Audi A3 - Presentation

Self-Study Programme

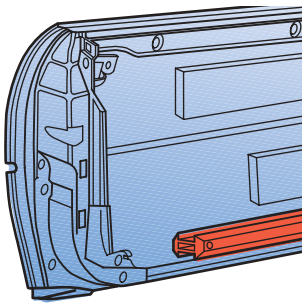
640.2809.9820Technischer Stand: 07/96

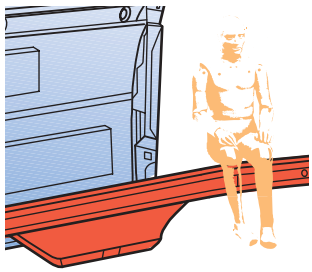
Service Department

A3

Ecology

ÖKOLOGIE





SICHERHEIT

Safety

MOBILITÄT

Mobility

A Self-Study Programme is not a Workshop Manual.

Please refer to the Service Literature which contains all the relevant adjustment, inspection and repair instructions.

New

Important/Note

In this Self-Study Programme we will introduce you to the Audi A3.

The technical details are explained in Self-Study Programme 182.

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In brief

The Audi A3 is a car which offers:

- outstanding quality,
- a high safety standard,
- and an emotive design.

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The Audi is sporty and comfortable.

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SSP 181/85

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In brief

Typical A3 drivers are:

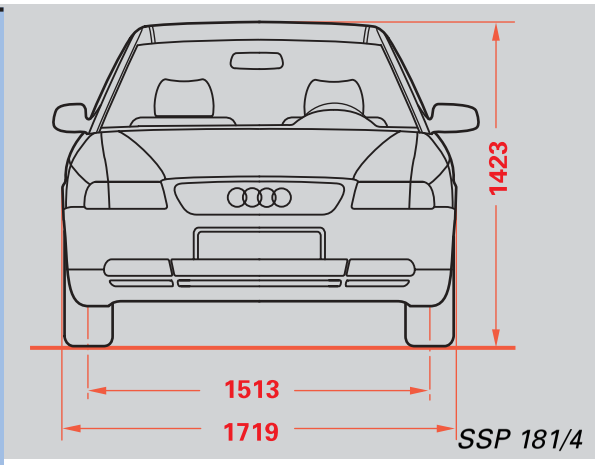
- young,
- modern,
- and sporty

To them, driving is an adventure.

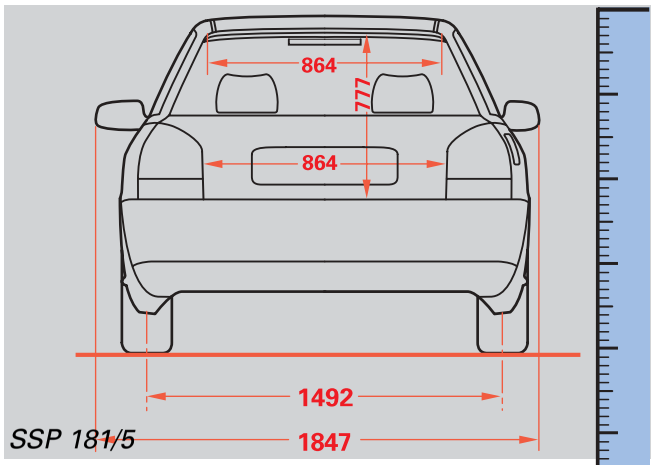
SSP 181/3

In brief

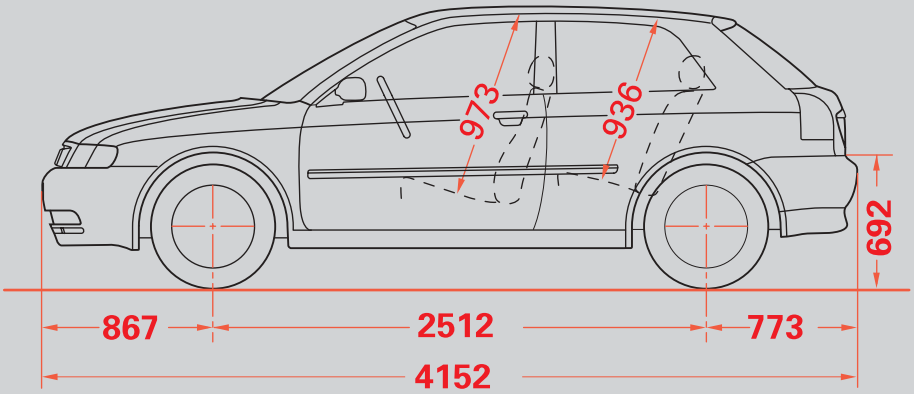
The dimensions of the compact Audi
(all specified dimensions are in mm.)



SSP 181/4

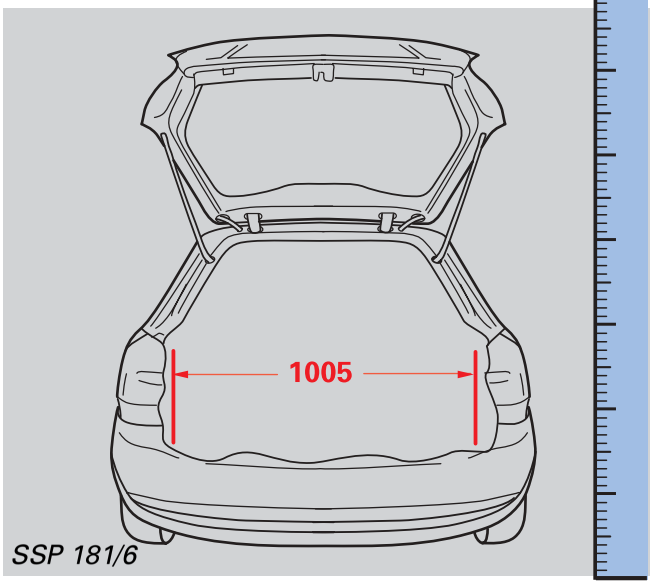


SSP 181/5



SSP 181/6

The Audi A3 has a through-loading width of 1005 mm.



SSP 181/6

Vehicle aerodynamics

Aerodynamics is about investigating how gases flow around solid bodies.

Vehicle aerodynamics is about investigating how air flows around the vehicle.

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SSP 181/8

As you can see, the shape of a car plays a key role.

If the air resistance is low, less force is needed to overcome it.
This saves energy. And saves fuel.

With its low C_d, the Audi cuts a good figure.

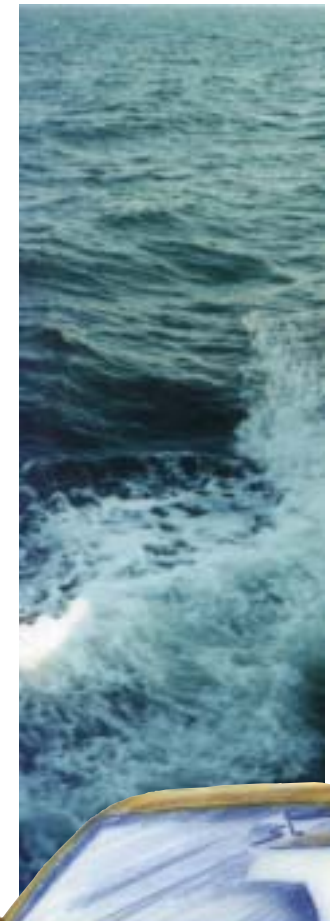
In brief

What does Cd stand for?

c_d = drag coefficient

Environmental protection is...

only what people make of it.



SSP 181/10

In brief

Less environmental pollution:

- Use of lighter materials improves fuel economy.
- Use of water-based paints means fewer solvents.
- Use of recyclable materials saves raw materials.

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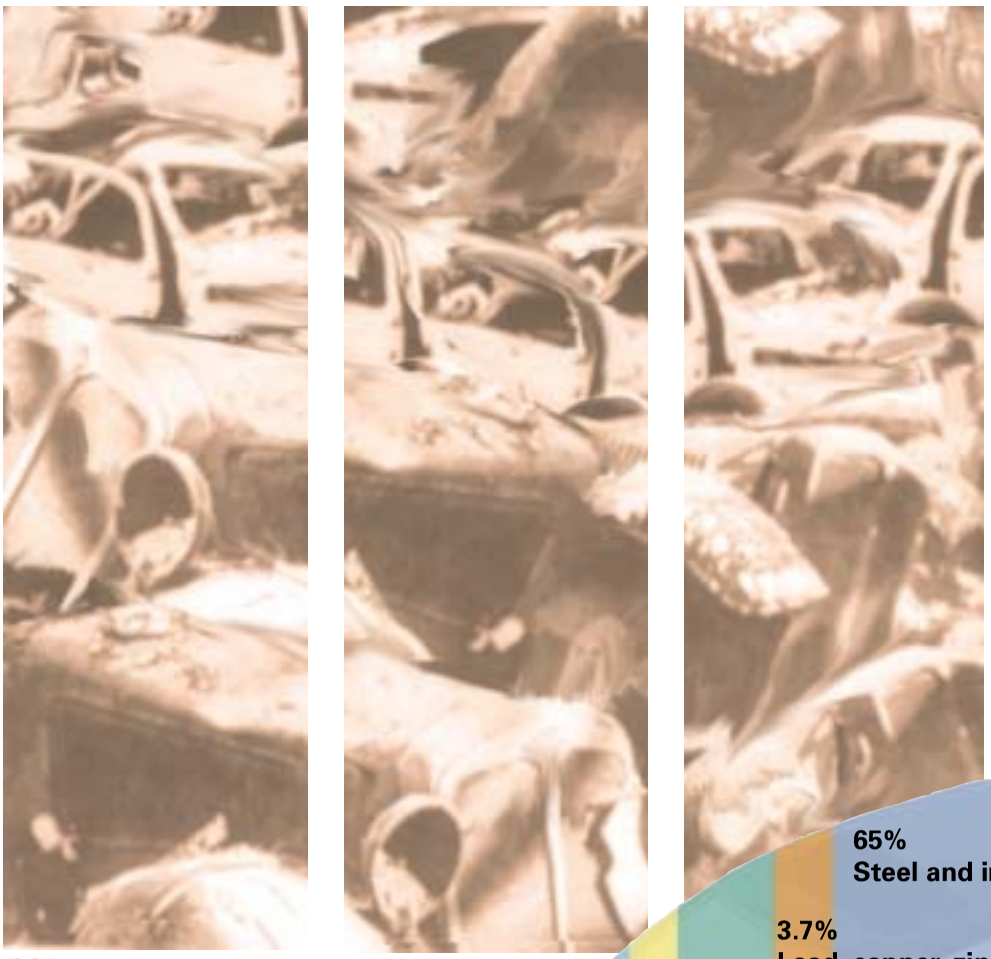
SSP 181/9

