

2. Test specifications

<u>Test step</u>	<u>Test specifications*</u>
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2.1 Electric fuel pump:

Fuel delivery:	min. 800 cm ³ /min.
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2.2 Fuel pressure:

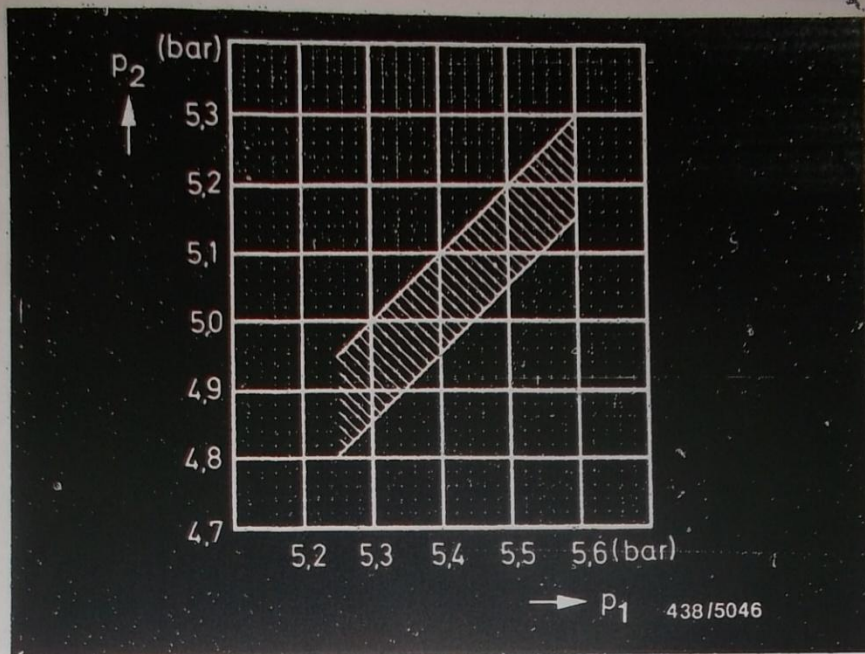
Primary pressure:	5.25 ... 5.6 bar (5.35 ... 5.7 kgf/cm ²)
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* Pressure are indicated in the table of test specifications in bar (gauge pressure) and/or in kgf/cm² (gauge pressure).

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Test specifications
Audi/VW 4-cyl. USA/Japan 66 kW/90 PS





p_1 = Primary pressure

p_2 = Lower-chamber pressure, controller current = 0 mA

Differential pressure:
(Primary pressure/lower-chamber pressure)

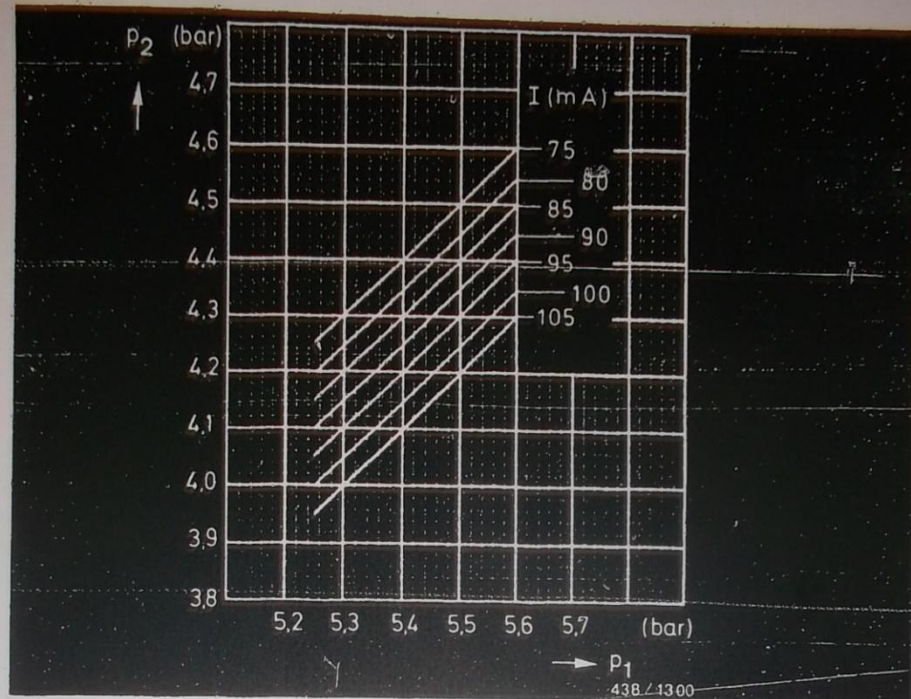
Take the "warm" lower-chamber set-value pressure from the graph in accordance with the measured primary pressure.

