Turbocharger boost controls, checking

Boost pressure regulation, checking

- Connect VAG 1551 or VAG 1552 scan tool and press buttons -0- and -1- to insert "Engine Electronics" address word 01 (with engine running at idle) ⇒ Page 01-7 .

Rapid data transfer HELP
Select function XX

Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08, and press -Q- button to confirm input.

Read Measuring Value Block HELP
Input display group number XXX

Indicated on display

- Press buttons -1-, -1- and -4- to input display group number 114, and press -Q- button to confirm input.

Read Measuring Value Block 114 →
1 2 3 4

Indicated on display (1-4 = display fields)

- Road test car at wide open throttle at 4000 RPM.

WARNING!

A second technician is required to operate the VAG 1551 scan tool during the road test.

- Compare display with specified value for wastegate bypass regulator valve duty cycle in display field 4:

  Specified value: 5-95 %

If displayed value is OK:

- Change engine RPM until duty cycle is within specified value.

- Compare display with specified value for corrected specific engine load in display field 2:

  Specified value: 3.00-8.00 ms

- Compare display with specified value for actual engine load in display field 3:

  Specified value: must be same as corrected specified engine load in display field 2 (with tolerance of ± 0.50 ms)

24-125

	Display fields			
	1	2	3	4
Display group 114: Boost pressure regulation				
Display	xx.xx ms	xx.xx ms	xx.xx ms	xx %
Indicates	Specified engine load	Corrected specified engine load	Actual engine load	Duty cycle of wastegate bypass regulator valve
Range	---	---	---	0-99 %
Specified value	---	3.00-8.00 ms	Same as corrected specific engine load in display field 2 (tolerance ± 0.50 ms)	5-99 %

24-126

If the actual engine load is not within the tolerance, possible malfunctions are:

- Wastegate bypass regulator valve electrical malfunction
- Hoses for wastegate bypass regulator valve disconnected or blocked
- Wastegate bypass regulator valve -N75- blocked
- Air leaks between turbocharger and intake manifold
- Wastegate bypass regulator valve mechanical controls sticking (linkage, shaft)
- Turbocharger faulty (turbine blocked by foreign object)

Wastegate bypass regulator valve, checking

Function

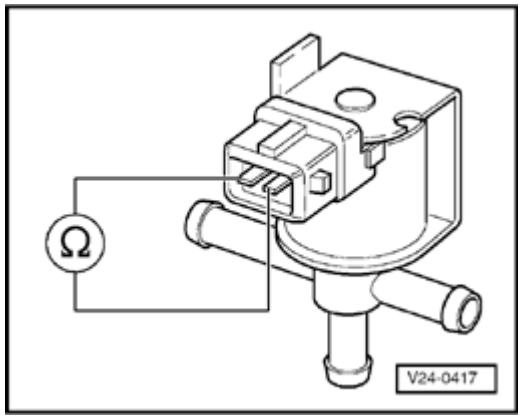
- With power off, the long connector is closed.
- Both short connecters are inter-connected.
- When triggered, the connection between the long and both short connectors is opened.

Check for leaks

- Remove wastegate bypass regulator valve (⇒ component location, page ⇒ Page 24-1)
- Re-connect removed wastegate bypass regulator valve to wiring harness.
- Start output Diagnostic Test Mode (DTM) and advance through test program to select wastegate bypass regulator valve -N75- ⇒ Page 01-42
- Blow into long connector during DTM to check whether valve opens properly.

If necessary:

- Replace wastegate bypass regulator valve -N75-.



Checking wastegate bypass regulator valve - N75-

- Disconnect harness connector from valve - N75-.

- Connect multimeter US 1119 (Fluke 83 or equivalent) to check resistance between terminals of valve -N75-.

  Specified value: 25-35 Ω

If resistance is not OK:

- Replace valve.

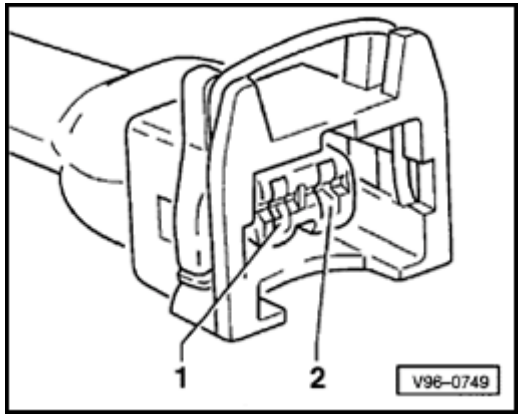
Check voltage supply for wastegate bypass regulator valve -N75-

Note:

Voltage supply for the wastegate bypass regulator valve is provided by the fuel pump relay.

