

The 2.7-litre V6 Biturbo

Design and Function

Self-study Programme 198

All rights reserved. Subject to change.
AUDI AG
Dept. I/GS-5
D-85045 Ingolstadt
Fax +49.841/89-6367
740.2810.17.20
Technical status: 01/98

Printed in Germany

For internal use only

The 2.7-litre V6 biturbo

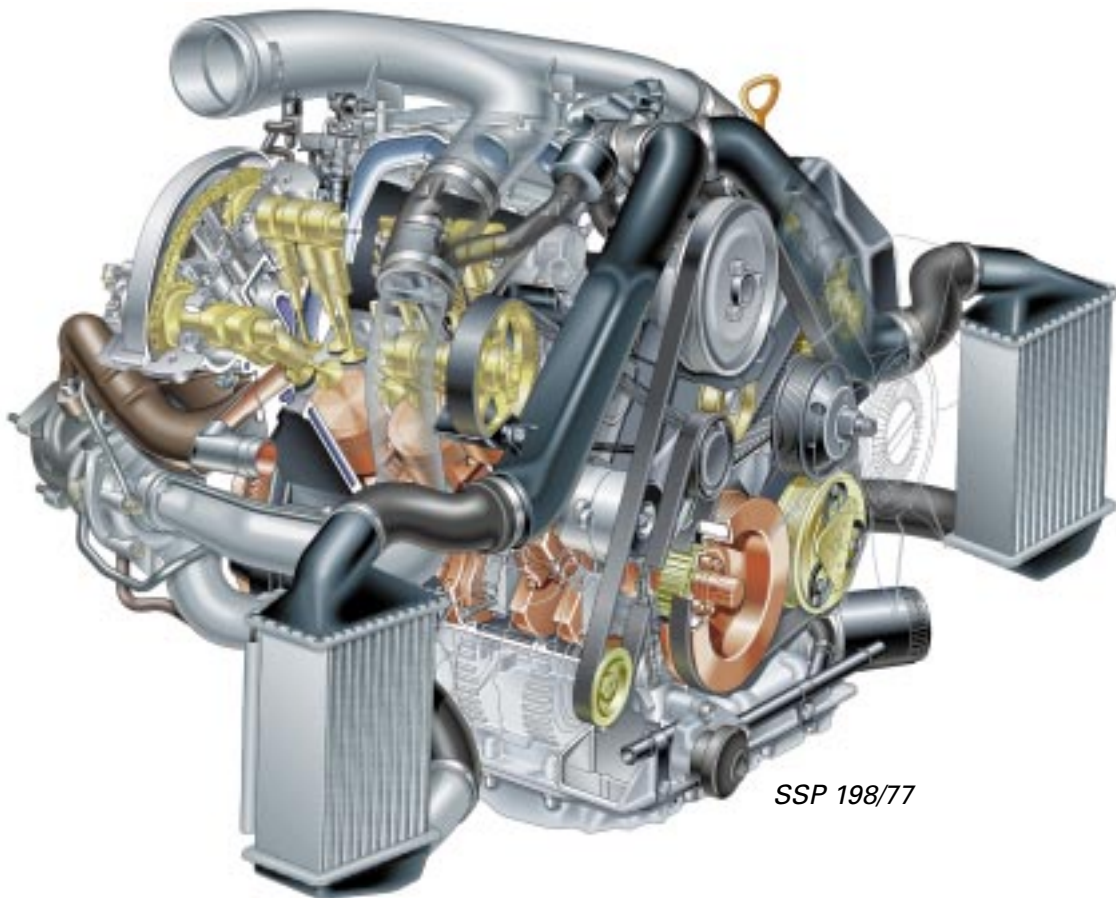
Turbocharged engines are already something of a tradition at AUDI. The task now facing AUDI's engineers was to develop a worthy successor to the 5-cylinder turbocharged engine.

One of the key development goals for the turbocharged engine was to achieve a good level of dynamic response, particularly at the bottom end of the rev band.

The goal of AUDI's engineers was to realise a high "basic torque level" and a torque characteristic that rises in direct proportion to engine speed to its peak.



The term "basic torque level" describes the torque which is immediately available when the throttle is opened (e.g. at part throttle or in overrun).



SSP 198/77

..... a further milestone in engine development by Audi!