More than just scrap iron

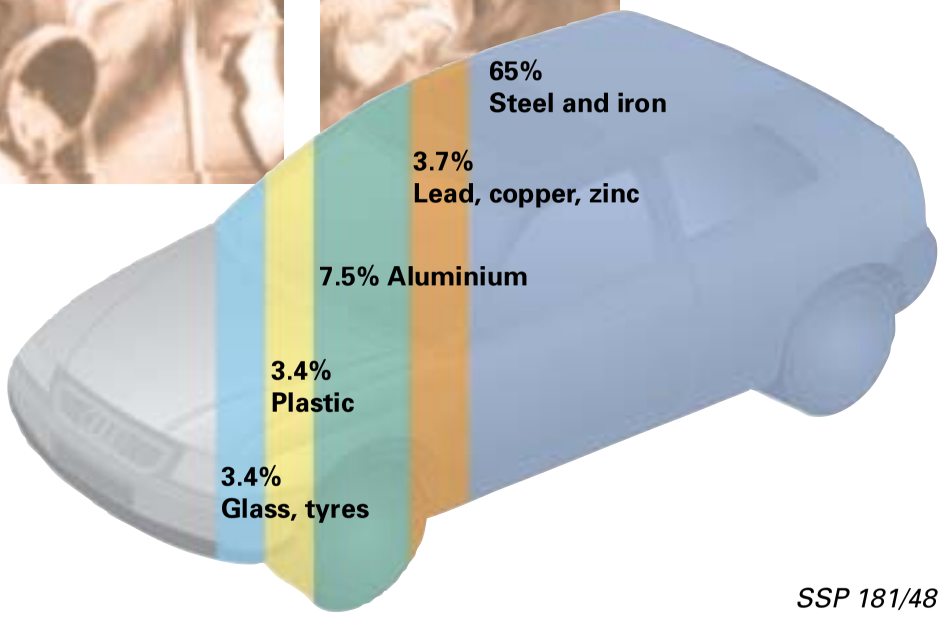
It makes good ecological sense to strip scrap cars of all usable materials and put them back into circulation in a new form as more environmentally-friendly cars.



SSP 181/11

The object of the exercise is the eco-friendly utilisation of all scrap cars.

83% of the Audi A3 is made of recyclable materials.



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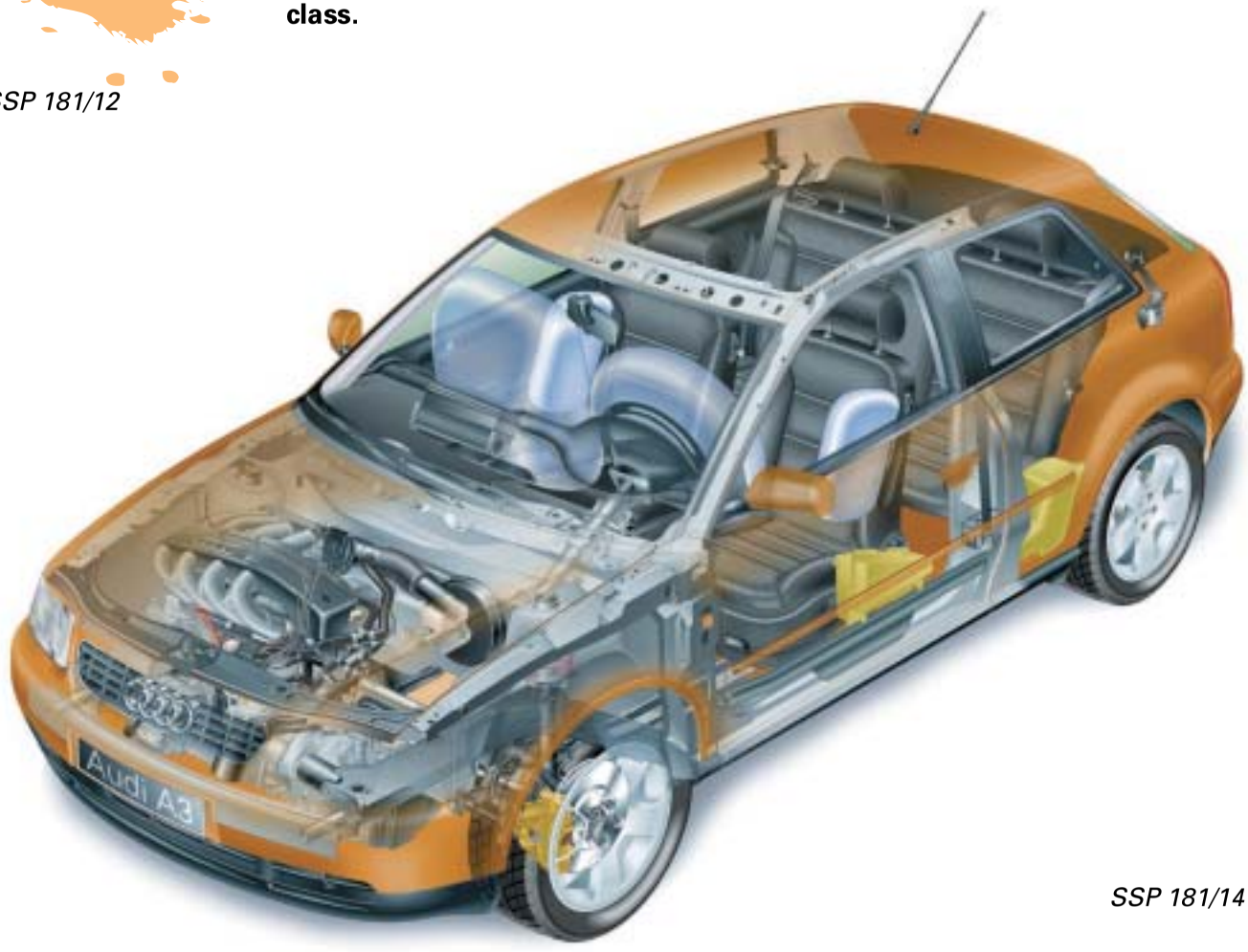
How safe is the A3?

The Audi also achieves an impressive safety standard.
It is the safest car in its class.

SSP 181/12



SSP 181/14

You will already be familiar with many of the "active and passive safety" features.

Here are a few examples:

Active safety

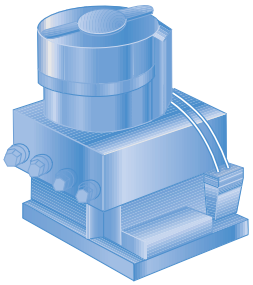
Body

SSP 181/15

Rear disc brakes with aluminium floating caliper

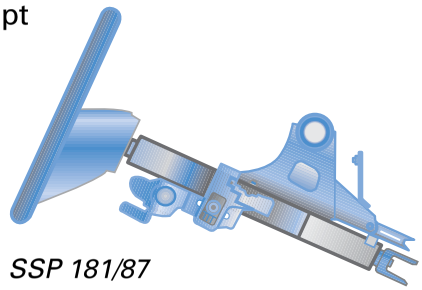
SSP 181/16

Anti-lock braking system



SSP 181/17

Crash concept Steering



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Passive safety

Driver and front passenger airbags

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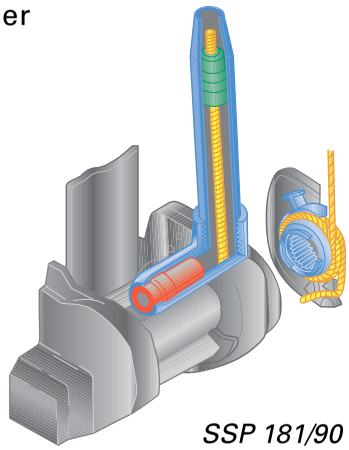
Side airbag

SSP 181/89

Seat belt tensioner



SSP 181/90

Inner and side door trim panels with integrated padding

SSP 181/91

The outer skin of the car

While expressing comfort and taste, the body also provides security and safety.

SSP 181/18

The Audi A3 has a fully galvanised body.

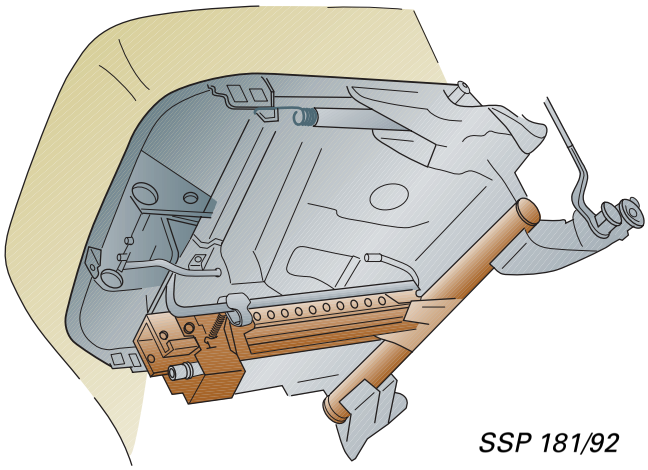
Audi uses only top-quality materials from body construction through to final assembly and vouches for the reliability of every detail.

Tried and tested concepts are employed:

- Use of aluminium parts
- All models come with padding plus aptly lined door sides
- Use of laser welding technology in the roof area
- Mash-welded panels are used for the side members (panels are of different thickness)

How does the body manage to protect us?

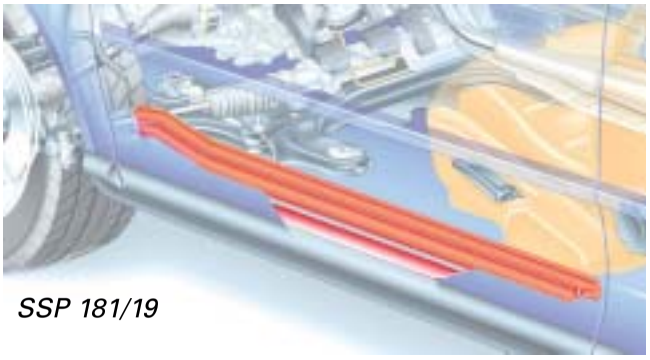
Seats with high transverse rigidity



SSP 181/92

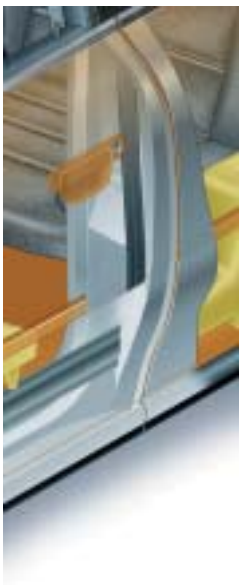
Inside and side door trim panels with integrated padding

SSP 181/91



SSP 181/19

High-strength door side reinforcements made of aluminium which support one another inside the door sill during a crash



Wide door overlap at door pillar and in door sill area

SSP 181/21

SSP 181/20

Aluminium cross members in bumpers

Engines

The big movers

We will introduce you to the new engines of the Audi A3 on the following pages.

The objective during development was to reduce fuel consumption and pollutant emissions even further. This was achieved by shedding weight, and by employing new technologies and different materials.

