SELF-DIAGNOSIS

SELF-DIAGNOSIS TECHNICAL DATA

Memories	
• Brief memory	yes
• Permanent memory	no
Data output	
• Flash code output	yes
• Rapid data transmission	no
Final control element diagnosis	yes

FUNCTION

FEI control unit -J88 is equipped with self-diagnosis. If malfunctions occur in monitored sensors or components, these are stored in fault memory with a description of fault type.

After evaluation of the data, the FEI control unit differentiates between 14 different faults (see Fault Table on page 01-48). Fault memory is erased by switching off ignition.

In addition, the FEI control unit is equipped with a final control element diagnosis for 4 final control elements.

Notes:

- Final control element diagnosis can only be carried out if engine is not running.
- On the other hand, recalling of the fault memory should be carried out with engine running, if possible.

TEST CONDITIONS

- Voltage supply of FEI control unit OK - checking - Repair Group 28
- Fuel pump OK - checking - Repair Group 20.
- Fuel pump relay OK - checking - page 01-28
- Fuses OK - see current flow diagram
- Earth connections between engine compartment, intake manifold, ignition coil power stage and bolted-on parts OK.
- Air conditioner switched off.

LIST OF FEI CONTROL UNIT FAULT CODES

Flash code or indication on V.A.G 1551 (Fault codes)	Following faults are stored in the FEI control unit
0000	Output end
1111	Control unit defective
2111	Engine speed sender -G28
2112	Ignition timing sender -G4
2113	Hall sender -G40
2121	Idle switch -F60
2123	Full throttle switch -F81
2141	First knock control
2142	Knock sensor 1 -G61
2214	Rpm above maximum
2221	Intake manifold pressure
2222	Intake manifold pressure sender -G71
2224	Boost pressure above maximum
2312	Coolant temperature sender -G62
2322	Intake air temperature sender -G42
4444	No faults found

A - RECALLING FAULT MEMORY WITH FAULT READER V.A.G 1551 IN OPERATING MODE 2 - FLASH CODE OUTPUT

- Observe test conditions - page 01-2

- Carry out test drive of at least 5 minutes.
  During this
  - coolant temperature must reach at least 80° C,
  - engine speed must be increased to above 3000 rpm,
  - boost pressure must rise to above 1 bar,
  - accelerator pedal must be depressed all the way for a short period.

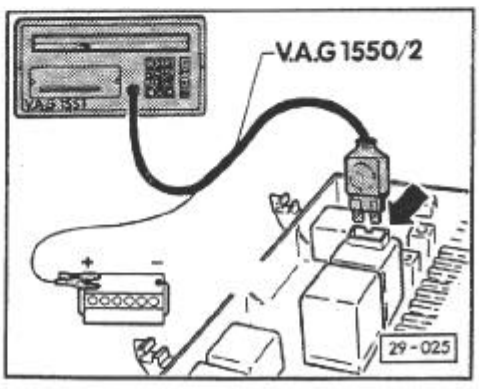
- Run engine at idle.

Note:

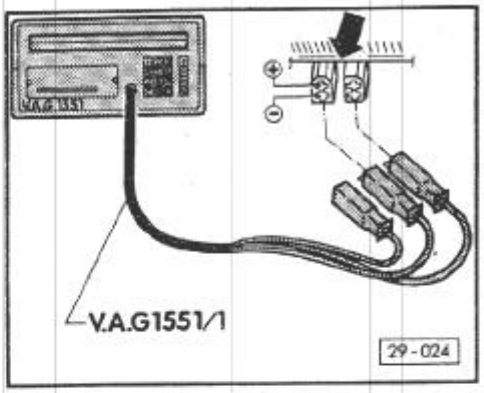
If engine does not start, operate starter approx. 5 seconds without switching off ignition afterwards.

- Vehicles without diagnosis plugs

- Remove fuse box/relay plate cover.



- Connect fault reader V.A.G 1551 with lead V.A.G 1550/2 to vehicle battery (+) or to B+ on alternator and on fuel pump relay - arrow.



• Vehicles with diagnosis plugs

- Connect fault reader V.A.G 1551 to diagnosis plugs in driver's side footwell with diagnosis lead V.A.G 1551/1 as follows.

- Connect black plug to diagnosis plug (black)

- White plug to diagnosis plug (brown).

- Blue diagnosis plug is not required.

```
V.A.G - SELF-DIAGNOSIS      HELP
    1 - Rapid data transmission*
    2 - Flash code output*
```

Display indicates:

* Appears alternately

Note:

• Additional operating information can be recalled with Help button of V.A.G 1551-
• ➞ button continues program flow.

- Switch on printer with Print button (operating lamp in button lights up).

- Press button 2 for "Flash code output" operating mode.

```
Initiate flash code output
with " ➞ " button
```

Display indicates:

- Briefly press ➞ button. Stored faults or flash codes are indicated on display and printed by printer.

Note:

If printer is not ready for operation, press ➞ button until Flash code 0000 output end appears on display.

```
Flash code: 4444
No faults found
```

If no fault is stored, display indicates:

After indication of last fault or after Flash code 4444 No faults found.

```
Flash code: 0 0 0 0
Output END
```

Display indicates:

- Switch off ignition. Locate and eliminate fault using fault table - page 01-18

- After eliminating fault, carry out another test drive of at least 5 minutes and recall fault memory again.

