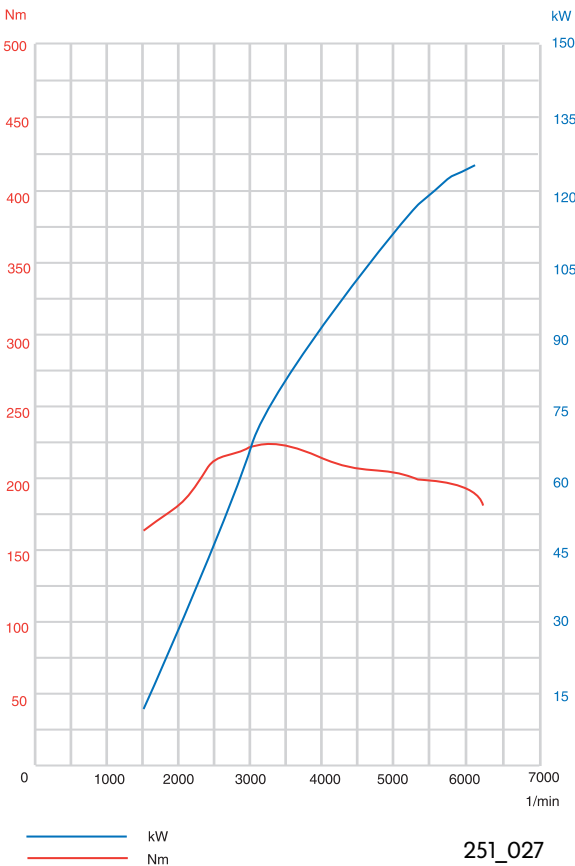
These modifications provide higher power output and torque, and hence better driving performance.



251_030

Specifications

Engine code	AZX
Type	VR
Number of cylinders	5
Number of valves per cylinder	4
Compression ratio	10.75:1
Displacement	2326 cm ³
Bore	81.0 mm
Stroke	90.3 mm
Max. power	125 kW/170 bhp @ 6200 rpm
Max. torque	225 Nm @ 3200 rpm
Engine management system	Bosch Motronic ME 7.1
Fuel grades	RON 98 unleaded petrol (the Passat also operates on RON 95 unleaded petrol, with reduced power output)



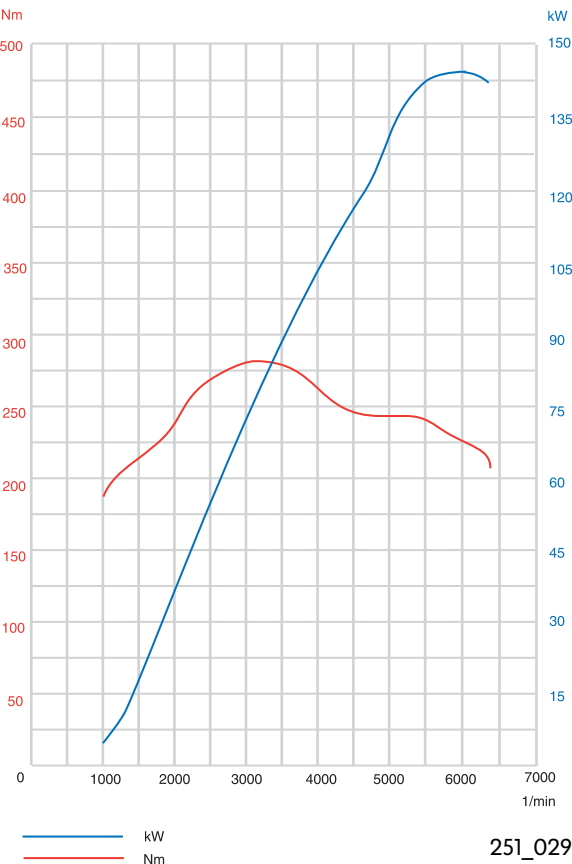
251_027

2.8-litre 142 KW V-6 petrol engine with 5 valves per cylinder

The Passat is still powered by the high-performance 2.8-litre V-6 petrol engine. The following improvements were made to this engine:

- 2 lambda probes were integrated in the exhaust line before the catalyst and
- after the catalyst.

These modifications allow the engine to meet the stringent EU 4 exhaust emission standard.