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Test specifications

Audi/VW 4-cyl. USA/Japan 66 kW/90 PS





p_1 = Primary pressure

p_2 = Lower-chamber pressure "cold". Tolerance ± 0.15 bar

I = Controller current

Take the "cold" lower-chamber set-value pressure from the graph in accordance with the measured primary pressure and the measured controller current. The "cold" state is simulated by removing the plug from the temperature sensor (NTC).

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Test specifications

Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



Test step

Test specifications*

2.3 Testing the fuel system as a whole for leaks:

Min. pressure after 10 min: 2.7 bar (2.8 kgf/cm²)
after 20 min: 2.6 bar (2.7 kgf/cm²)

2.4 Fuel injection valves:**

Opening pressure 3.0 ... 4.1 bar
(3.1 ... 4.2 kgf/cm²)

2.5 Checking the fuel distributor:**

(Checking with pressure actuator attached.
Actuator current 10 mA)

Comparative measurement of fuel deliveries from outlets:	Setting point	Max. allowable fuel delivery
Idle:	6.0 cm ³ /min	6.6 cm ³ /min
Part load:	40.0 cm ³ /min	42.5 cm ³ /min
Full load:	91.0 cm ³ /min	100.0 cm ³ /min

The full-load delivery is a minimum value which must be achieved at each outlet with maximum deflection of the air-flow sensor plate.

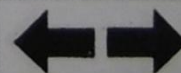
Flow rate for
KE throttle in fuel distributor: 130...145 cm³/min

* Pressures are indicated in the test specifications in bar (gauge pressure) and/or kgf/cm² (gauge pressure).

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Test specifications

Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



**** Note on the part number for the fuel-injection valve:**

The fuel-injection valves installed in this engine have the part number 0 437 502 026 (original equipment) or .. 027 (sales designation). These valves have an air-guide cap firmly pressed on (for the air shrouding system). For replacements, order valves with the above sales designation .. 027 and not in accordance with the designation .. 023 as stamped on the valve stem. Connection for the tester for comparison of fuel delivery using adapter sleeves KDJE-P 200/19.

Test step

Test specifications

2.6 Temperature sensor

Measurements of resistance:

Engine cold, ambient temperature (+15°C...+30°C): 1300 ... 3600 Ω

Engine at normal operating temperature (approx. +80°C): 250 ... 390 Ω

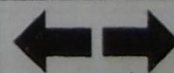
2.7 Auxiliary-air device

Resistance of heater winding: 30 ... 65 Ω

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Test specifications

Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



2.8 Thermotime switch

Resistance measurements:

Measurements of resistance between			
at a temperature	Term. "G" and ground (housing)	Term. "W" and ground (housing)	Term. "G" and Term. "W"
below +30°C	25...40 Ω	0 Ω	25...40 Ω
above +40°C	50...80 Ω	100...160 Ω	50...80 Ω

Test step

Test specifications

2.9 Air-flow sensor potentiometer:

Voltage signal with
air-flow sensor plate
in basic position:

0.01 ... 0.05 V

2.10 Basic setting of
idle-mixture-adjusting
screw (fuel distributor
seat - needle bearing):

18.8 \pm 0.1 mm

2.11 Idle adjustment:*

Idle speed:

800...1000 min⁻¹

Exhaust gas setting:
Testing of the pressure
actuator trigger current:

Checking value

= 4 ... 16 mA

Setting

= 9 ... 11 mA

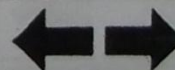
CO-level (check value)

= 0.3 ... 1.2 vol. %

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Test specifications

Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



Rapid diagnostic chart for the universal test adapter ETT 018.01

Test step	Switch setting V Ω	But- ton	Object tested	Test con- nec- tions	Test conditions	Test speci- fications (reading)
1	4 ↓	-	Pressure actuator - internal resistance	12 - 10	Disconnect control unit plug.	21 ... 25 Ω
2	5 ↓	-	Temperature sensor - internal resistance +15°C...+30°C approx. +80°C	21 - 2	Control unit plug disconnected.	1.3 ... 3.6 kΩ 0.25 ... 0.39kΩ
3	4	-	Starting signal Term. 15a - starting motor	24 - 2	Control unit plug disconnected. Activate starting motor:	8 ... 15 V
4	6	-	Control unit - power supply	1 - 1	Control unit plug disconnected. Switch on ignition:	8 ... 15 V
5	7	-	Power supply Potentiometer on air-flow sensor	18 - 2	Connect the control unit. Switch on the ignition:	7 ... 8 V
6	8	-	Signal - potentiometer on air-flow sensor	17 - 2	Connect the control unit. Switch on the ignition. Deflect the air-flow sensor plate by hand, causing rise in voltage to max. 8 V.	0 ... 8 V

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Rapid diag. chart for univ. test adapter
Audi/VW 4-cyl. USA/Japan 66 kW/90 HP



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Rapid diag. chart for univ. test adapter
Audi/VW 4-cyl. USA/Japan 66 kW/90 HP



Rapid diagnostic chart for the universal test adapter ETT 018.01

Test step	Switch setting V Ω	But- ton	Object tested	Test con- nec- tions	Test conditions	Test specifi- cations (reading)
7	14	-	Lambda control Closed-loop control operation	23 - 2	Control unit connected. Jump sockets 1 and 2 on the test adapter. Start the engine and warm it up. Closed-loop control operation: Pulsing vol- tage reading. Average value:	approx. 3 V
8	-	1	Warm-up enrichment -20°C	12 - 12	Measurement of current! Connection for tester: Negative - black socket 1 Positive - black socket 2 Connect control unit. Switch on the ignition:	52 ... 72 mA
9	-	2	Actuator current corresponding to engine at normal operating tempera- ture	12 - 12	Control unit connected. Switch on the ignition:	9 ... 11 mA
10	-	1/4	Post-start enrichment	12 - 12	Control unit connected. Switch on the ignition. Hold down button 1: Press button 4. Current increases to: When button 4 is released, cuts after a brief time back to: Cutback time:	52 ... 72 mA 130 ... 150 mA 52 ... 72 mA approx. 90 s

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Rapid diag. chart for univ. test adapter
Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



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Rapid diag. chart for univ. test adapter
Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



Rapid diagnostic chart for the universal test adapter ETT 018.01

Test step	Switch setting		But-ton	Object tested	Test connec-tions	Test conditions	Test speci-fi-cations (reading)
11	V	Ω	1	Acceleration enrichment	12 - 12	Control unit connected. Switch on the ignition. Hold down button 1. Value for current: Deflect the air-flow sensor plate rapidly. Current rises to: Cuts back in approx. 1 second to:	52 ... 72 mA 130 ... 150 mA 52 ... 72 mA
12	-	24	-	Lambda closed-loop control	12 - 12 8 - 2	Control unit connected. Start the engine, warm it up and operate it at idle speed. Closed-loop control operation of the lambda control can be identified from the pulsing of the reading for current. Average value: If average value is not within tolerance, adjust to:	4 ... 16 mA 9 ... 11 mA
13	-	22	-	Lambda closed-loop control - full load correction	12 - 12 8 - 2	Control unit connected. Switch on the ignition. Current rises to:	max. 20 mA
14	-	23	-	Lambda closed-loop control - lean stop	12 - 12 8 - 2	Control unit connected. Switch on the ignition. Current drops to:	less than 2 mA