Engine weight was reduced by:

- omitting the intermediate shaft
- fitting an aluminium oil pan
- using plastic components
- using lightweight valve gear in all engines
- cylinder block made of aluminium (1.6 ltr.)

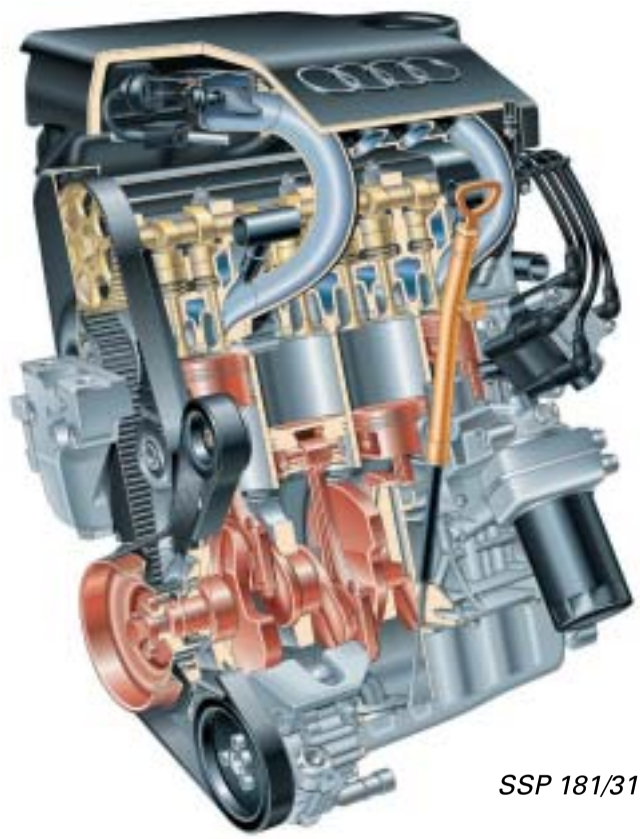
SSP 181/30

New engineering:

- New oil pump chain-driven by crankshaft
- New oil circuit
- New water pump in cylinder block driven by rib belt
- Thermostat in cylinder block
- Engine management system with 16-bit computer
- Engine control units with identical housings and two-part connector

Different materials were used to make these components:

- Aluminium oil pan
- Replaceable oil filter insert made of paper (in 1.9 ltr. TDI engine)
- Auxiliary component holders made of aluminium
- Coolant pump impeller made of plastic
- Plastic twin-path intake manifold

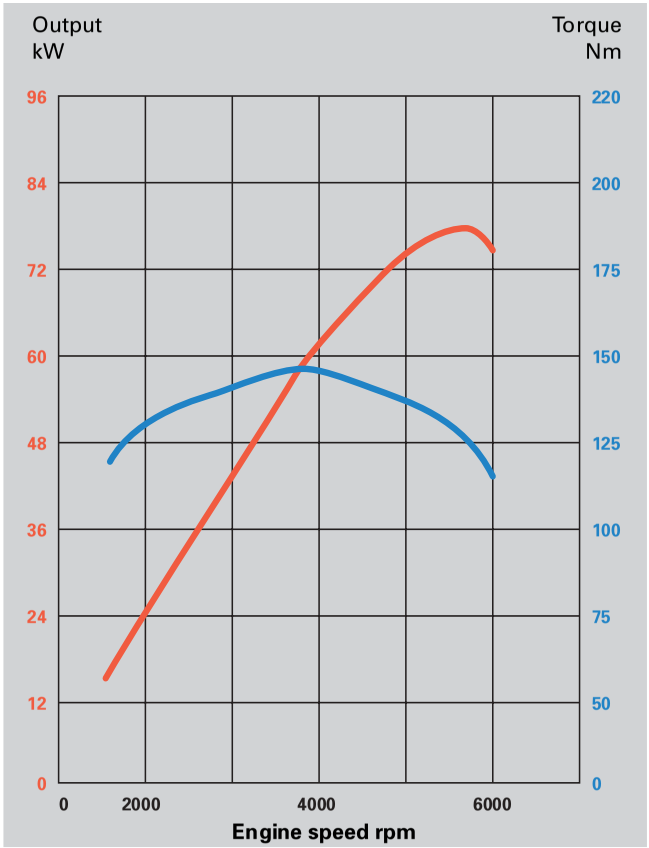


SSP 181/31

1.6 ltr. engine

Engine code AEH

- Aluminium cylinder block with internal vent pipe
- Press-fitted cast iron cylinders
- Plastic twin-path intake manifold
- Simos 2 engine management system
- Static high-voltage distributor



SSP 181/32

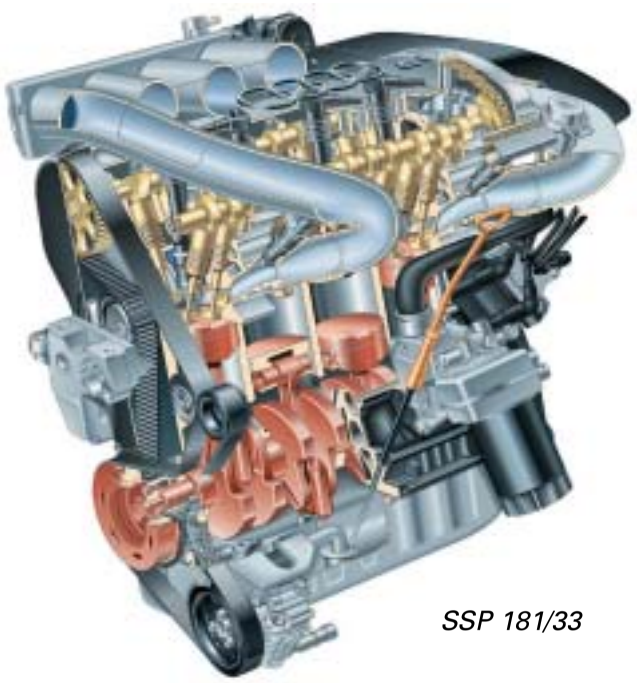
Displacement:	1595 cc
Output:	74 kW (100 bhp)
Engine management:	Simos 2
Fuel:	Premium unleaded, 95 RON

The engine may also run on regular unleaded fuel (91 RON), but this reduces max. power.

The 1.6 ltr. engine develops 74 kW (100 bhp) at an engine speed of 5600 rpm.

Peak torque is 145 Nm at 3800 rpm.

Engines

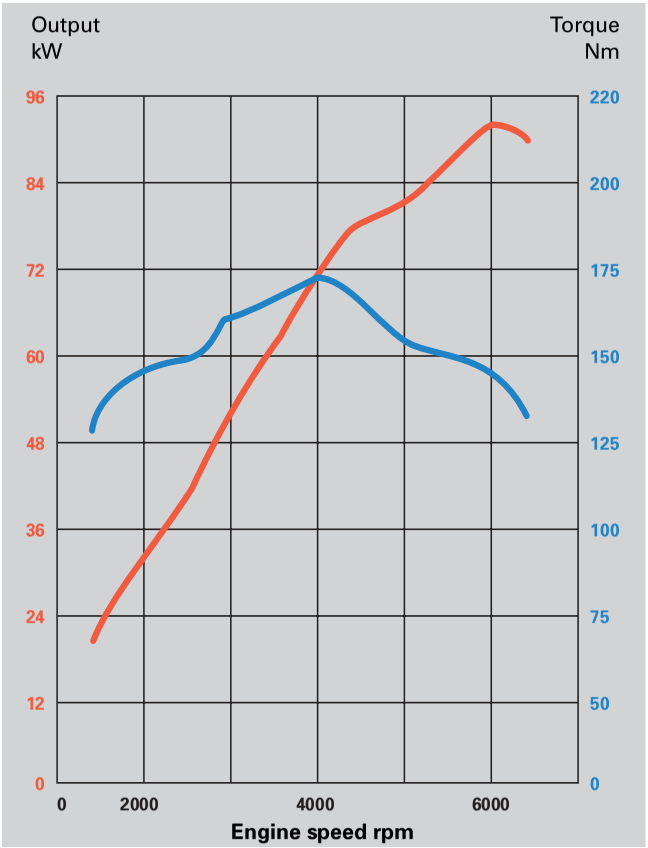


SSP 181/33

1.8 ltr

Engine code AGN

- Hydraulic inlet camshaft adjustment, electronically
- controlled Motronic 3.8.2 engine
- management system Static high-voltage distributor



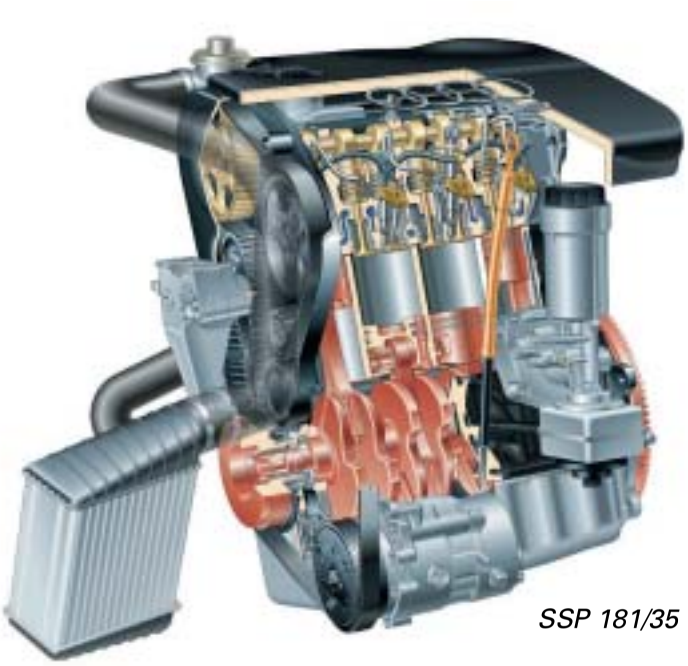
SSP 181/34

Displacement:	1781 cc
Output:	92 kW (125 bhp)
Engine management:	Motronic 3.8.2
Fuel:	Premium unleaded (95 RON)

The engine may also run on regular unleaded fuel (91 RON), but this reduces max. power.

The 1.8 ltr. 5-valve engine develops 92 kW (125 bhp) at an engine speed of 5900 rpm.

Peak torque is 173 Nm at 4000 rpm.