Specifications

Engine code	AMX
Type	V
Number of cylinders	6
Number of valves per cylinder	5
Compression ratio	10.6:1
Displacement	2771 cm ³
Bore	82.5 mm
Stroke	86.4 mm
Max. power	142 kW/193 bhp @ 6000 rpm
Max. torque	280 Nm @ 3200 rpm
Engine management system	Bosch Motronic ME 7.1
Fuel grades	RON 98 unleaded petrol (the Passat also operates on RON 95 unleaded petrol, with reduced power output)

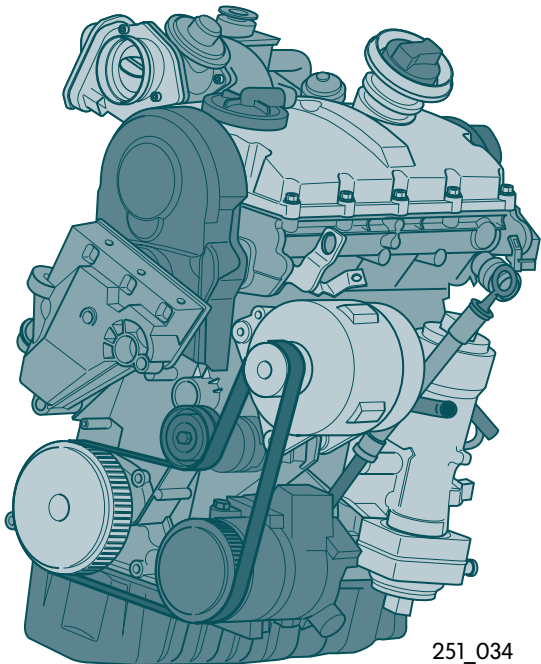
The Engines

1.9-litre 74 kW TDI engine with pump injection system

The 1.9-litre 74 kW TDI engine is based on the 1.9-litre TDI engine developing 85 kW.

It differs from the basic engine in the following respects:

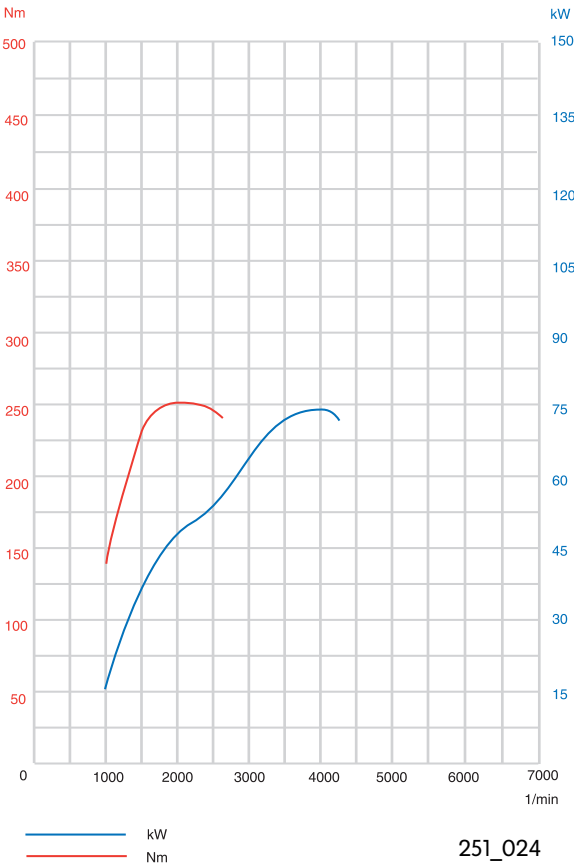
- The software used in the engine control unit was adapted to the lower engine power.
- The injectors have smaller nozzle holes.