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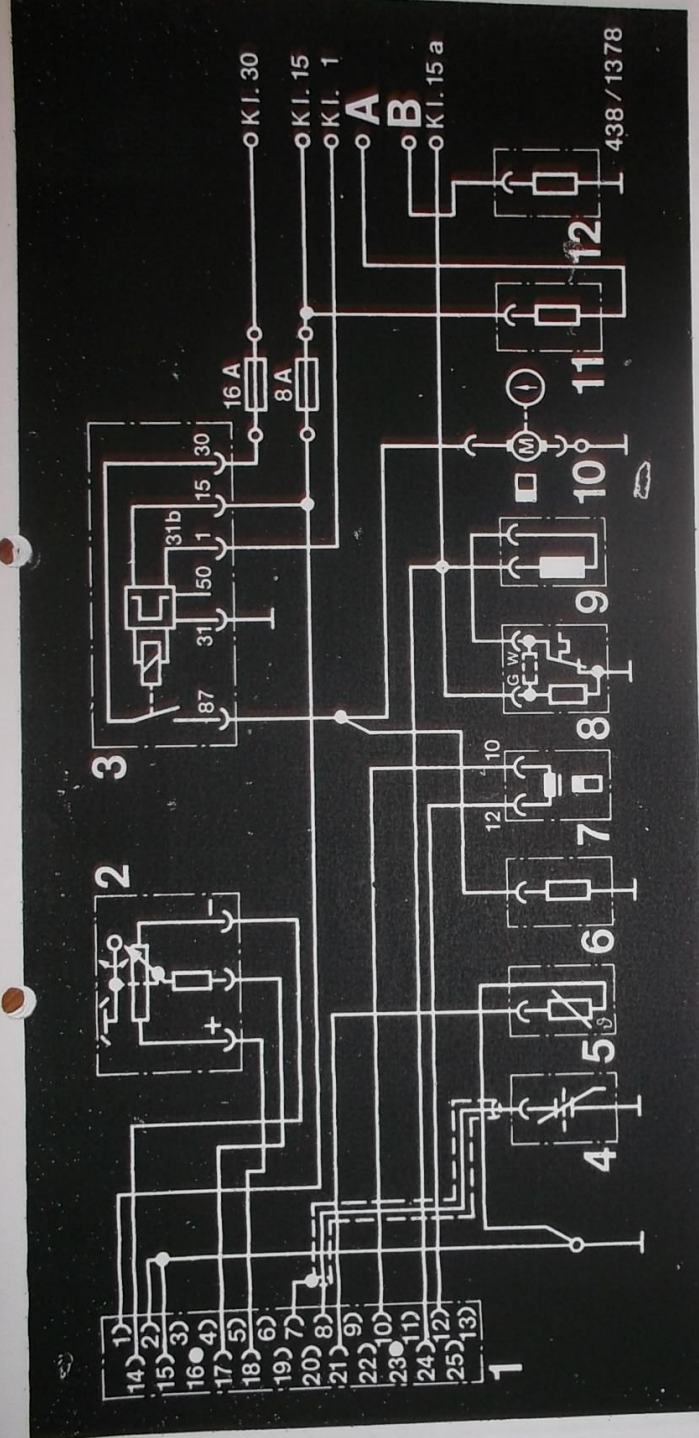
Rapid diag. chart for univ. test adapter.
Audi/VW 4-cyl. USA/Japan 66 kW/90 HP