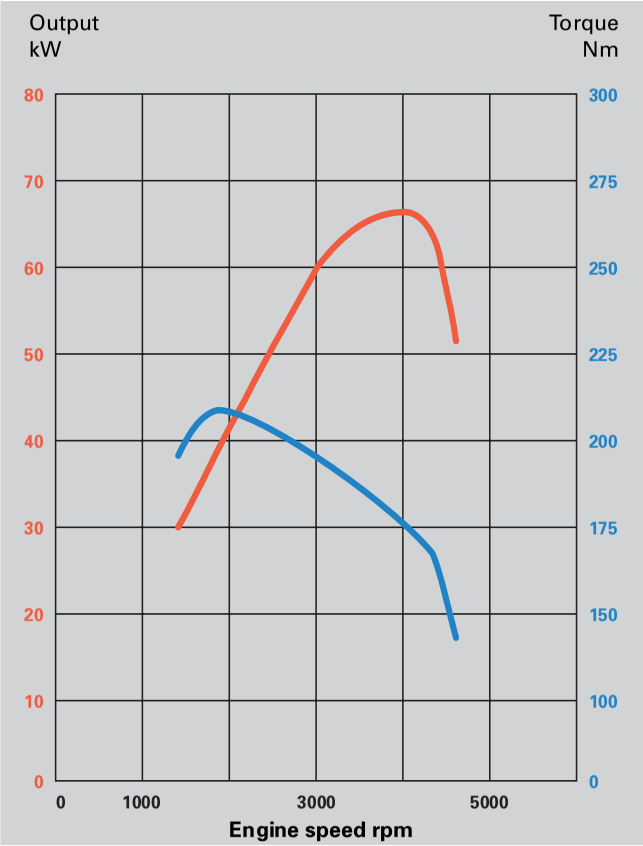


SSP 181/35

1.9 ltr. TDI engine

Engine code AGR

- Preset injection pump with two-part rib belt wheel
- Lightweight valve gear
- Vertical oil filter with replaceable paper insert
- Camshaft-driven vacuum pump



SSP 181/36

Displacement:	1896 cc
Output:	66 kW (90 bhp)
Mixture preparation:	Direct injection, with electronically controlled pilot injection pump
Fuel:	Diesel; can also be run on biodiesel.
Exhaust gas treatment:	Exhaust gas recirculation system and two-way catalytic converter

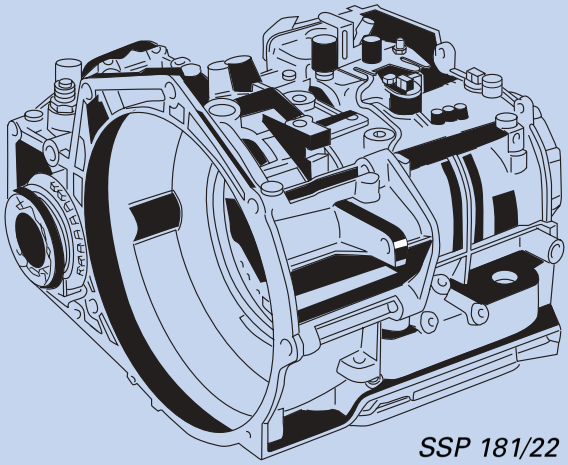
The 1.9 ltr. TDI engine develops 66 kW (90 bhp) at an engine speed of 4000 rpm. Peak torque is 210 Nm at 1900 rpm.

Gearbox

In forward gear

All gearboxes are transversely mounted in pendulum supports.

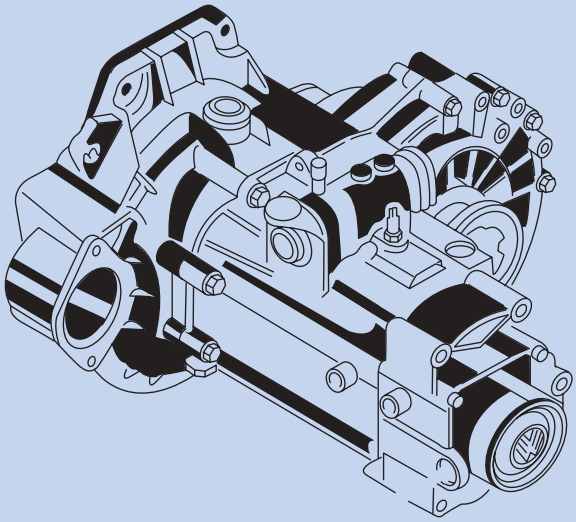
You should already be familiar with the 4-speed automatic gearbox.



SSP 181/22

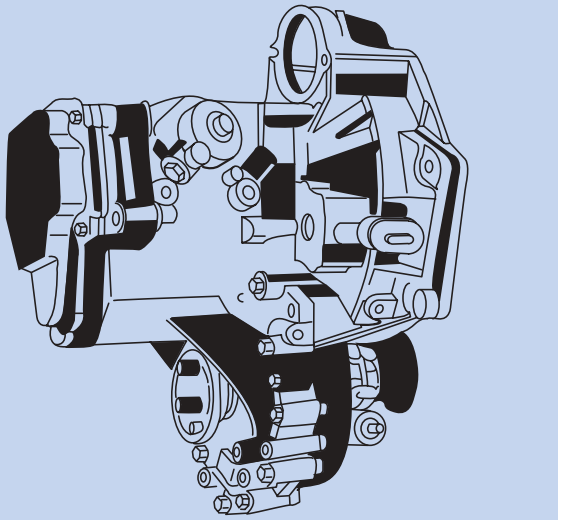
You will find a description of the design and function of the 4-speed automatic gearbox in SSP 172.

The 02 K 5-speed manual gearbox is a more advanced version of the 020 manual gearbox.



SSP 181/23

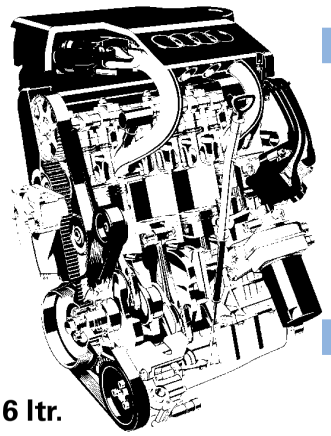
The 02 J 5-speed manual gearbox is a more advanced version of the 02 A manual gearbox.



SSP 181/24

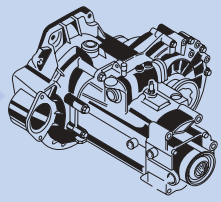
They make a strong team

COMBINATIONS

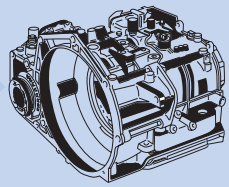


1.6 ltr.

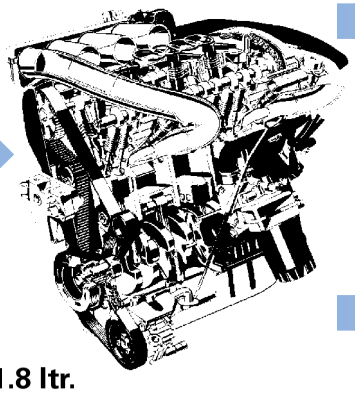
or



02 K

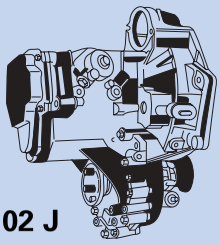


AG 4

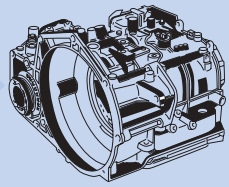


1.8 ltr.

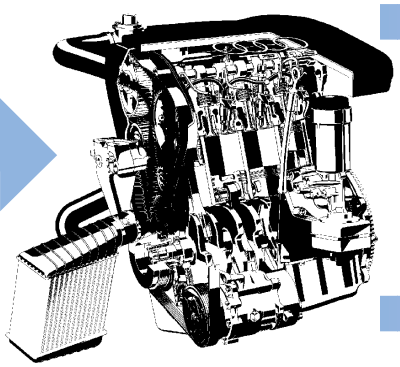
or



02 J

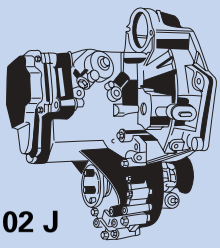


AG 4

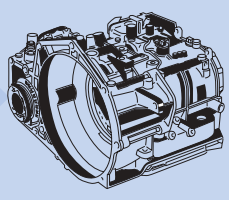


1.9 ltr. TDI

or



02 J



AG 4

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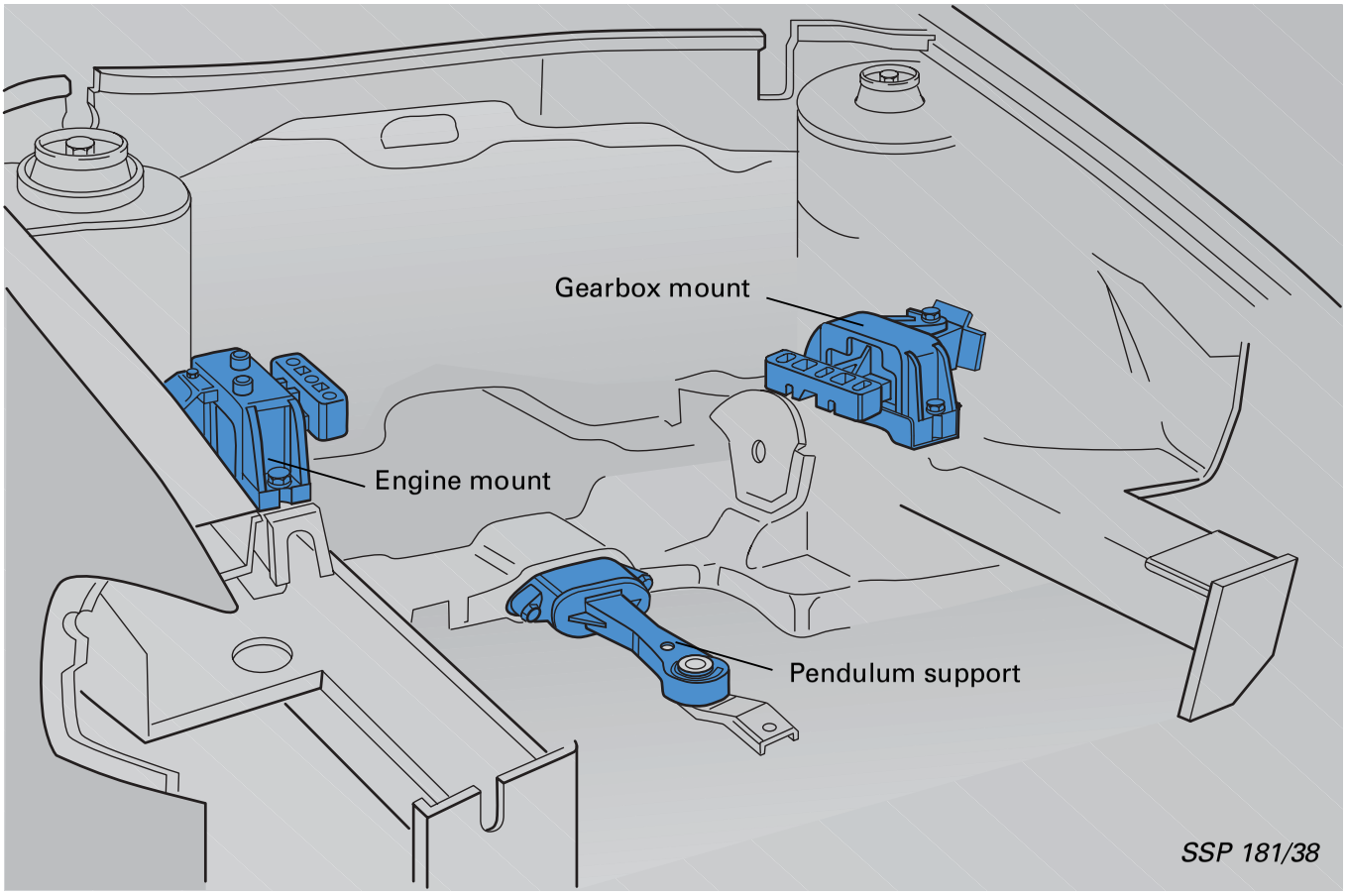
SSP 181/25

Assembly mounting

Controlled swinging?