251_034

Specifications

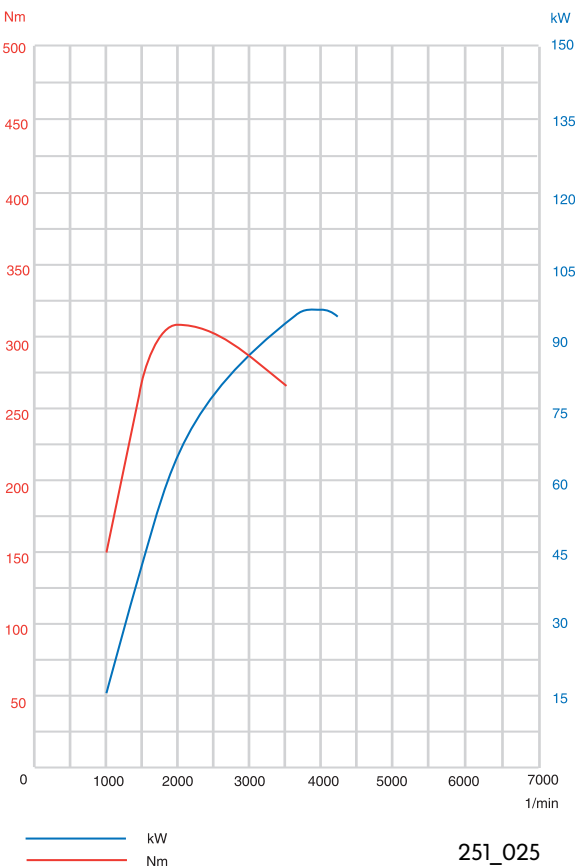
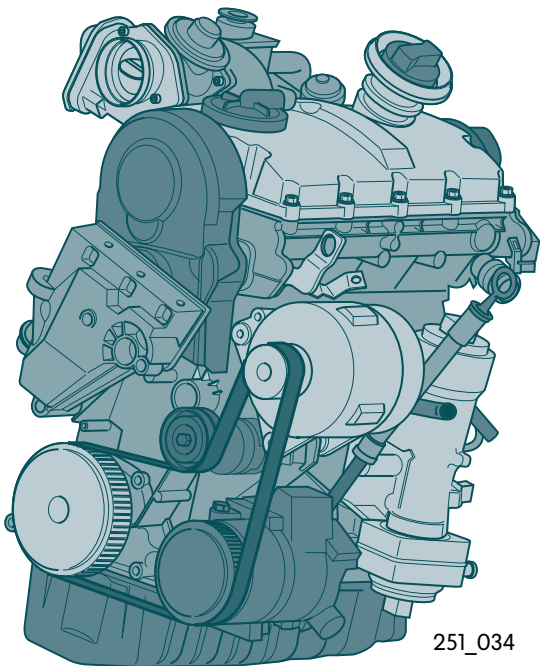
Engine code	AVB
Type	In-line engine
Number of cylinders	4
Number of valves per cylinder	2
Compression ratio	19:1
Displacement	1896 cm ³
Bore	79.5 mm
Stroke	95.5 mm
Max. power	74 kW/100 bhp 4000 rpm
Max. torque	250 Nm @ 1900 rpm
Engine management system	BOSCH EDC 15 P
Mixture preparation	Direct injection by pump injection system
Fuel grades	49 CN diesel, biodiesel



The 1.9-litre 96 kW TDI engine with pump injection system

The 1.9-litre 96 kW TDI engine differs from 1.9-litre 74kW TDI engine with pump injection system in the following respects:

- The software used in the engine control unit was adapted to the higher engine power.
- The injectors have larger nozzle holes.
- The TURBOCHARGER is larger.
- The crankcase is made of stronger material.
- The crank pin diameter of the crankshaft has been enlarged.
- The conrods are made of stronger material.



Specifications

Engine code	AVF
Type	In-line engine
Number of cylinders	4
Number of valves per cylinder	2
Displacement	1896 cm ³
Bore	79.5 mm
Stroke	95.5 mm
Compression ratio	19:1
Max. power	96 kW /130 bhp 4000 rpm
Max. torque	310 Nm @ 1900 rpm
Engine management system	BOSCH EDC 15 P
Mixture preparation	Direct injection by pump injection system
Fuel grades	49 CN diesel, biodiesel

The Engines

The 2.5-litre V-6 TDI engine developing 110 kW

The 2.5l V-6 TDI ENGINE DEVELOPING 110 kW has demonstrated its success in the predecessor model and will also be used in the Passat 2001