8 - FINAL CONTROL ELEMENT DIAGNOSIS WITH V.A.G 1551 IN OPERATING MODE 2 - FLASH CODE OUTPUT

Notes:

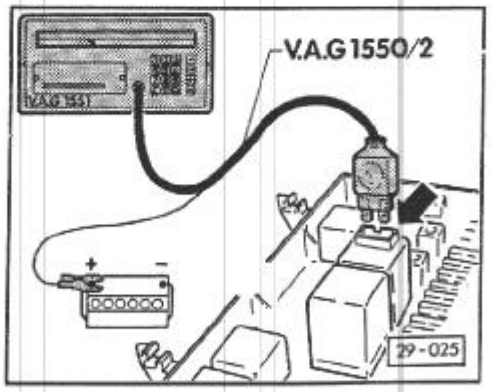
- Final control element diagnosis can only be carried out if engine is not running.
- During the diagnosis the cold start valve -N17 is only activated for 10 seconds.
- The diagnosis is terminated if engine is started or rpm impulse is detected.
- Operation of control elements is checked acoustically or by touch during diagnosis. For this it must be quiet in area near vehicle.
- Apart from the fuel pump relay -J17 all other control elements click.
- If a valve does not click, check the valve and/or activation - pages 01-28 to 01-35.
- Element diagnosis can only be repeated after switching off the ignition

Activation sequence:

Flash code	Control element
4433	Fuel pump relay -J17
4441	Frequency valve for Lambda control (control valve) -N7
4442	Solenoid valve for boost pressure limitation -N75
4443	Cold start valve -N17

Initiating final control element diagnosis

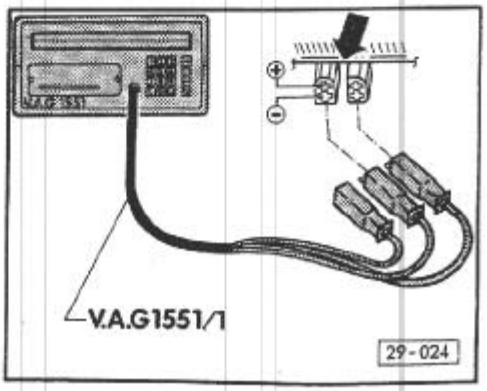
- Ignition on



- Vehicles without diagnosis plugs

- Take cover off fuse box

- Connect V.A.G 1551 with lead V.A.G 1550/2 to vehicle battery (+) or to B+ on generator and to fuel pump relay -arrow-.



- Vehicles with diagnosis plugs

- Connect V.A.G 1551 with diagnosis lead V.A.G 1551/1 to diagnosis plugs in footwell on driver's side as follows.

- Black plug to black diagnosis plug

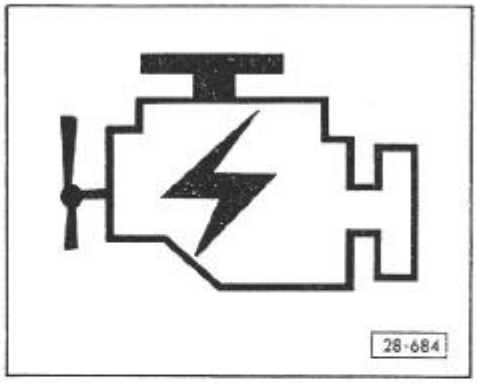
- White plug to brown diagnosis plug

- Blue plug is not used.

V.A.G - SELF DIAGNOSIS HELP 1 - Rapid data transmission* 2 - Flash code output*	◄ Display indicates:
	* appear alternately
	- Switch printer on with Print button (lamp on button lights up).
	- Press button 2 for operating mode "Flash code output"
Initiate flash code output with " ➡ " button	◄ Display indicates:
Permanent earth short on stimulus lead	◄ - Press button ➡ until Permanent earth short on stimulus lead appears on display
	- Switch ignition on.

	- Briefly press ➡ button.
Flash code: 4433 Fuel pump relay - J17	◄ Display indicates:
	Fuel pump relay must operate and fuel pump must run.
	If fuel pump relay does not operate, check activation - page 01-28.
	Note:
	After checking relay -J17, pull fuse No. 13 out.
	- By pressing button ➡ all final control elements are activated one after the other.
	Note:
	The individual control elements with the exception of the cold start valve -N1/ are activated (click) until check is switched to the next control element by pressing ➡ button.
	- After checking the last control element, cold start valve -N17, insert fuse No. 13 again.
	- Switch ignition off.

C - RECALLING FAULT MEMORY WITH FUSE AND FAULT LAMP



Reading flash code

Reading flash code on fault lamp in dash panel insert.

When ignition is switched on, fault lamp must light up.

If no fault is present which could lead to engine damage, fault lamp goes out after engine is started.

When recalling fault memory, fault lamp must flash.

When recalling fault memory, faults can be read with flash code. During final control element diagnosis, respective final control unit is indicated with flash code.

- Each flash code consists of 4 flashing pulse groups of max. 4 flashing pulses. Between each flashing pulse there is a pause (fault lamp off) of approx. 2.5 seconds.

  By adding together individual flashing pulses within flashing pulse groups (each flashing pulse group results in a figure between 1 and 4), differing flashing codes are read with fault lamp.

For fault elimination, all possible flash codes are listed in fault table on page 01-18.

For flash codes of final control element diagnosis, see control sequence - page 01-15.