In the Audi A3, too, the assemblies (engine and gearbox) do not swing - they oscillate.

In other words, the engine and gearbox are installed according to the principle of the pendulum.



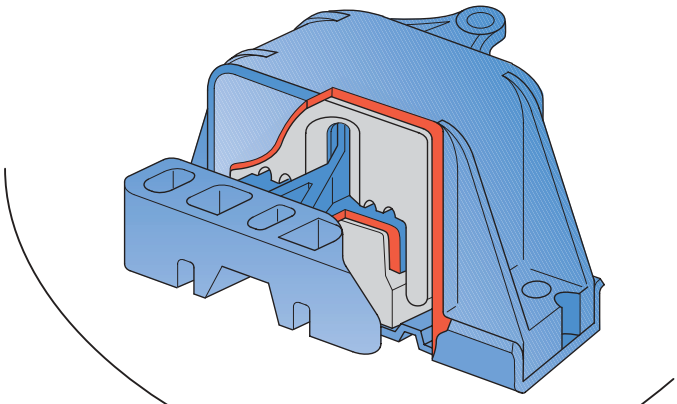
The subframe comprises the following:

- The gearbox mount = Rubber/metal mount
- The engine mount = Hydraulic rubber/ metal mount
- The pendulum support = Rubber/metal mount

A description of the pendulum support is given in Self-Study Programme 166 “Polo“.

The gearbox mount
is a rubber/metal mount comprising modified rubber elements.

This facilitated fine tuning of the 3 force components in the design process.

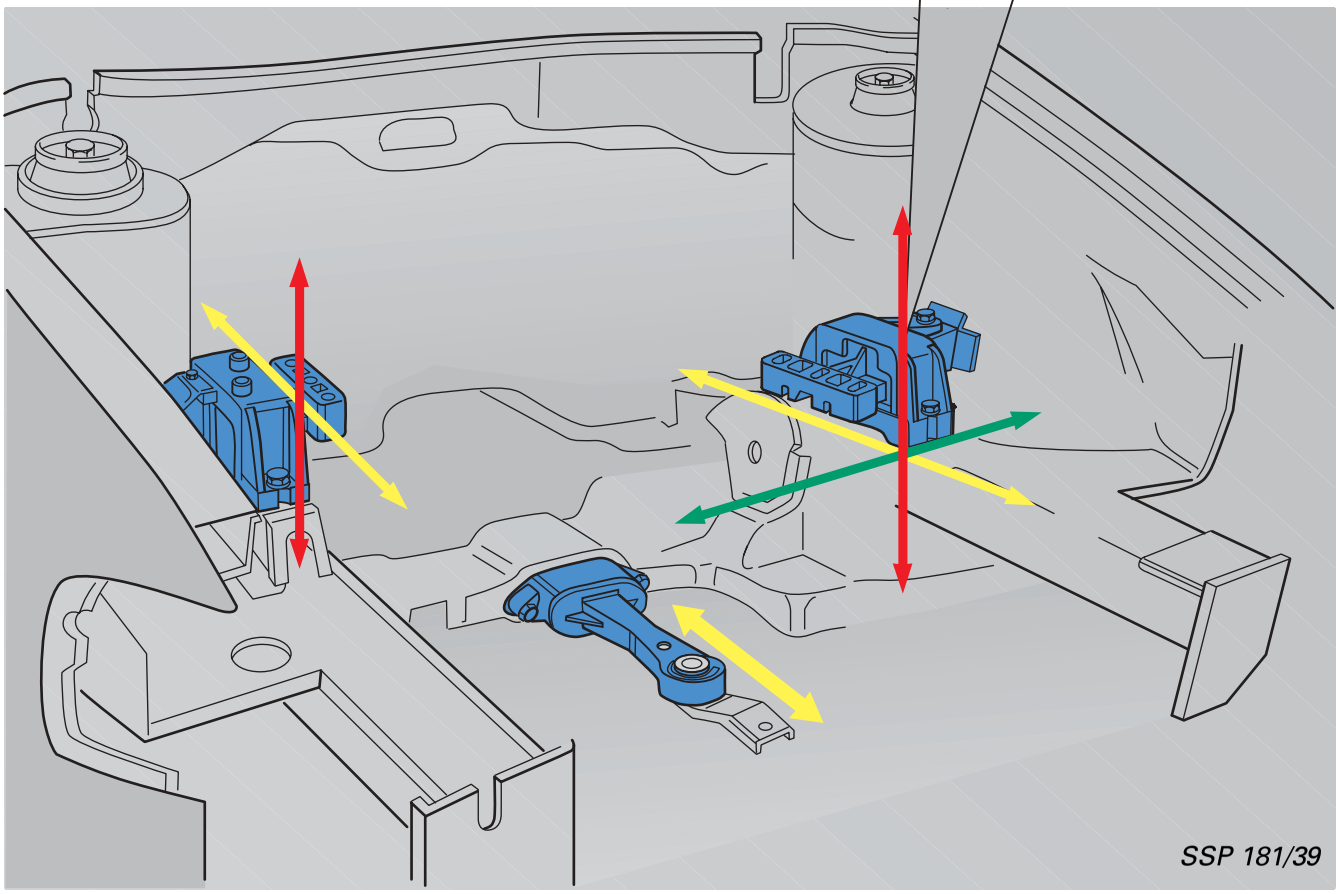


The 3 force components are:

Weight

Engine torque

Centrifugal force when cornering



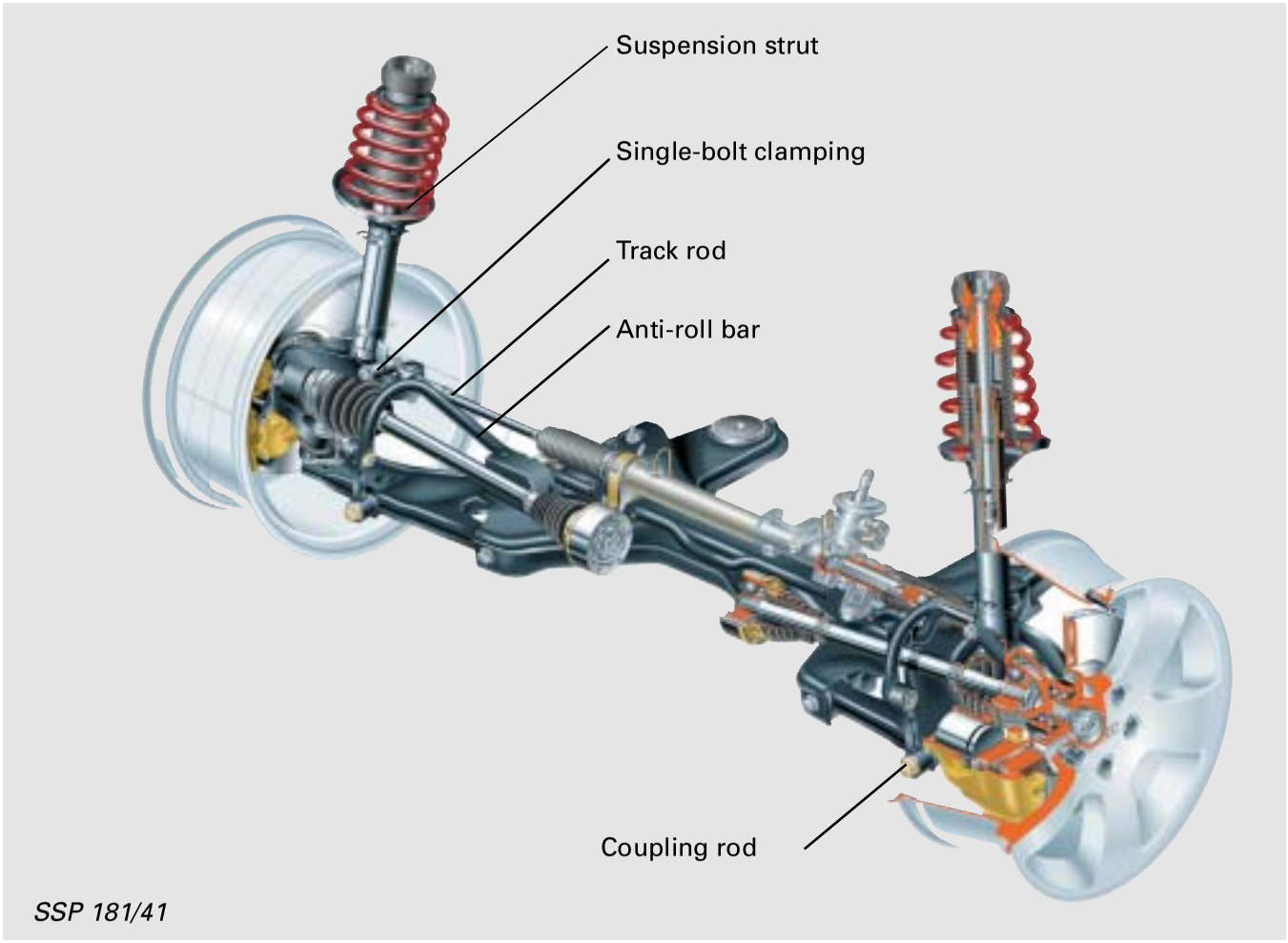
Fine tuning improved the vibration response of the engine and gearbox, thereby enhancing ride comfort even more.

Running gear

With the ability to lead

The basis of the front axle is the 15“ running gear with suspension strut and an A-arm.