	Page
Engine	4
Technical data, crankshaft, cylinder head, camshaft timing, cooling circuit, engine lubrication, overview of components, air ducting, charging, exhaust system, pneumatically controlled systems, charge pressure control, air divert control in overrun, ACF system, crankcase breather	
Motronic ME 7.1	31
Subfunctions, system overview	
Subsystems of the Motronic	33
Torque-oriented engine management, torque-oriented functional structure, Electronic throttle, exhaust gas temperature control	
Sensors	49
Additional sensors of the Motronic	
Auxiliary signals/interfaces	57
Functional diagram	62
Self-diagnosis	64
Vehicle diagnosis, test and information system VAS 5051, test box V.A.G 1598/31	
Transmission	66
Self-adjusting clutch, gearbox	

This Self-study Programme provides you with information regarding design and function.



New!

The Self-study Programme is not a Workshop Manual!



Important!/Note!

Please refer to the Service Literature for all the relevant maintenance and repair instructions.

Engine

The 2.7-litre V6 biturbo

This engine will also be used in the Audi S4 and Audi A6.

The engine used in the A6 has a comfort-oriented setup, which means that it has different torque and power output.

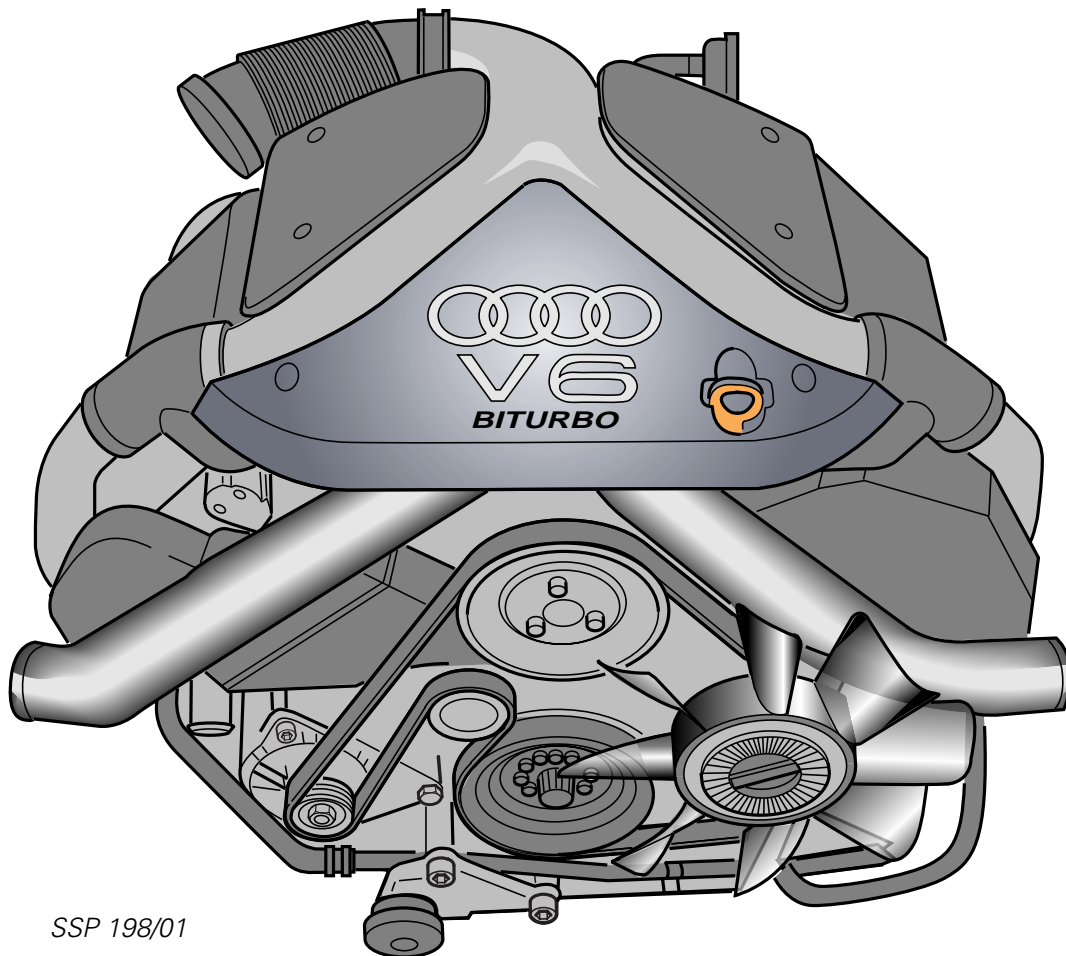
This effect was principally achieved by modifying the software configuration of the engine control unit.



A tuning protective device prevents the S4 engine control unit being installed in the A6!

This prevents misuse, which can result in damage to the drivetrain!