During fault memory recall and final control diagnosis, display of various flashing codes runs as follows.

After start signal (fault lamp on) and subsequent pause (fault lamp off) of 2.5 seconds respectively, transmission of flashing pulses within 4 flashing pulse groups of respective flash codes follows.

After transmission of 4th flashing pulse group, pause of approx. 2.5 seconds follows. Then start signal of respective flash code is repeated until next memory location or next component is called up during final control element diagnosis.

Recalling fault memory with fuse and fault lamp (in dash panel insert)

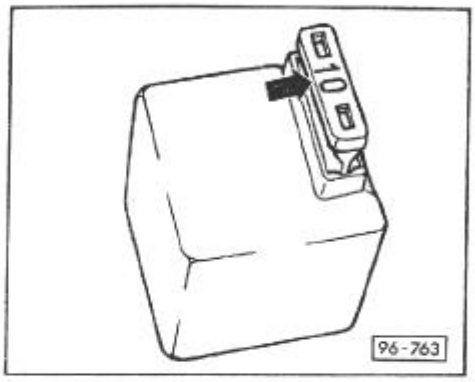
- Observe test conditions - page 01-2

- Carry out test drive of at least 5 minutes.
  During this
  - coolant temperature must reach at least 80° C,
  - engine speed must be increased to above 3000 rpm,
  - boost pressure must rise to above 1 bar,
  - accelerator pedal must be briefly depressed all the way.

- Run engine at idle.

Note:

If engine does not start, operate starter approx. 5 seconds without switching off ignition afterwards.



- Link contacts on fuel pump relay (J 17) for at least 4 seconds with fuse.

  Lighting up of fault lamp in dash panel insert must change into flashing after fuse is removed.

- Count and note flashing pulses.

Note:

- Respective flash code is repeated until unit is switched to next memory location of fault memory by linking contacts on fuel pump relay again. Flash code fault table - see page 01-18.
- If flash code 4 4 4 4 is shown, no fault is stored and test is completed.

Otherwise:

- Link contacts on fuel pump relay again, count and note flashing pulses.

- Since several faults can be stored, repeat test until flash code 0 0 0 0 (fault output END) appears.

- Switch on ignition, eliminate faults using fault table - page 01-18.

- After eliminating faults carry out another test drive of at least 5 minutes and recall fault memory again.

D - FINAL CONTROL ELEMENT DIAGNOSIS WITH FUSE AND FAULT LAMP

Notes:

- Final control element diagnosis can only be carried out if engine is not running.
- During the diagnosis the cold start valve -N17 is only activated for 10 seconds.
- The diagnosis is terminated if engine is started or rpm impulse is detected.
- Operation of control elements is checked acoustically or by touch during diagnosis. For this it must be quiet in area near vehicle.
- Apart from the fuel pump relay -J17 all other control elements click.
- If a valve does not click, check the valve and/or activation - pages 01-28 to 01-35.
- Reading flash codes on fault lamp - page 01-11.
- Element diagnosis can only be repeated after switching off the ignition.

Activation sequence:

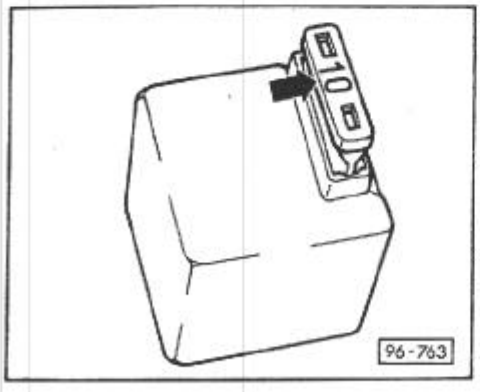
Flash code	Final control element
4433	Fuel pump relay -J17
4441	Frequency valve for Lambda control (control valve) -N7
4442	Solenoid valve for boost pressure limitation -N75
4443	Cold start valve -N17

Initiating final control element diagnosis

Note:

After initiation of control element diagnosis the fault lamp shows which element is currently being activated from the FEI control unit.

- Switch ignition on.



- Bridge contacts on fuel pump relay -J17 for at least 4 seconds with a fuse.

The fuel pump relay must operate and the fuel pump must run.

If the relay does not operate - check activation - page 01-28.

Note:

After checking the fuel pump relay -J17, take out fuse No. 13.

- Then bridge contacts on fuel pump relay for at least 4 seconds with a fuse again.

- By the bridging of the contacts on the fuel pump relay all control elements will be activated one after the other in the activation sequence - see page 01-15.

Note:

The individual final control elements, with the exception of the cold start valve -N17 are activated (click) until unit is switched to the next element by the bridging of the contacts on the fuel pump relay.

- After checking the last control element, cold start valve -N17, insert fuse again.

- Switch ignition off.

FAULT TABLE

- All possible faults which can be detected by FEI control unit -J88 are listed below.
- If defective components are found, also check leads to components for short circuit and breaks in wiring using current flow diagram.
- Before eliminating fault or replacing components, check earth connection of FEI control unit -J88 using current flow diagram (checking voltage supply - Repair Group 28), and check earth points on engine for corrosion and damage.