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Rapid diag. chart for univ. test adapter
Audi/VW 4-cyl. USA/Japan 66 kW/90 HP





4. Electrical wiring diagram for the KE-Jetronic with safety circuit and idle increase

- | | |
|--|--|
| 1 = Control unit | 9 = Cold-start valve |
| 2 = Air-flow sensor potentiometer | 10 = Electric fuel pump |
| 3 = Electronic speed relay | 11 = Idle increase valve 1 |
| 4 = Lambda sensor | 12 = Idle increase valve 2 (only with air conditioner) |
| 5 = Temperature sensor (NTC) | A = Ground signal from control relay (in relay base) for speed increase. Switch-on point below 700 min ⁻¹ , switch-off point above 1050 min ⁻¹ . |
| 6 = Auxiliary-air device | B = Positive signal from air conditioner |
| 7 = Electrohydraulic pressure actuator | |
| 8 = Thermotime switch | |

4.1 Jumping the electrical safety circuit

For all pressure and fuel-delivery tests, the electrical safety circuit must be jumped. The electric fuel pump and auxiliary-air device are supplied with voltage via the electronic speed relay of the safety circuit.

Installation position of speed relay for Audi:

In the central electrical unit, in the engine compartment in front of the windshield, on the left looking in the direction of forward vehicle travel, white relay.

Installation position for VW:

In the central electrical unit, on the left looking in the direction of forward vehicle travel, below the instrument panel.

To jump the circuit, disconnect the relay and jump the connecting sockets 30 and 87 in the relay base with an auxiliary lead. Equip the auxiliary lead with a fuse element and a 16 A fuse. Width of the blade terminal: 9.5 mm.

Important instruction:

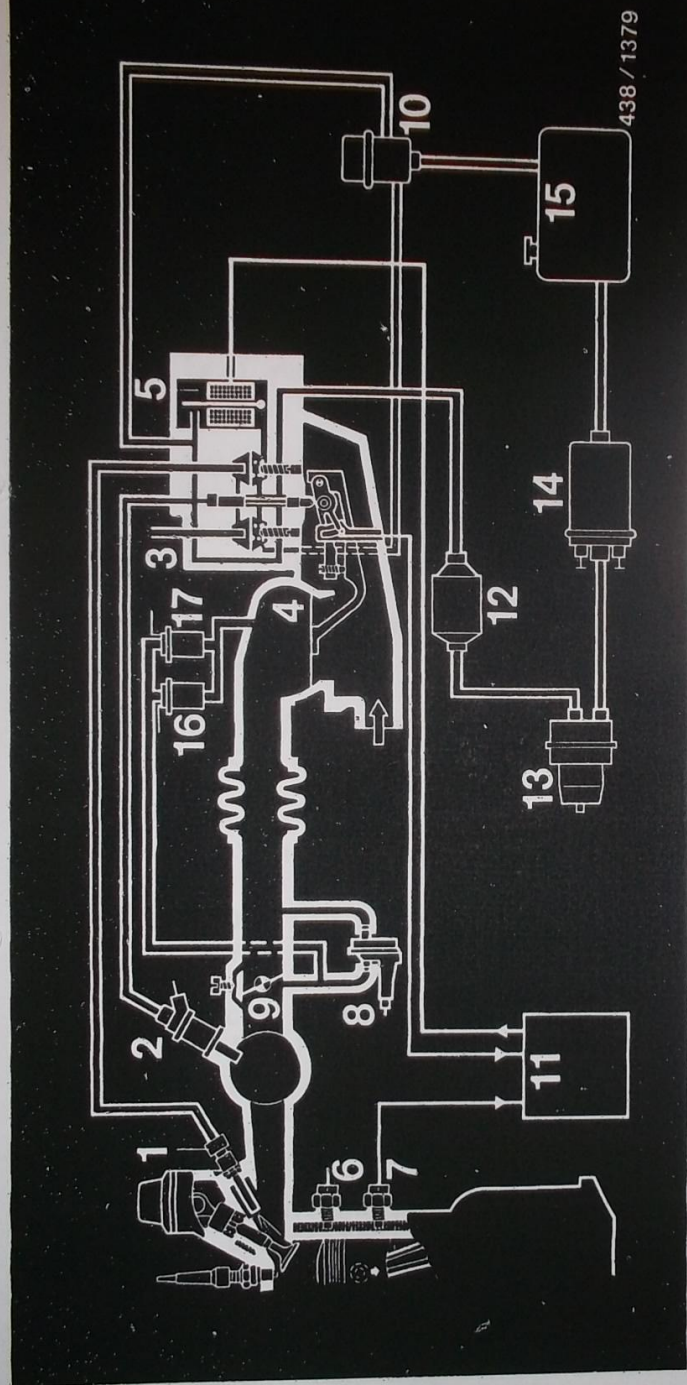
Never deflect (raise) the air-flow sensor plate while the electric fuel pump is running, otherwise fuel will be injected via the fuel-injection valves. If the engine is then started, serious damage to the engine may result.