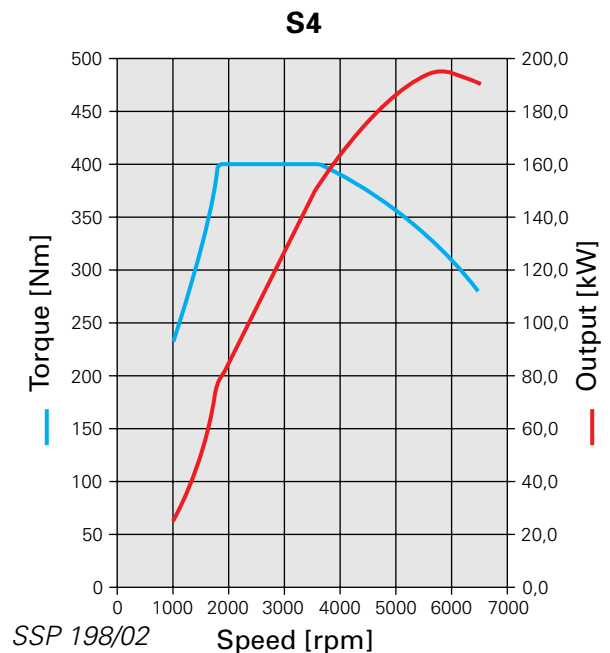
An auxiliary heater is not available as an option for the S4 and the A6, due to the constraints on space.



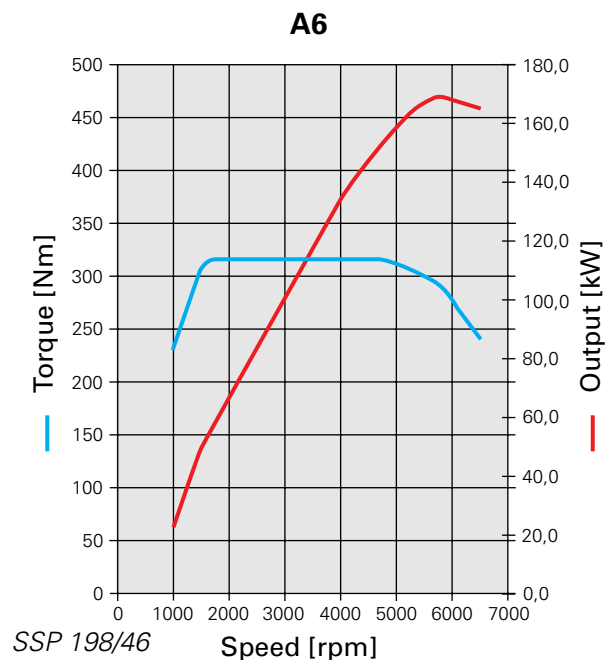
SSP 198/01

The technical data

- **Configuration:**
V6 engine with 90° V-angle and twin turbochargers
- **Engine code:**
S4: AGB
A6: AJK
- **Output:**
S4: 195 kW at 5800 rpm
A6: 169 kW at 5800 rpm
- **Torque:**
S4: 400 Nm at 1850 to 3600 rpm
A6: 310 Nm at 1700 to 4600 rpm
- **Maximum speed:**
6800 rpm
- **Compression ratio:**
9.3 : 1
- **Displacement:**
2671 cm³
- **Bore:**
81 mm
- **Stroke:**
86.4 mm
- **Weight:**
approx. 200 kg
- **Engine management:**
Motronic ME 7.1
- **Firing order:**
1-4-3-6-2-5
- **Fuel type:**
S4: 98/95/91 RON
A6: 95/91 RON
- **Compliant with emission standard:**
EU III-D



Figures obtained using 98 RON unleaded premium fuel to 89/491/EEC.



Figures obtained using 95 RON unleaded premium fuel to 89/491/EEC.



Engine

The crankshaft

The crankshaft is identical to that used in the 2.8-litre V6 engine.

The crankshaft bearing caps are attached to the central crankcase by 4 bolts.

- The 4-bolt connection reduces the load on the bearing caps considerably.

The middle two crankshaft bearing caps are also bolted to the side of the crankcase.