Flash code or indication on V.A.G 1551		Fault cause	Effects	Fault elimination
1111	Control unit defective	Computer in FEI control unit -J88		Renew FEI control unit -J88
2111	Engine speed sender -G28	- Metal particles on -G 28 - Retaining base on -G 28 loose - Distance from -G 28 to starter ring greater than 1.25 mm - Broken teeth on starter ring	- Engine does not start - Ignition failure - Engine stalls	- Check distance from flywheel/ drive plate to engine speed sender - Repair Group 13
		- Break in wiring or short circuit between 3-pin plug in engine compartment and -G 28 - 3-pin connector from -G 28 and firing point sender -G 4 reversed - G 28 defective - Input for -G 28 in FEI control unit -G 88 defective (FEI control unit defective)	- Engine does not start	- Check engine speed sender -G 28 - Repair Group 28

Flash code or indication on V.A.G 1551		Fault cause	Effects	Fault elimination
2112	Firing point sender -G 4	- Retaining base of -G 4 loose - Distance from -G 4 to pin on starter ring greater than 1.25 mm - Pin on flywheel bent or broken	- Fault before engine start-up: engine does not start	- Check distance from pin to firing point sender - Repair Group 13
		- Break in wiring or short circuit between 3-pin plug in engine compartment and -G 4 - 3-pin connector from -G 4 and engine speed sender -G 28 reversed - G 4 defective - Break in wiring or short circuit between FEI control unit -J 88 and -G 4 - Input for -G 4 in FEI control unit -J 88 detective (FEI control unit defective)	- Fault after engine start-up: flashing code 2112 is stored - Engine does not start	- Check firing point sender -G 4 - Repair Group 28

Flash code or indication on V.A.G 1551		Fault cause	Effects	Fault elimination
2113	Hall sender -G 40	- No supply voltage for -G 40 from -J 88 - No earth for -G 40 - Break in signal lead to -J 88 or signal lead short circuited to earth - Short circuit between contact -25 and -27 on -J 88 - Break in wiring between 3-pin connector in engine compartment and -J 88 - G 40 defective - Input for -G 40 in -J 88 defective -J 88 defective)	- Fault before engine start-up: engine does not start - Fault after engine start-up: flashing code 2113 stored	- Check Hall sender -G 40 - Repair Group 28
		- Position of -G 4 pin		- See flash code 2112
		- Toothed belt jumped		- Checking - Repair Group 13 - Basic setting for ignition distributor - Repair Group 28
		- Adjustment of -G 40		- Checking - Repair Group 28

Flash code or indication on V.A.G 1551		Fault cause	Effects	Fault elimination
2121	Idling switch G 60	- Throttle cable adjustment	- Idling regulation done by control - Idling speed not within specified range	- Check throttle cable adjustment - Repair Group 20
		- Adjustment of-F 60 - Break in wiring or short circuit in idling switch or in cable - Mechanical: sticking of idling switch		- Check and adjust idling switch F 60 - Repair Group 25
2123	Full throttle switch F 81	- Adjustment of - F 81 - Short circuit or break in wiring in full throttle switch - Mechanical sticking of full throttle switch		- Check and adjust full throttle switch F 81 - Repair Group 25
2141	First knock control	- Poor fuel quality, less than 98 RON	- Slight loss of power - Slightly increased fuel consumption - Top speed is not reached	- Fill tank with 98 RON petrol
		- Abnormal engine noises (auxiliary components loose)	- Engine runs unevenly	- Check security of auxiliary components and engine mounts
		- Break in wiring of screening for -G 61		- Locate and eliminate break in wiring using current flow diagram
		- Knock control module in FEI control unit -J 88 (-J 88 defective)	- Higher fuel consumption - Lack of power	- Renew FEI control unit -J 88

Flash code or indication on V.A.G 1551		Fault cause	Effects	Fault elimination
2142	Knock sensor G 61	- G 61 loose	- Higher fuel consumption - Lack of power	- Tightening torque 10 Nm
		- Break in wiring or short circuit between - G 61 and FEI control unit J 88		- Locate and eliminate break in wiring or short circuit using current flow diagram
		- G 61 defective		- Renew knock sensor G 61
		- Input for G 61 in FEI control unit defective -J 88 defective		- Renew FEI control unit J 88
2214	Rpm above maximum	- Engine speed too high, engine was over-revved.	- Fuel pump relay -J17 is switched off by FEI control unit -J88	- Inform customer
2221	Intake manifold pressure	- Vacuum hose between intake manifold and FEI control unit -J 88 has fallen off, is cracked or defective	- No boost pressure control	- Check vacuum hose
2222	Intake manifold pressure sender - G /1	- Intake manifold pressure sender -G /1 in FEI control unit -J 88 defective	- No boost pressure control	- Renew FEI control unit -J 88

Flash code or indication on V.A.G 1551		Fault cause	Effects	Fault elimination
2224	Boost pressure above maximum	- Dump valve defective - Hose between dump valve and solenoid valve for boost pressure control -N 75 fallen off, cracked or defective	- Fuel pump relay -J 17 switched off by FEI control unit -J 88	- Check boost pressure -Repair Group 21 - Check hose
2312	Coolant temperature sender -G62	- Break in wiring or short in sender lead - G 62 defective	- Cold start difficulties at very low temperatures - Engine runs unevenly in warm-up phase	- Check coolant temperature sender -G 62 - Repair Group 28
2322	Intake air temperature sender - G 42	- Break in wiring or short in sender lead - G 42 defective		- Check intake air temperature sender -G 42 - Repair Group 28
4444	No faults found	• If a complaint exists, fault not detected by Self-diagnosis	- Continue fault finding with defect tables "Engine fault finding" binder	
0000	Output End			

ELECTRICAL TESTING

Notes:

- Use multimeter V.A.G 1526, diode test lamp V.A.G 1527 and leads from V.A.G 1594 for test purposes.
- If the measured readings deviate from the specified figures, locate and eliminate faults using the current flow diagram. Before renewing any components check the wiring and connections and, particularly in the case of specified values under 10 Ω, repeat the resistance measurement on the component.
- Before electrical test, interrogate the Fault memory and carry out final control element diagnosis - see Self-diagnosis.