- Fuse for -N75- OK

- Disconnect harness connector from valve.



- Connect VAG 1527B LED test light between harness connector terminal 1 and engine Ground.
- Operate starter motor.

  LED test light must light up

If LED does not light:

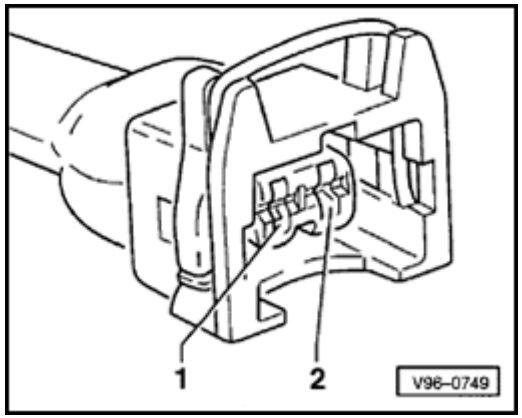
- Check wiring for open circuit between terminal 1 to and fuse, according to wiring diagram. Repair if necessary.

If wiring is OK:

- Check fuel pump relay ⇒ ⇒ Page 24-81 .

Signal for wastegate bypass regulator valve, checking

- Disconnect harness connector for valve -N75 .

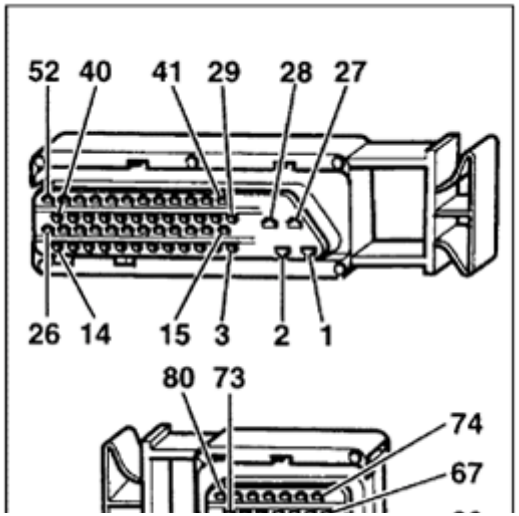


- Connect VAG 1527B LED voltage tester between connector terminals 1 (B+) and 2.
- Start output Diagnostic Test Mode (DTM) and advance through test program to select wastegate bypass regulator valve -N75- ⇒ Page 01-42

  LED test light must blink

If LED test light does not blink, or stays on continuously:

- Connect VAG 1598/22 test box to ECM harness connector ⇒ Page 01-56 .



- Check wiring for open circuit or short circuit to B+ between connector terminal 2 and ECM/test box socket 64. Repair if necessary.

If wiring is OK:

- Replace Motronic ECM -J220- ⇒ Page 01-57 .
- Carry out adaptation of throttle valve control module to ECM ⇒ Page 24-119 .
- Check readiness code ⇒ Page 01-59 . If Diagnostic Trouble Code (DTC) memory has been erased, or ECM was disconnected, generate new readiness code ⇒ Page 01-62 .

Barometric Pressure (BARO) sensor, checking

Note:

The signal from Barometric Pressure (BARO) sensor -F96- influences:

- *Boost pressure limit*
- *Mixture composition at engine start-up*

Required special tools and test equipment

- VAG 1551 or VAG 1552 Scan Tool (ST) with VAG 1551/3 adapter cable
- VAG 1598/22 test box
- Multimeter US 1119 (Fluke 83 or equivalent)
- VW 1594 connector test kit
- Wiring diagrams

Checking

- Connect VAG 1551 or VAG 1552 scan tool and press buttons -0- and -1- to insert "Engine Electronics" address word 01 (with engine running at idle) ⇒ Page 01-7 .

Rapid data transfer	**HELP**
Select function XX	

➢ Indicated on display

24-132

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08, and press -Q- button to confirm input.

Read Measuring Value Block HELP

Input display group number XXX

Indicated on display

- Press buttons -1-, -1- and -3- to input display group number 113, and press -Q- button to confirm input.