- Power Steering as standard
- Cast wheel bearing housing with “single-bolt clamping“
- The two track rods are adjustable
- Plastic coupling rod
- Routing of anti-roll bar

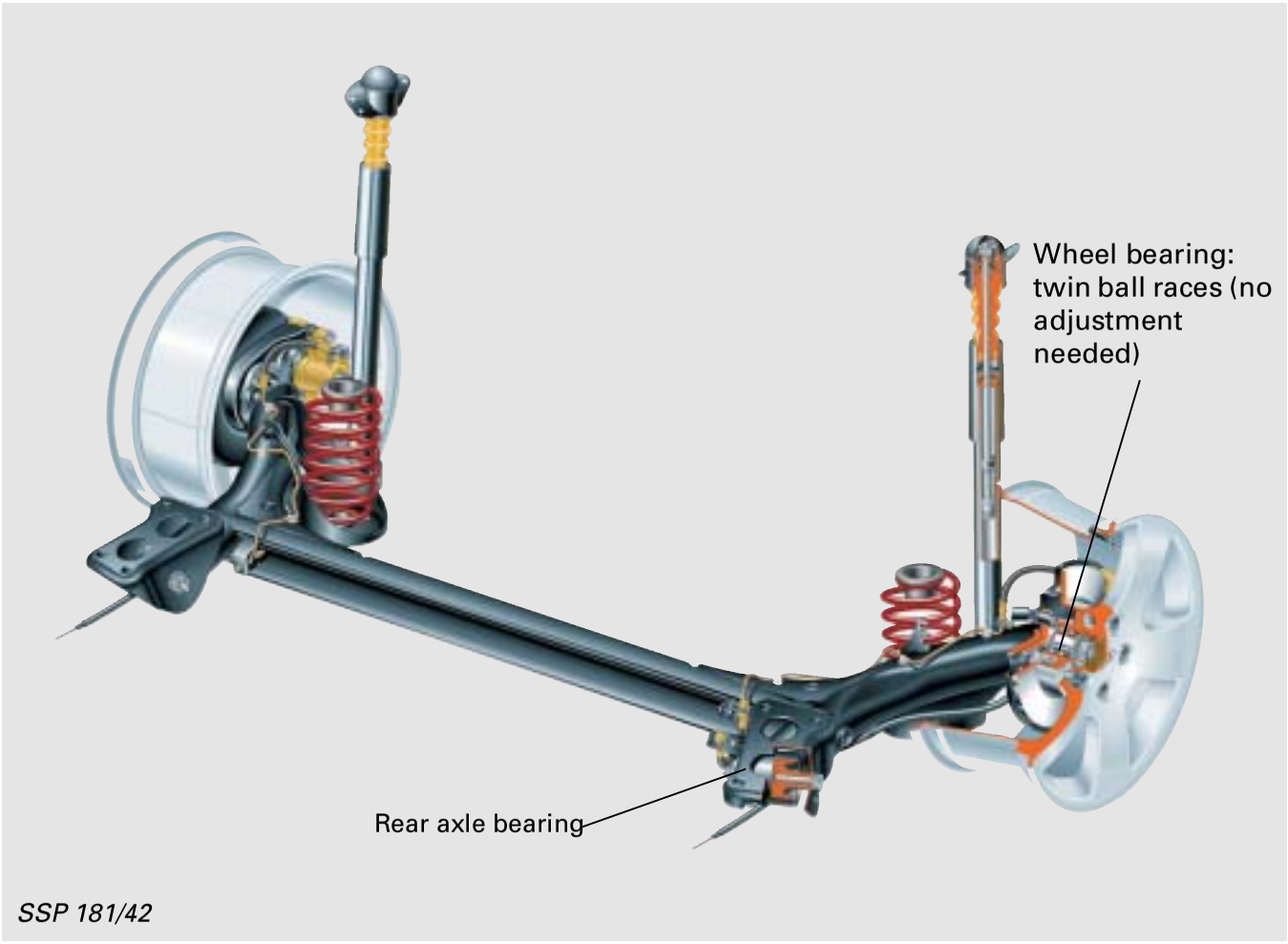


SSP 181/41

With the ability to lead

The rear axle is a torsion beam axle. The shock absorbers and springs are located separately. The shock absorbers are secured in the wheelhouse, increasing the through-loading width and reducing driving noise in the interior.

- Wheel bearing: twin ball races (no adjustment needed)
- Rear axle bearing with 25° inclination
- Anti-roll bar as standard



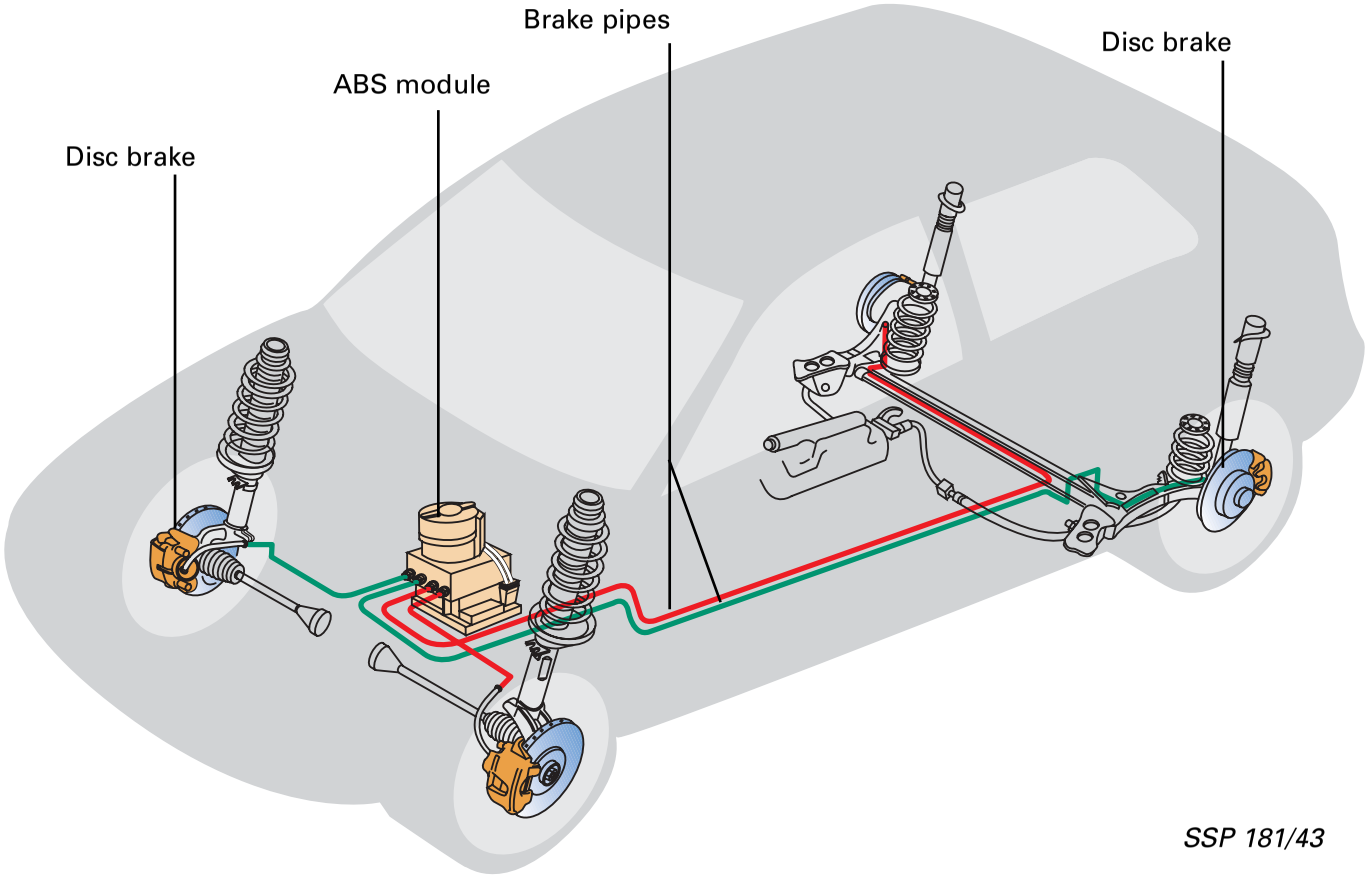
SSP 181/42

Braking system

Power under pressure

The braking system has a diagonal dual-circuit design.

- Ventilated disc brakes at front as standard
- Disc brake with aluminium floating caliper at rear as standard
- Brake pipe with aluminium/plastic covering, improved corrosion protection
- ABS as standard, 20 GI system (ITT automotive Europe, amalgamation with Teves)



SSP 181/43

Brake servo:
Left-hand drive ø 10“
Right-hand drive ø 7“/ 8“

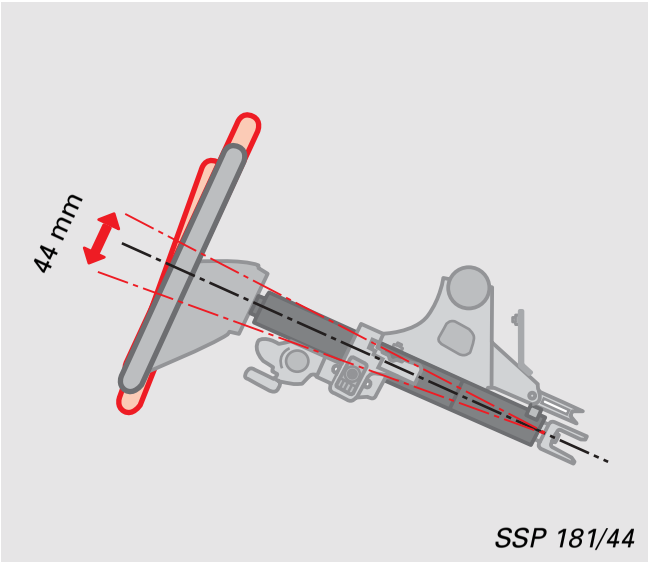
Because there is less space in right-hand-drive vehicles, a 7“/ 8“ diameter tandem brake servo is fitted.

ABS, see SSP 171!

Highs and lows

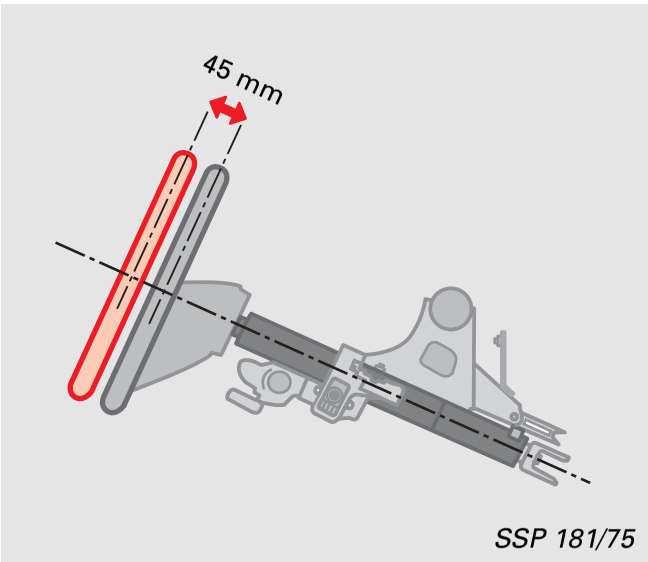
The steering wheel is manually adjustable for reach and height.

- Height adjustment: 44 mm, with indexing mechanism.



SSP 181/44

- Longitudinal adjustment: 45 mm, via clamping.



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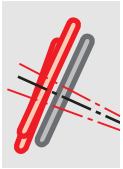

Simultaneous height and longitudinal adjustment are possible.