Caution!

To prevent destruction of electronic components, switch to the appropriate measuring range before connecting test leads.

TEST CONDITIONS

- Battery voltage OK.
- Fuses OK - see Current flow diagram
- Earth connections on engine (intake manifold) OK.

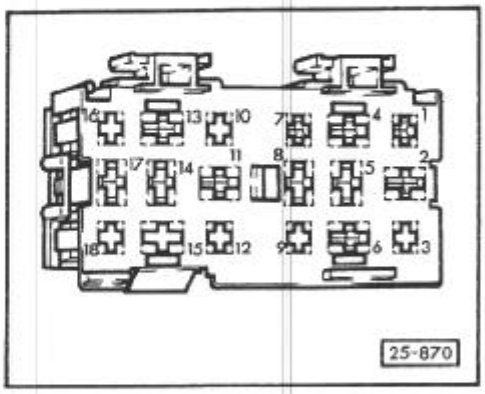
CHECKING ACTIVATION OF CONTROL UNIT FOR IDLE STABILIZATION -J 142

Note:

Use multimeter V.A.G 1526 with leads from V.A.G 1594 and diode test lamp V.A.G 1527 for checking.

- Pull control unit for idle stabilization - J 142 off relay locations 19 and 20 of additional relay holder after removing lower dash trim and A pillar trim.

- Check activation on relay socket as follows:



◄ Connections or contact allocation in relay socket for idle stabilization control unit - J 142.

Test table for idle stabilization control unit

o Connections or contact allocation - Fig. 25-870, page 01-2b

Test step	Contacts in relay socket	Function tested	• Test conditions - Additional work	Specified readings
		- Set DC voltage measuring range -V-		
1	14 + 5	Terminal 15 voltage supply	• Ignition switched on	Approx. battery voltage
2	8 + 5	Idling switch -F60	• Ignition switched on • Throttle valve in idling position • Idling switch closed	Approx. battery voltage
3	8 + 5	Idling switch -F60	• Ignition switched on - Operate idling switch with throttle valve lever or accelerator pedal (open)	0 volts
		- Connect diode test lamp V.A.G 1527 in place of multimeter		
4	17 + 5	Speed signal from FEI control unit -J88	- Operate starter	- Diode test lamp must flicker
5	17 + 5	Speedometer sender -G22	- Switch on ignition - Turn front left wheel (2 ... 3 turns)	- Diode test lamp must light up when turning

- Switch on measuring range: resistance measurement -Ω-				
Test step	Contacts in relay socket	Function tested	• Test conditions - Additional work	Specified readings
6	13 + 5	Temperature sensor -N10	---	Engine cold (approx. 20° C) - approx 600 ... 1000 Ω Engine oil temperature approx. 80° C - approx. 70 ... 150 Ω
7	11 + 4	Idle stabilization valve -N71	Idle stabilization valve OK Checking - Repair Group 25 and connected (plug connected)	2 ... 10 Ω

For vehicles with air conditioner only

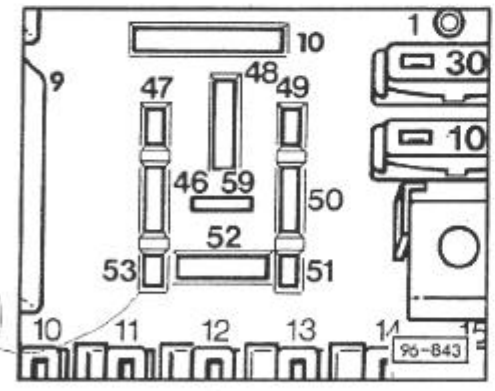
- Switch on DC voltage measuring rage -V-				
8	2 + 5	Positive from operating and indicating unit -E87	- Ignition switched on - Air conditioner on • Operating mode ECON • Fan HI • Temperature setting HI	Approx. battery voltage
9	6 + 5	Positive from air conditioner magnetic clutch -N25	• Ignition switched on • A/C switched on • Operating mode AUTO	Approx. battery voltage

- If readings are not correct, check wiring to components using current flow diagram.
  If no break in wiring or short circuits to components are found, renew appropriate components and repeat check.
- If, despite malfunction, all specified values are attained, renew idle stabilization control unit -J142.

CHECKING ACTIVATION OF FUEL PUMP RELAY -J17

- Remove fuse box/relay plate cover.

- Pull fuel pump relay -J 17 out of relay plate 10.



- Connect multimeter V.A.G 1526 for voltage measurement with leads from V.A.G 1594 as follows:

• Between contacts 46 and 50
• Between contacts 48 and 50

- Switch on ignition.

Specified reading: approx. battery voltage

If reading is not correct, locate and eliminate break in wiring using current flow diagram.

- Connect multimeter between contacts 46 and 47.