For all electrical tests, only switch on the ignition!

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Jumping the safety circuit
Audi/VW 4-cyl. USA/Japan 66 kW/90 PS





5. Fuel line diagram and air paths for the KF-Jetronic

- 1 = Fuel-injection valve
- 2 = Cold-start valve
- 3 = Fuel distributor
- 4 = Air-flow sensor
- 5 = Electrohydraulic pressure actuator
- 6 = Thermostime switch
- 7 = Temperature sensor (NTC)

- 8 = Auxiliary-air device
9 = Throttle valve
10 = Pressure regulator (primary pressure)
11 = Control unit
12 = Fuel filter
13 = Fuel accumulator
14 = Electric fuel pump

- 15 = Fuel tank
16 = Idle increase valve 1
17 = Idle increase valve 2
(only with air conditioner)

6. General Safety Instructions for Work on Vehicles with KE-Jetronic

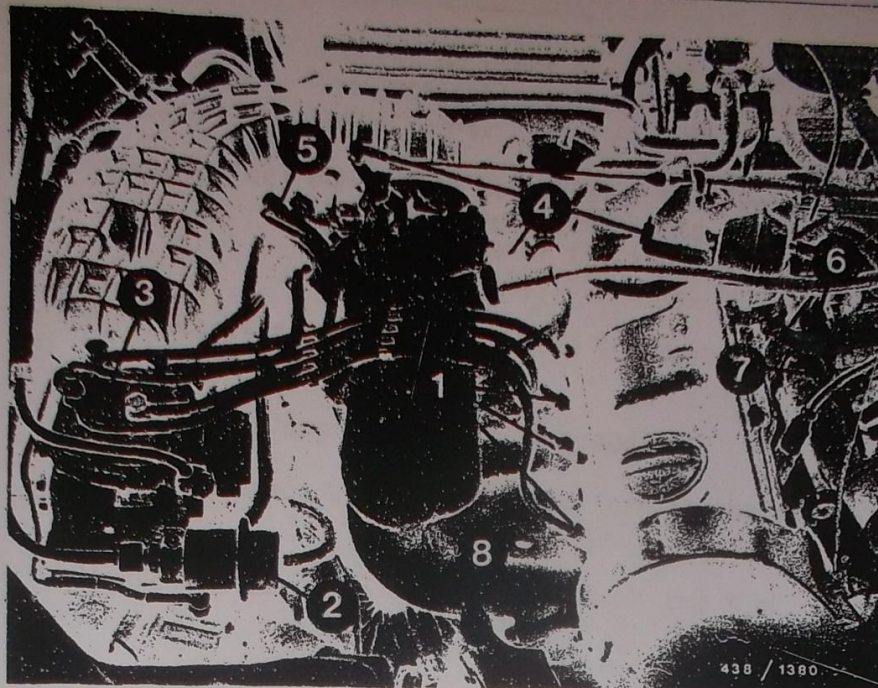
- While testing with the electric fuel pump operating, never deflect (raise) the air-flow sensor plate since fuel will be injected through the injection valves. When the engine is subsequently started, this may lead to serious engine damage.
- Observe the instructions on test media when testing the injection valves with the valve tester. Never use normal gasoline or other easily inflammable liquids. Even when using test gasoline, observe the local safety regulations.
- Leak test on engine intake system only with allowable leak-detector spray. (E.g. Gypoflex). Do not use any easily inflammable liquids. Observe local safety regulations.
- Never start the engine without securely connected battery.
- Never disconnect the battery from the vehicle electrical system with the engine running.
- When fast-charging the battery, disconnect it from the vehicle electrical system.
- Remove the KE-Jetronic control unit at temperatures above +80°C (paint-drying installation).
- Before performing electrical welding work (e.g. spot welding), remove the KE-Jetronic control unit.
- Make sure that all wiring-harness connectors are securely connected.
- Never disconnect or connect the wiring-harness plug of the control unit with the ignition on.