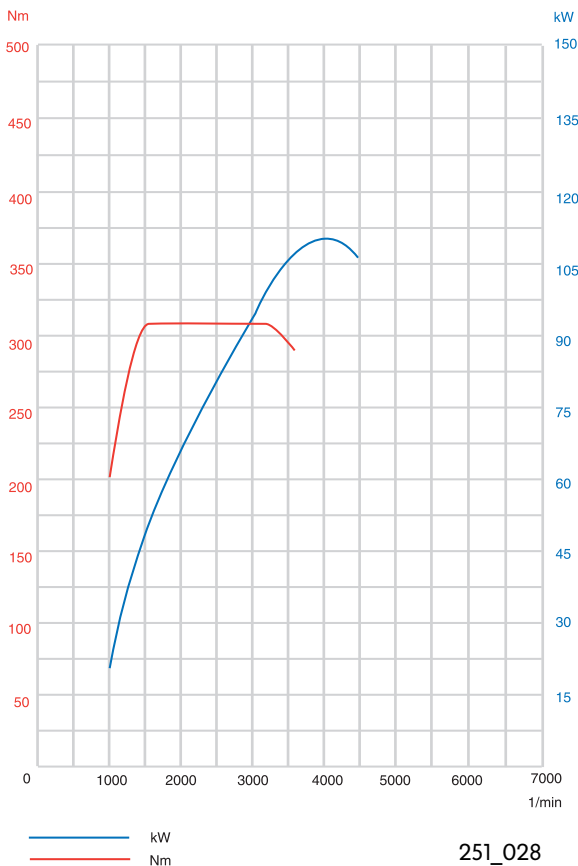
The following technical innovations were employed to improve mixture preparation and reduce exhaust emissions:

- The number of pump pistons in the radial-piston distributor injection pump was increased by 1, thereby raising the maximum INJECTION PRESSURE.
- The 5-hole injector has been replaced by a 6-hole injector
- Improved CRANKCASE VENTILATION



Specifications

Engine code	AKN
Type	V-engine
Number of cylinders	6
Number of valves per cylinder	4
Displacement	2496 cm ³
Bore	78.3 mm
Stroke	86.4 mm
Compression ratio	19.5 : 1
Max. power	110kW/150 bhp 4000 rpm
Max. torque	310 Nm @ 1500-3200 rpm
Engine management system	Bosch EDC 14 M
Mixture preparation	Direct injection by electronically controlled distributor injection pump
Fuel grades	49 CN diesel, biodiesel

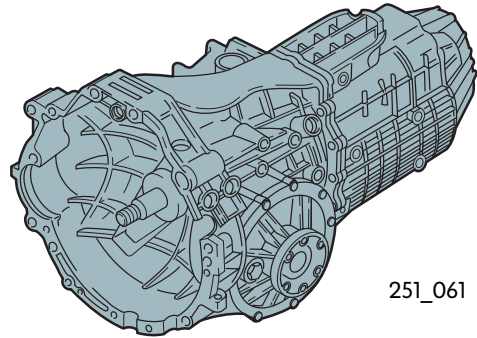


Manual gearboxes

5-speed manual gearbox 012/01W

The 012 or 01W manual gearbox has a proven service record in the predecessor model.

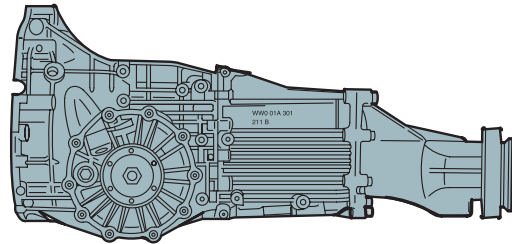
It will be installed as a 5-speed gearbox in combination with all petrol engines and also in the 74 kW diesel engine.



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5-speed manual gearbox 01A

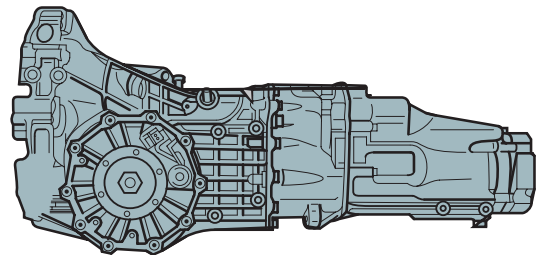
The 01A four-wheel drive manual gearbox from the predecessor model will be installed as a 5-speed gearbox in combination with the 2.0-litre, 2.3-litre and 2.8-litre petrol engines.



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5- and 6-speed manual gearbox 01E

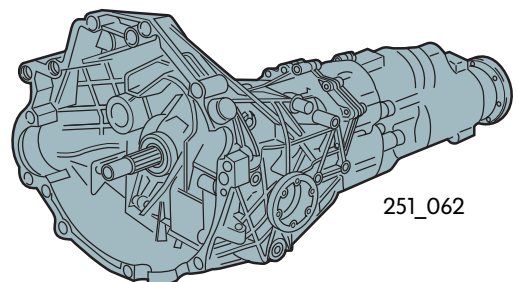
The 01E manual gearbox will be installed as a 5- or 6-speed manual gearbox in combination with the turbodiesel engines developing 96 kW and in the V-6 TDI.