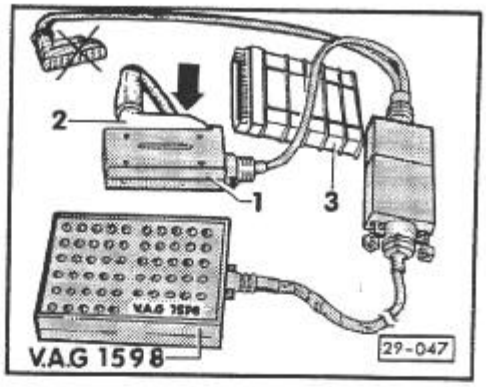
- Briefly operate starter.

Specified reading: approx. 9.5 volts

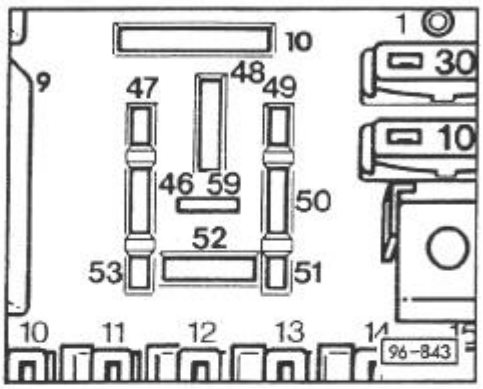
If reading is correct, renew fuel pump relay.

If reading is not correct, check leads as follows:

- Remove FEI control unit and pull plug off with ignition switched off.
(The control unit is behind the A pillar trim in front right footwell).



- Connect test box V.A.G 1598 to detached plug of FEI control unit -2- with adapter lead V.A.G 1598/7 -1-. The contact numbers of plug are identical to test box numbers.
Fuses OK - see current flow diagram.



- Check continuity between relay socket 10 and test box with multimeter.

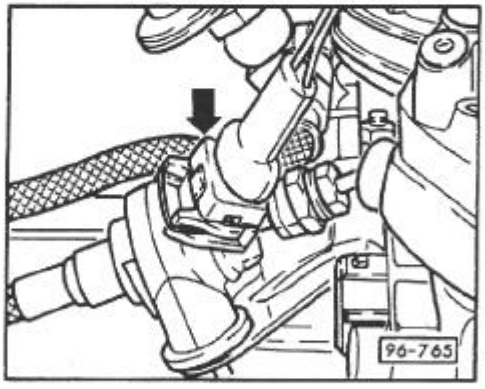
Test box	Relay socket 10
21	47
31	49

Specified reading: max. 1.0 Ω

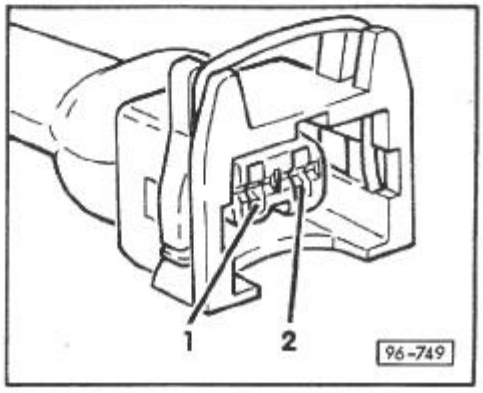
If the readings are not correct, locate and eliminate break in wiring using current flow diagram.

If the readings are correct, renew FEI control unit.

CHECKING ACTIVATION OF FREQUENCY VALVE FOR LAMBDA REGULATION -N73



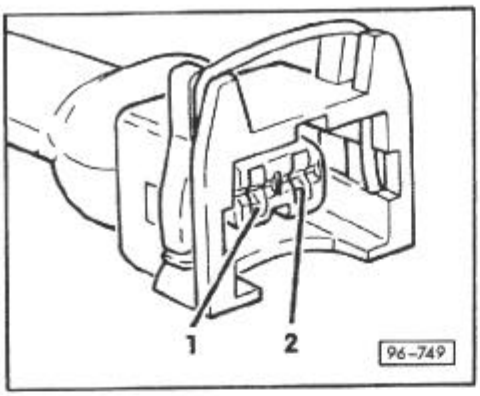
- Disconnect plug from frequency valve for Lambda regulation -N7.



- Connect diode test lamp V.A.G 1527 to contacts 1 and 2 of plug with leads from V.A.G 1594.

- Carry out final control element diagnosis up to activation of frequency valve for Lambda regulation (flash code 4441) - see self-diagnosis.

- LED lights up, renew frequency valve.



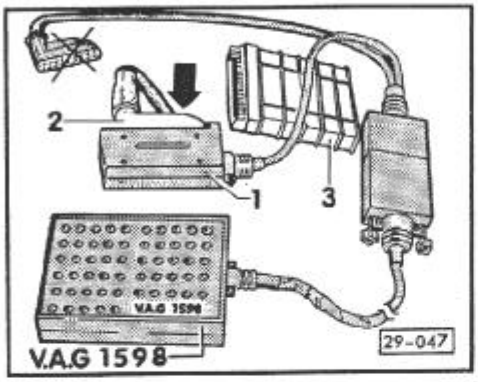
- LED does not light up, connect multimeter V.A.G 1526 for voltage measurement between plug contact 1 and earth with leads from V.A.G 1594.