Read Measuring Value Block 113

1 2 3 4

Indicated on display (1-4 = display fields)

- Compare displayed value with specified air pressure value (display field 4):

	Display fields			
	1	2	3	4
Display group 113: Boost pressure regulation				
Display	xxx RPM	xx.xx ms	xxx °	xxxx mbar 1)
Indicates	Engine speed (in 40 RPM steps)	Engine load	Throttle valve angle	Air pressure
Range	0-6800 RPM	0.00-8.50 ms	0-90 °	559-1118 mbar
Specified value	0 RPM	0.00 ms	0-5 °	0 m ≈ 1013 mbar 400 m ≈ 970 mbar 1000 m ≈ 900 mbar

				2000 m ≈ 800 mbar 3000 m ≈ 700 mbar

1) Pressure fluctuations caused by weather conditions are not considered

- Check air pressure with turbocharger tester VAG 1597/A (actual pressure indication) and compare with displayed value.

If the displayed value is so high or low that it seems implausible for the altitude or the air pressure:

- Check wiring and terminals for excessive resistance ⇒ Page 24-134 .

If displayed value is NOT OK:

- Check readiness code ⇒ Page 01-59 . If Diagnostic Trouble Code (DTC) memory has been erased, or ECM was disconnected, generate new readiness code ⇒ Page 01-62 .

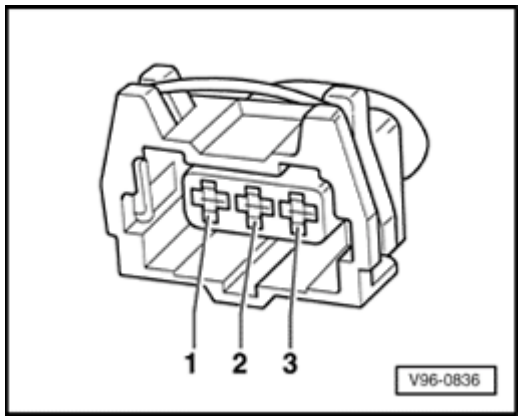
- Press → button to advance program sequence.

- Press buttons -0- and -6- to select "End Output" function 06, and press -Q- button to confirm input.

Checking wiring

- Disconnect harness connector from Barometric Pressure (BARO) sensor.

- Switch ignition on.

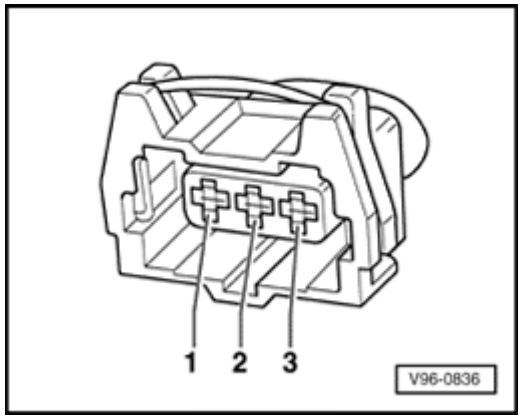


- Connect multimeter US 1119 (Fluke 83 or equivalent) and check voltage between connector terminals 1 and 3 (Ground) as well as 2 and 3 (Ground), using adapter cables from VW 1594 connector test kit.

  Specified value for both: 4.5-5.5 volts

If voltage is NOT OK:

- Switch ignition off.
- Connect VAG 1598/22 test box to ECM harness connector ⇒ Page 01-56 .



- Check wiring for open circuit between ECM/test box and 3-pin harness connector, according to wiring diagram.
  - Connector terminal 1 to ECM/test box socket 61
  - Connector terminal 2 to ECM/test box socket 62
  - Connector terminal 3 to ECM/test box socket 67
  - Specified value: max. 1.5 Ω

- Check wiring for short circuits between terminals of 3-pin connector, and between connector and ECM/test box.

  - Connector terminal 2 to ECM/test box socket 61
  - Connector terminal 3 to ECM/test box socket 61
  - Connector terminal 3 to ECM/test box socket 62
  - Specified value: $\infty\ \Omega$

If wiring is OK:

- Replace Barometric Pressure (BARO) sensor.

If an implausible value is still displayed after replacing the barometric pressure sensor:

- Replace Motronic ECM -J220- ⇒ Page 01-57 .
- Carry out adaptation of throttle valve control module to ECM ⇒ Page 24-119 .
- Check readiness code ⇒ Page 01-59 . If

Diagnostic Trouble Code (DTC) memory has been erased, or ECM was disconnected, generate new readiness code ⇒ Page 01-62 .