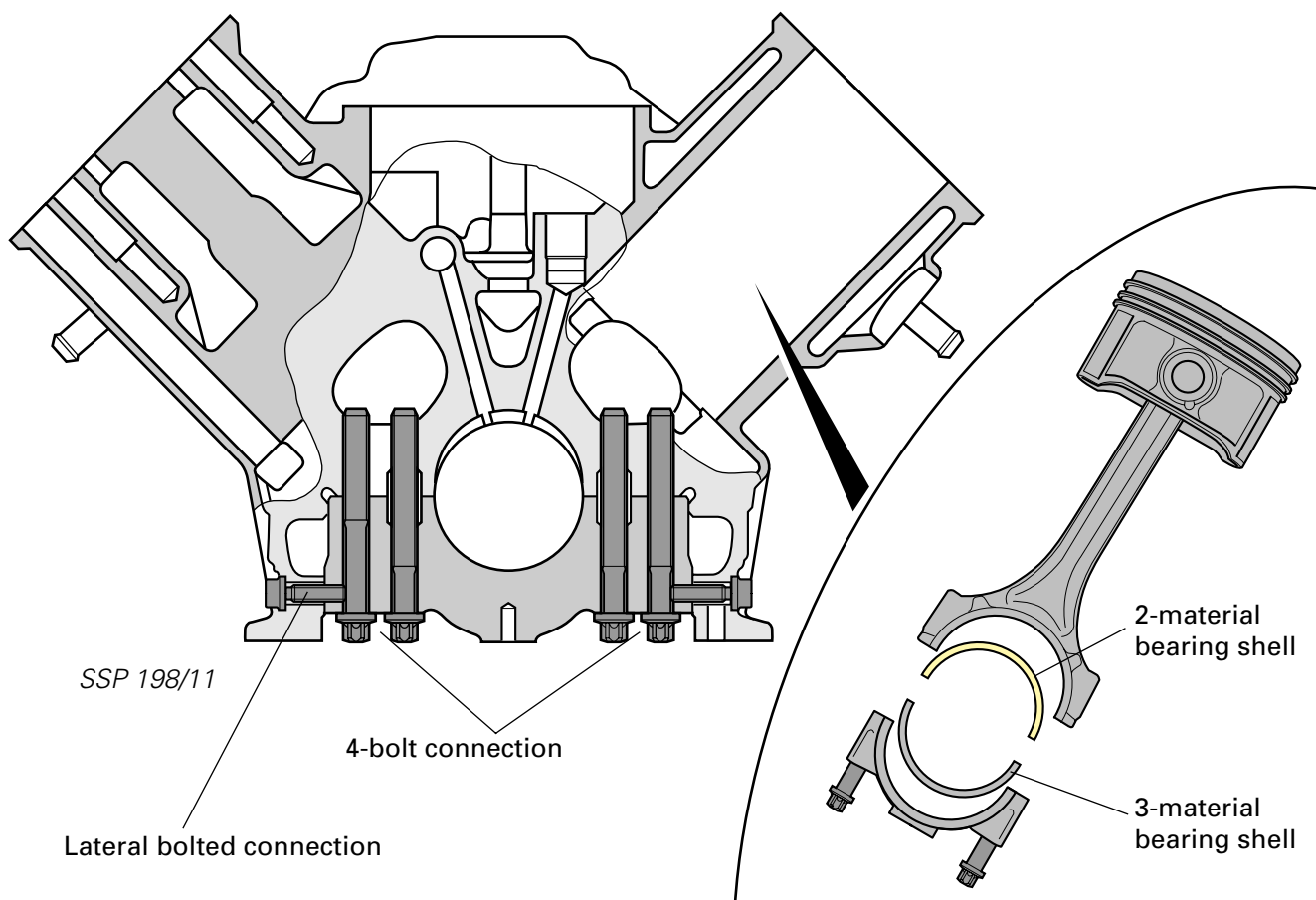
- The lateral bolted connection helps to improve acoustics.

The pistons are forged to enable them to withstand the high loads to which they are subjected.

Due to the high combustion pressures, a 2-material bearing shell is installed on the connecting rod side. The bearing cap has a 3-material bearing shell.

Advantage:

The bearing shell has a high load-bearing capacity



Cylinder head

The cylinder heads are largely identical to those used in the V6 naturally aspirated engine. Common parts are used for both banks of cylinders.

The mounting position of the right-hand cylinder head is rotated through an angle of 180° in relation to the left-hand cylinder head.

The timing of the inlet camshafts is engine-dependent.

To improve heat dissipation, the exhaust valves are sodium-filled.

The shape of the inlet duct causes the drawn-in air to tumble.

Advantages:

- A good degree of swirl and high ignitability fuel-air mixture are achieved
- The tumble effect allows more efficient combustion

For a turbocharged engine, the compression ratio of 9.3 : 1 is high.

Advantage:

- High "basic torque level" and fuel economy



Tumble duct

In combination with five-valve-per-cylinder technology, the inlet duct is shaped as a so-called "tumble duct".