  Specified reading: approx. battery voltage

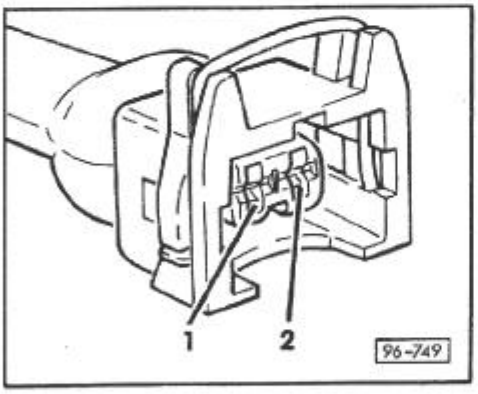
If reading is not correct, locate and eliminate break in wiring using current flow diagram.

If reading is correct, check leads as follows:

- Remove FEI control unit and pull plug off with ignition switched off.
  (The control unit is behind the A pillar trim in front right footwell).



- Connect test box V.A.G 1598 to detached plug of FEI control unit -2- with adapter lead V.A.G 1598/7 -1-.
  The contact numbers of plug are identical to test box numbers.
  Fuses OK - see current flow diagram.



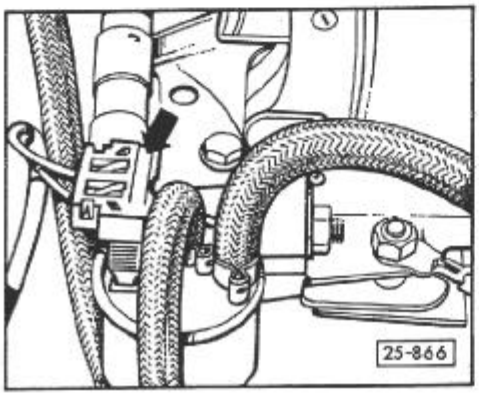
- Check continuity between plug contact 2 and test box contact 8 with multimeter.

  Specified reading: approx. 10 Ω

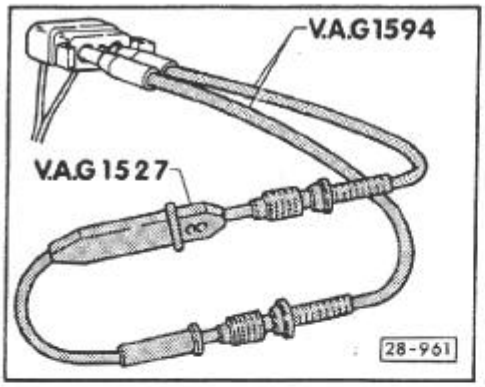
If reading is not correct, locate and eliminate break in wiring using current flow diagram.

If reading is correct, renew FEI control unit.

CHECKING ACTIVATION OF SOLENOID VALVE FOR BOOST PRESSURE CONTROL -N75



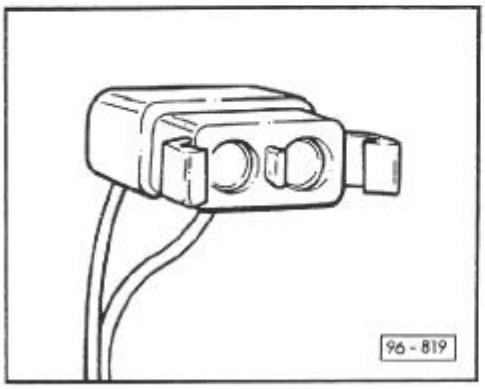
- Disconnect plug from solenoid valve for boost pressure control -N75.



- Connect diode test lamp V.A.G 1527 to plug contacts with leads from V.A.G 1594.

- Carry out final control element diagnosis up to activation of solenoid valve for boost pressure control (flash code 4442) - see self-diagnosis.

- LED flashes, renew solenoid valve for boost pressure control

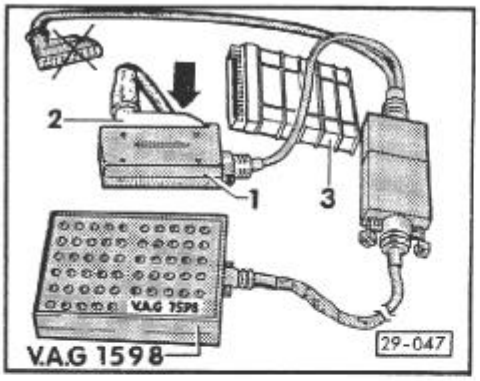


- LED does not light up, connect multimeter V.A.G 1526 for voltage measurement between plug lead (blue/black) of solenoid valve for boost pressure control and earth with leads from V.A.G 1594.

Specified reading: approx. battery voltage

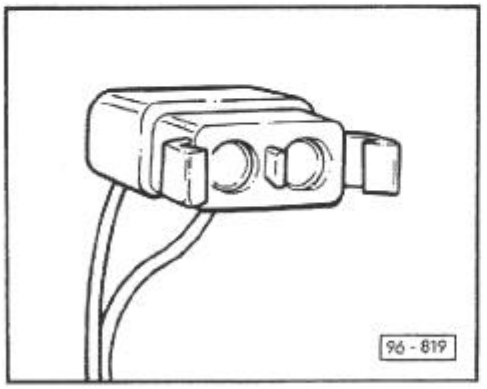
If reading is not correct, locate and eliminate break in wiring using current flow diagram.