251_053

The 01E four-wheel drive manual gearbox (4 Motion)

will be installed in the Passat 2001 as a 6-speed gearbox in combination 4- and 6-cylinder turbodiesel engines from 96 kW.



251_062



Power Transmission

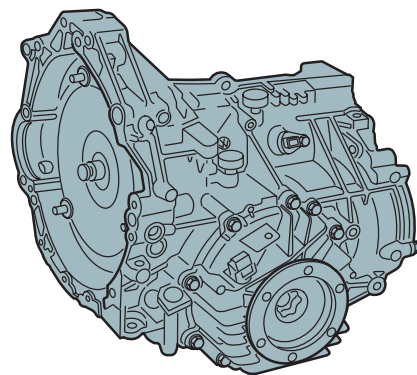
Automatic gearbox

The new Passat is available with the same automatic transmission as in the predecessor model. The design and function of both automatic transmissions have been adopted without change.

4-speed automatic gearbox 01N

The 01N four-speed automatic gearbox is notable for:

- driver- and situation-dependent driving programs, fuzzy logic controlled
- a drag-dependent driving program
- a torque converter with lock-up clutch



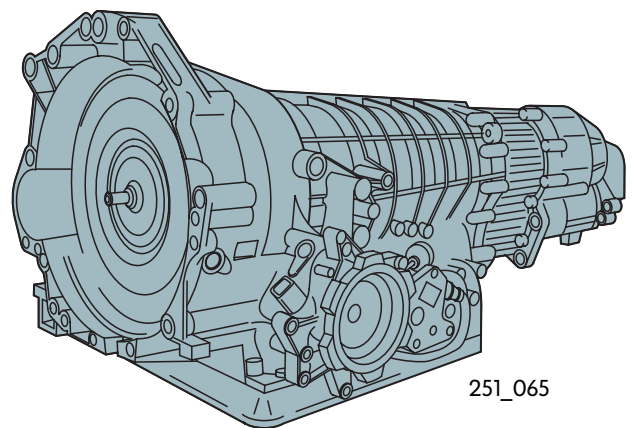
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5-speed automatic gearbox 01V

The five-speed automatic transmission 01V has:

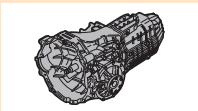
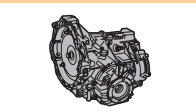
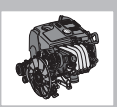
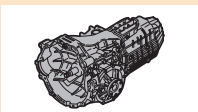
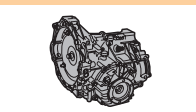
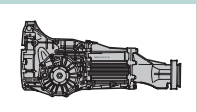
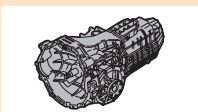
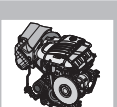
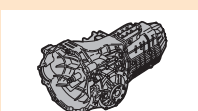
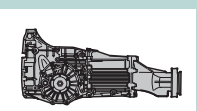
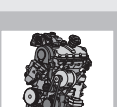
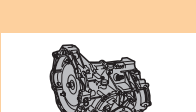
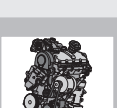
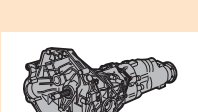
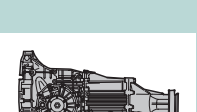
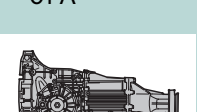
- a dynamic shift program (DSP)
- Tiptronic
- a torque converter with torque converter lock-up clutch

The 5-speed automatic gearbox is also available as a 4 Motion gearbox.



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Engine/gearbox combinations

	Front		4 Motion	
				
1.6-litre ALZ	012 / 01W	01N		
				
1.8-litre AWT	012 / 01W	01N	01 A	
				
2.0-litre AZM	012 / 01W	01 V		
				
2.3-litre AZX	012 / 01W	01 V	01 A	
				
2.8-litre AMX				01 V
				
1.9-litre AVB	012 / 01W	01N		
				
1.9-litre AVF	01 E	01 V	01 A	
				
2.5-litre AKN	01 E	01 V	01 A	01 V

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