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General safety instructions

Audi/VW 4 Cyl. USA/Japan 66 kW/90 HP (DIN)





- 1 = Fuel-injection valves
- 2 = Primary-pressure regulator
- 3 = Mixture-control unit
- 4 = Auxiliary-air device (not visible, below throttle-valve assembly)
- 5 = Cold-start valve
- 6 = Thermotime switch
- 7 = Temperature sensor (not visible, on underside of valve assembly)
- 8 = Connection tube for exhaust-gas measurements

7. Installation position of components

7.1 Installation position for Audi (longitudinal installation)

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Installation position of components
Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



Control unit: Mounted on right of glove compartment, and accessible only after removal of glove compartment.

Electric fuel pump, fuel accumulator and fuel filter: The fuel supply components are mounted on the underside of the vehicle in the area in front of the rear axle.

7.2 Installation position for VW (transverse installation):

Component on engine:	As for Audi.
Mixture-control unit:	On the left in the engine compartment.
Control unit:	In the radiator tank, on the left looking in the direction of forward vehicle travel.
Fuel filter:	In the engine compartment, on the left, next to the mixture-control unit.
Electric fuel pump with pressure-side pressure damper:	Flange-mounted directly on the fuel tank.
Fuel accumulator:	Above the rear axle on the left.

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Installation position of components
Audi/VW 4-cyl. USA/Japan 66 kW/90 PS



1. Special features

These brief SIS instructions apply to the following vehicles:

Audi 4000 (USA)	11.83 →
Audi 80 (Japan)	9.83 →
VW Jetta/Rabbit (USA)	7.84 →
VW Golf (Japan)	1.84 →

Engine: 4-cyl./1.8 l, 66 kW/90 PS. Longitudinal installation for Audi, transverse installation for VW.

The KE-Jetronic system in these models corresponds to the basic version, but with a reduced number of functions:

Without full-load enrichment, without altitude sensor, without overrun cutoff. The throttle valve switch idle/full load is omitted.

Special equipment:

- Lambda closed-loop control.
- Fuel-injection valves with stationary air guide caps for air shrouding. (Note the special connection system for the tester for delivered quantity comparison.)
- Solenoid valve (2 valves with air conditioning) in air system for idle increase.

Basic microcard for detailed trouble-shooting in mechanical/hydraulic section: SIS-AUD 507. This also applies to the detailed test chart for the electronic functions; the test steps for unused functions should be ignored.

Important note:

In the case of references to a basic microcard, it should be noted that the test specifications should always be taken from the brief instructions for the specific vehicle concerned.

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Special features

Audi/VW 4-cyl. USA/Japan 66 kW/90 PS