If reading is correct, check lead as follows:



- Remove FEI control unit and pull plug off with ignition switched off.
(The control unit is behind the A pillar trim in front right footwell).

- Connect test box V.A.G 1598 to detached plug of FEI control unit -2- with adapter lead V.A.G 1598/7 -1-. The contact numbers of plug are identical to test box numbers.
Fuses OK - see current flow diagram.



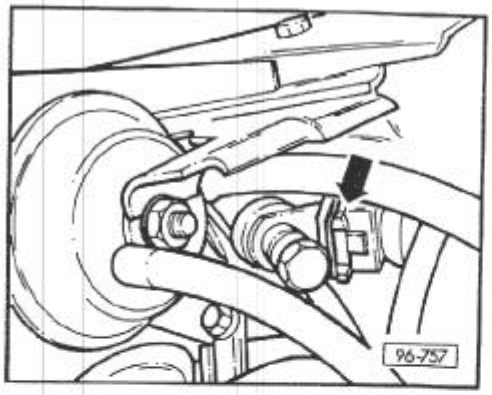
- Check continuity between test box contact 19 and plug lead (green/yellow) of solenoid valve for boost pressure control with multimeter.

Specified reading: approx. 1.0 Ω

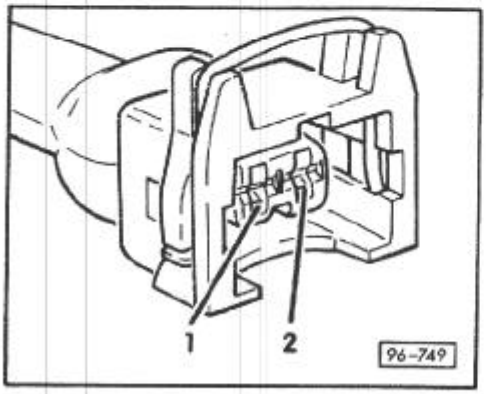
If reading is not correct, locate and eliminate break in wiring using current flow diagram.

If reading is correct, renew FEI control unit.

CHECKING ACTIVATION OF COLD START VALVE -N17



- Disconnect plug from cold start valve -N17.



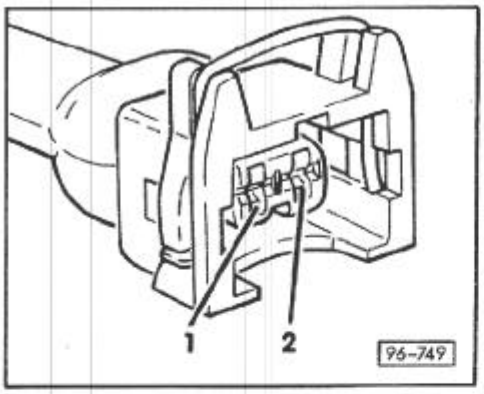
- Connect diode test lamp V.A.G 1527 to plug contacts 1 and 2 with leads from V.A.G 1594.

Note:

Cold start valve is only activated for approx. 10 seconds. This avoids over-enrichment of engine. Final control element diagnosis must be repeated for new check.

- Carry out final control element diagnosis up to activation of cold start valve (flash code 4443) - see self-diagnosis.

- LEd flashes, renew cold start valve.



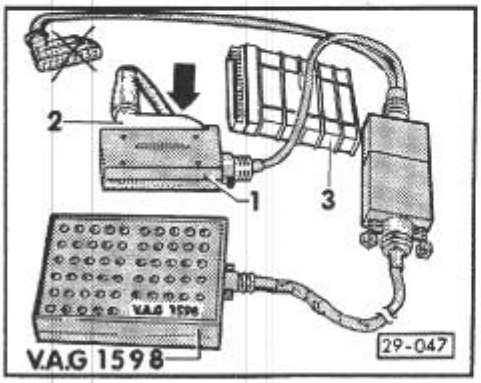
- LED does not light up, connect multimeter V.A.G 1526 for voltage measurement between plug contact 2 and earth with leads from V.A.G 1594.

Specified reading: approx. battery voltage

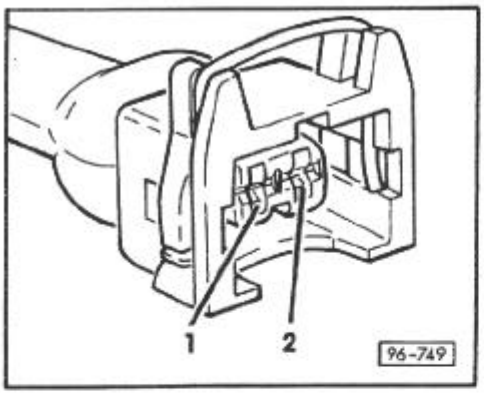
If reading is not correct, locate and eliminate break in wiring using current flow diagram.

If reading is correct, check lead as follows:

- Remove FEI control unit and pull plug off with ignition switched off.
(The control unit is behind the A pillar trim in front right footwell).



- Connect test box V.A.G 1598 to detached plug of FEI control unit -2- with adapter lead V.A.G 1598/7 -1-. The contact numbers of plug are identical to test box numbers.
Fuses OK - see current flow diagram.



- Check continuity between plug contact 1 of cold start valve and test box contact 1 with multimeter.

Specified reading: approx. 1.0 Ω

If reading is not correct, locate and eliminate break in wiring using current flow diagram.

If reading is correct, renew FEI control unit.