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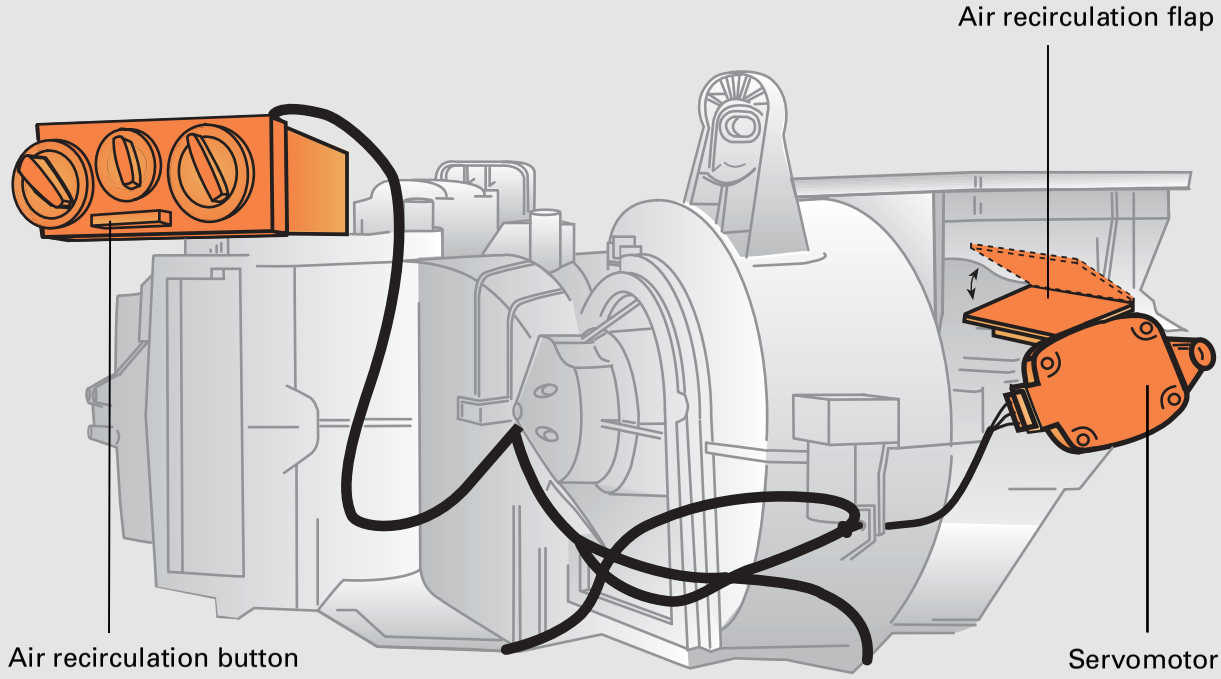
Heating system

Hot and breezy

The heating system with air recirculation mode is controlled at the air intake end.

- The heating system with air recirculation flap is operated electronically via a servo motor
- The other air flaps are actuated mechanically via Bowden cables



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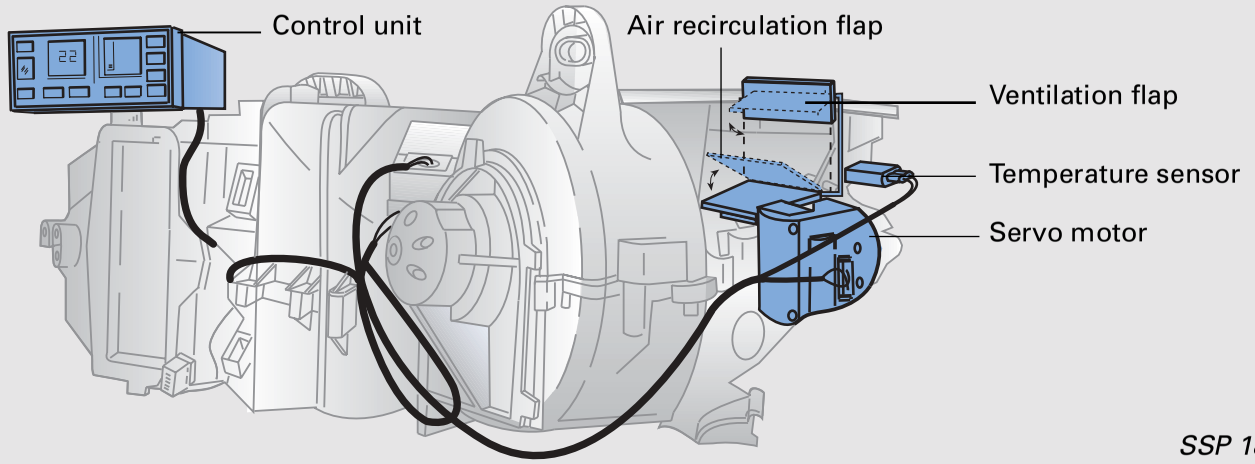
What does air recirculation mode mean?

When you press the Air Recirculation button, the air recirculation flap is closed via the servo motor.
When the air recirculation flap is closed, the air in the interior is recirculated. No outside air is admitted.
The air recirculation button is not functional in Defrost setting.

Well-cooled

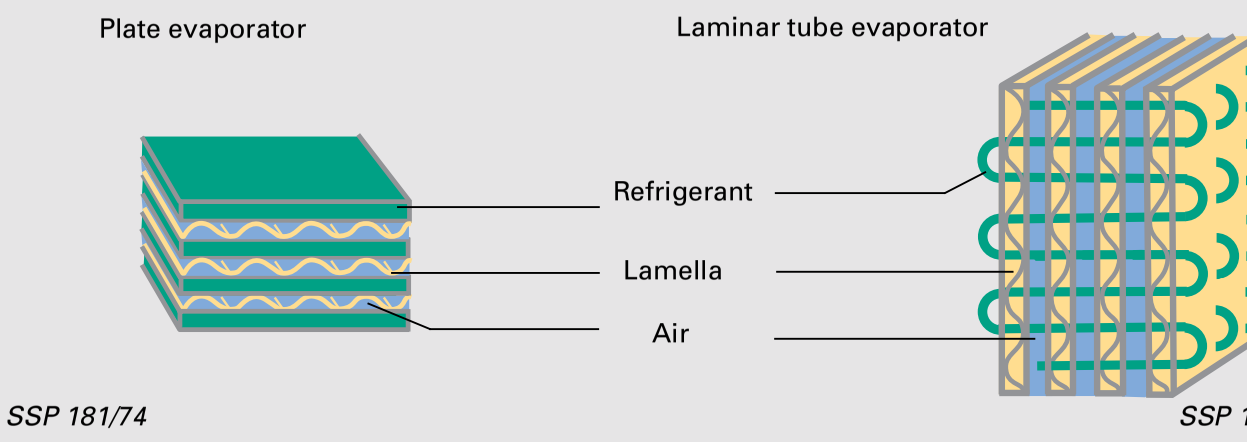
The air conditioning system of the Audi A3 is controlled automatically. You should already be familiar with the function and operation of the air conditioning system, since it is identical to that of the Audi A4.

- The ventilation flap and air recirculation flap are controlled via a common servo motor
- The air flap is controlled via servo motors and 2 temperature sensors
- Plate evaporator



The shape is what matters

While having the same cooling capacity and cooling area as the laminar tube evaporator, the plate evaporator is 40% smaller than the latter.



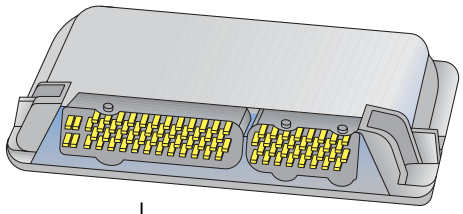
Electrical system

Issues the command

The electrical system is, technically, identical to that of the Audi A4.

The overview shows you the fitting locations of the control units and connection stations.

Engine control unit



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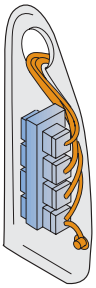
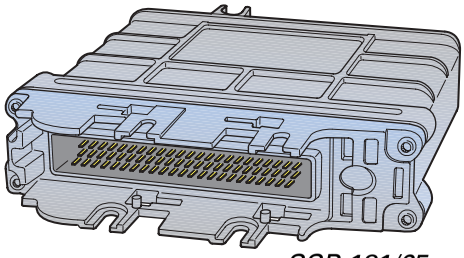
Coupling station of A pillar

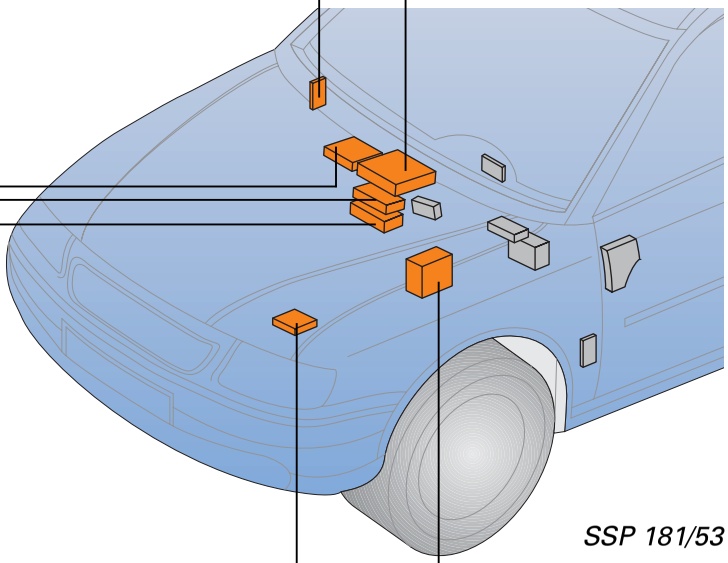


SSP 181/55

Control unit AG 4



SSP 181/65



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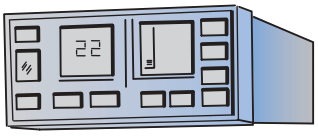
Air conditioning control unit



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Airbag control unit

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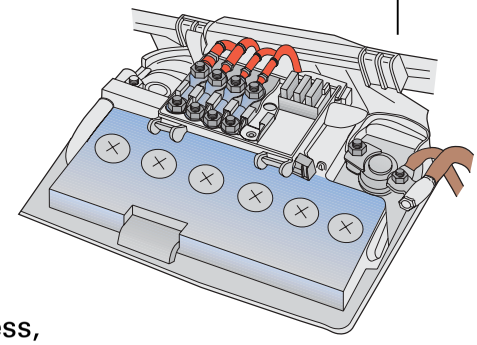
Main fuse box



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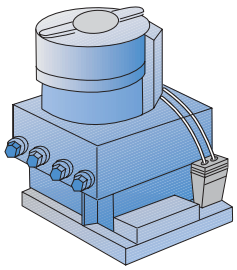
ABS control unit



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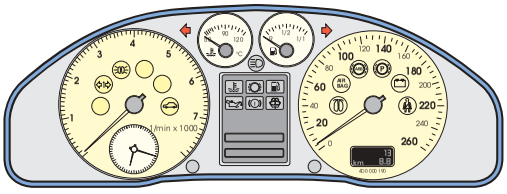
When repairing the wiring harness, use Wiring Harness Repair Kit VAS 1978.
This kit can be used for all VW and Audi vehicles.

Dash panel insert with integrated immobiliser



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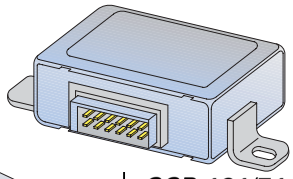
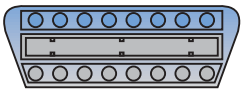
The dash panel insert has self-diagnosis capability and can be read with Service Tester V.A.G. 1551/1552.

Control unit Interior monitoring



SSP 181/71

Diagnosis plug connection



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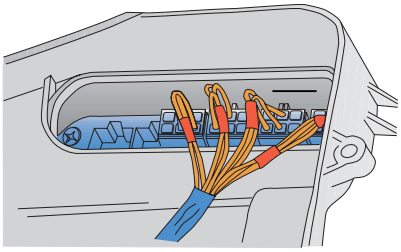
Control unit Anti-theft warning system/central locking

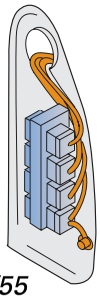
Coupling station of A pillar

Fuse-box

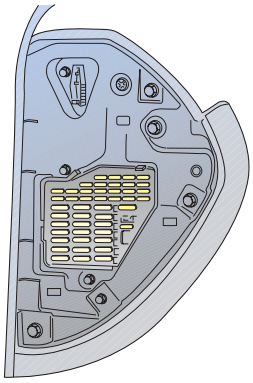
Coupling station



SSP 181/54



SSP 181/55



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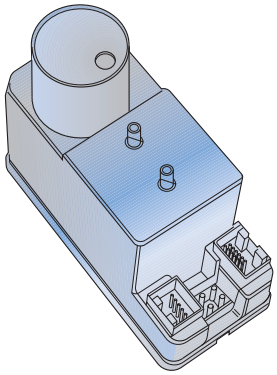

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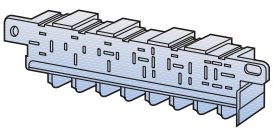
Micro central electrics



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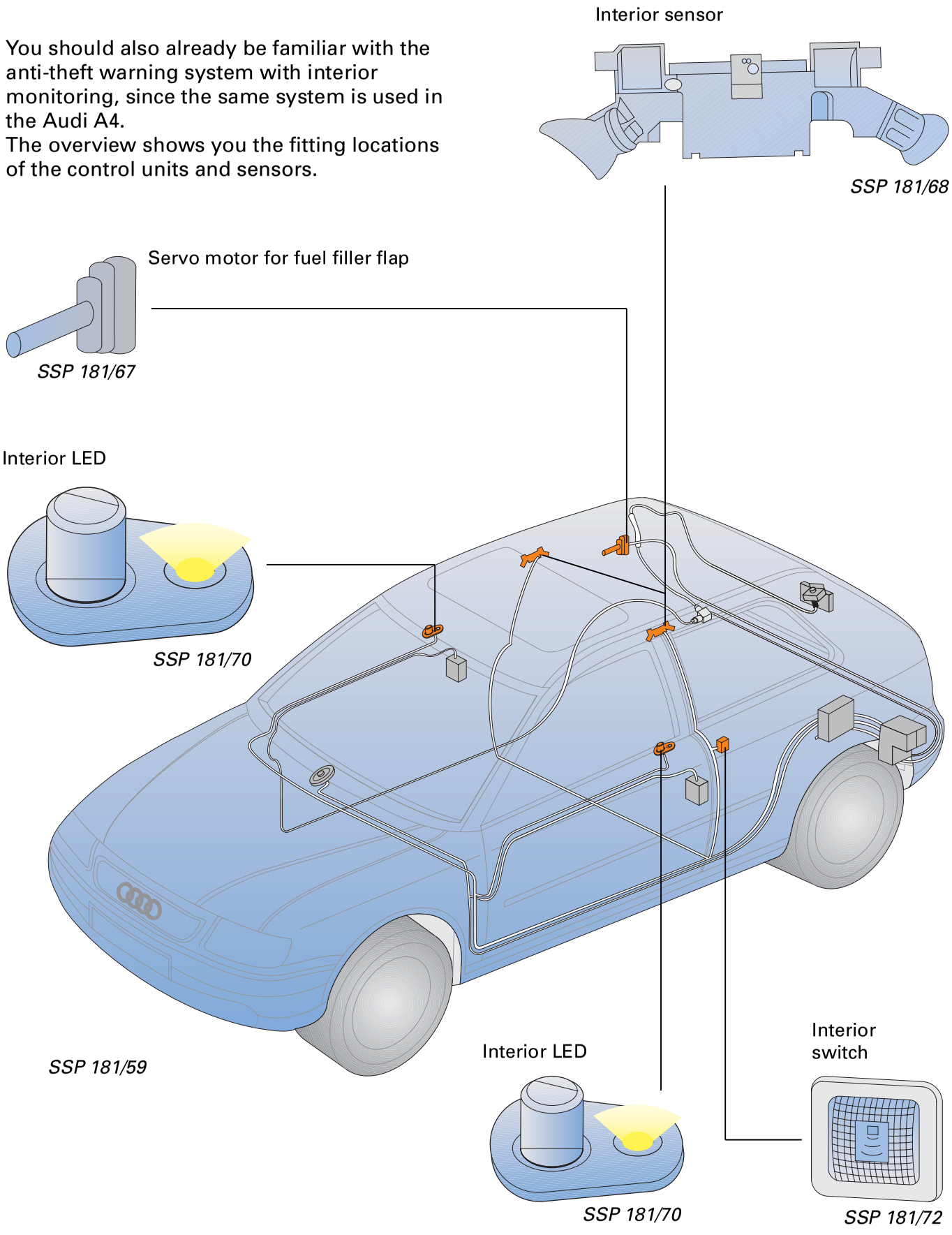
- Dash panel insert with integrated immobiliser
- Pneumatic central locking with radio wave remote control

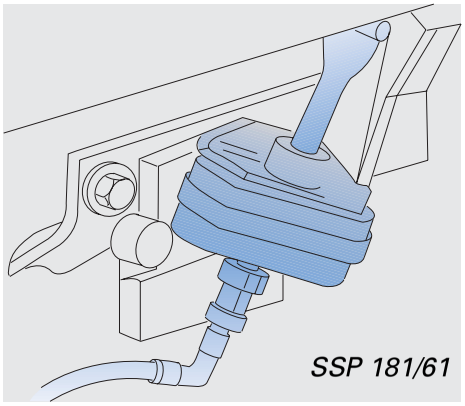
Anti-theft warning system

The minder

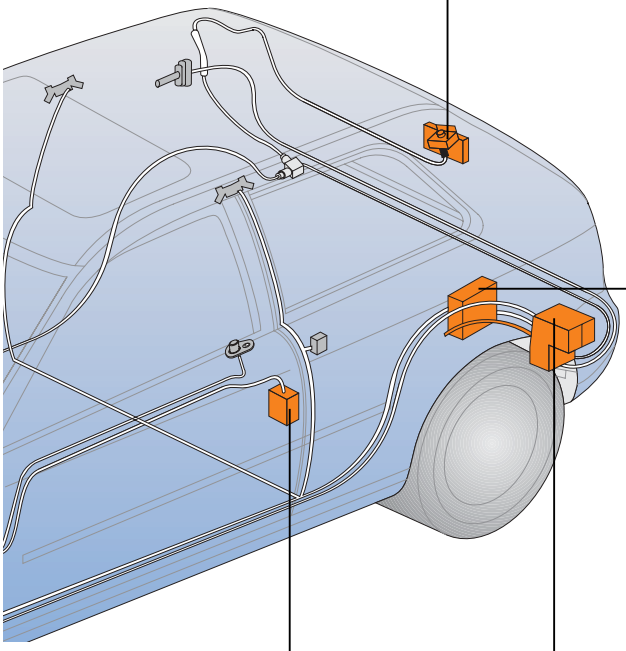
You should also already be familiar with the anti-theft warning system with interior monitoring, since the same system is used in the Audi A4.
The overview shows you the fitting locations of the control units and sensors.



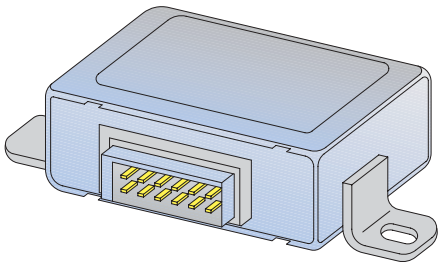
Servo motor
Central locking/Tailgate



SSP 181/61



Control unit
Interior monitoring



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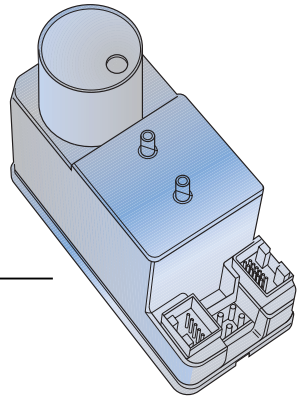
Control unit
Anti-theft warning
system/central locking



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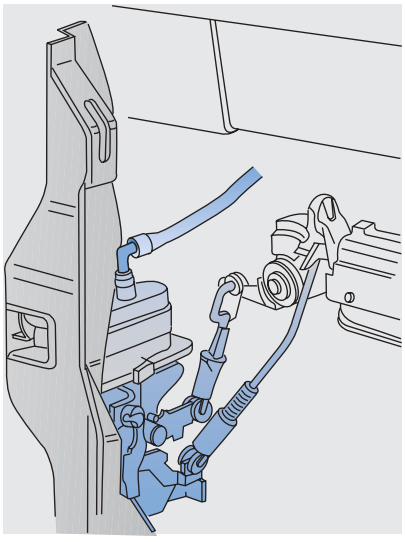
Servo motor
Central locking/
left and right doors



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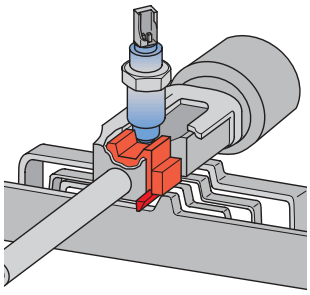
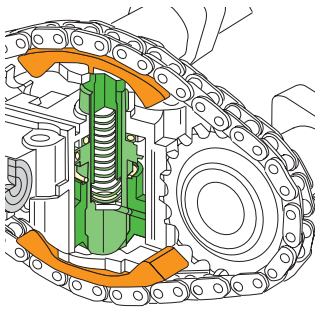
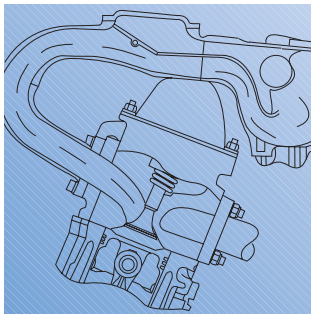
The design and function of the anti-theft warning system and interior monitoring are described in Self-Study Programme 185.



The engineering

Technical Details, see Self-Study Programme 182





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