Additional signals

Signal from A/C compressor, checking

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

Test conditions

- A/C functions OK
- A/C is switched off
- Vehicle at room temperature-above 15 ° C (59 ° F)

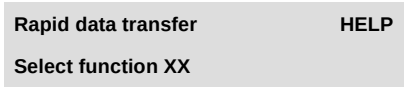
No malfunctions stored in Diagnostic Trouble

- Code (DTC) memory ⇒ Page 01-15 .

24-146

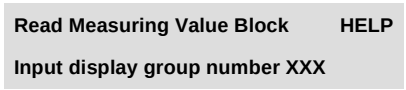
Checking

- 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 .



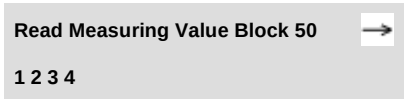
➢ Indicated on display

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



➢ Indicated on display

- Press buttons -0-, -5- and -0- to input display group number 50, and press -Q- button to confirm input.



➢ Indicated on display (1-4 = display fields)

- Switch on A/C (lowest temperature and highest fan position).

24-147

- Compare display with specified value in display field 4.

	Display fields			
	1	2	3	**4**
Display group 50: Signals to Engine Control Module (ECM)				
Display	xxxx RPM	xxxx RPM	A/C-LOW	**Compr. ON** **Compr. OFF**
Indicates	Actual engine speed (in 10 RPM steps)	Specified engine speed (in 10 RPM steps)	A/C status	**A/C compressor status**
Range	0-2550 RPM		---	**---**
Specified value	820-900 RPM	860 RPM	A/C-LOW	**Compressor on: Compr. On** **Compressor off: Compr. OFF**
	---	---	---	**If not as specified ⇒ Page 24-148 , Continuation**

Notes:

- *The A/C compressor is switched off during acceleration when the car is stationary or at slow speed.*

- *At wide open throttle the A/C compressor is switched off by the Transmission Control Module (TCM) (kick down switch).*

24-148

Continuation

If the displayed values are NOT OK:

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

- Check wiring for open circuit, short circuit to B+ or short circuit to Ground between ECM/test box terminal 8 and A/C control head -E87-, or Transmission Control Module (TCM).

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

If the wiring is OK:

- Check function of A/C control head -E87-.

⇒ *Repair Manual, Heating & Air Conditioning, Repair Group 01*

Or:

⇒ *Repair Manual, 5 Spd. Automatic*

Transmission 01V, Repair Group 01

- 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 .

24-149

Vehicle speed signal, checking

Required special tools and test equipment

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

Test conditions

- Vehicle Speed Sensor (VSS) OK; checking:

⇒ *Repair Manual, Electrical Equipment, Repair Group 90*

Notes:

- *To check Vehicle Speed Sensor -G68-, the vehicle must be driven. A second technician is required to operate the scan tool during the road test.*

- *The speed signal is generated by the vehicle speed sensor (at the transmission), and processed at the speedometer/odometer in the instrument cluster.*

24-150

Test procedure

- 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 -0-, -0- and -5- to input display group number 5, and press -Q- button to confirm input.

Read Measuring Value Block 5 → **1 2 3 4**	Indicated on display (1-4 = display fields)

24-151

- Road test and compare indicated vehicle speed with value in display field 3 (2nd technician required).

	Display fields			
	1	2	3	4
Display group 5: Engine Electronics				
Display	xxx RPM	xx.xx ms	xxx kph	Idle Part throt Full throt Decel Enrich
Indicates	Engine speed (in 40 RPM steps)	Engine load	Vehicle speed	Operating condition
Range	0-6800 RPM	---	---	---
Specified value	---	---	Approx. vehicle speed	---
	---	---	If no vehicle speed is displayed ⇒ Page 24-152 , Continuation	---

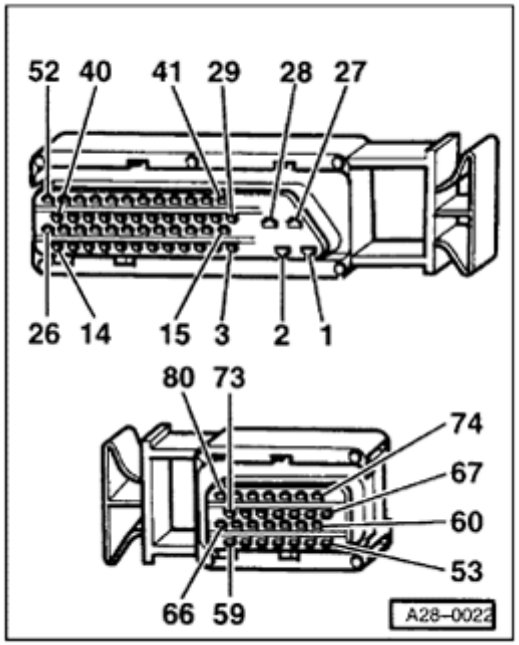
If displayed value is OK:

- Press → button toadvance program sequence.

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

- Switch off ignition.

24-152



Continuation

If no speed was indicated:

- Connect VAG 1598/22 test box to ECM harness connector ⇒ Page 01-56 .
- Connect VAG 1527B LED voltage tester between ECM/test box sockets 3 (B+) and 20 (signal).
- Lift vehicle at left front until wheel is free.
- Switch ignition on and rotate left-front wheel by hand.

  LED must blink (very brief blink)

Notes:

- *The right-front wheel must not rotate; block it if necessary.*
- *For LEDs with little voltage consumption, the LED lights up at half strength when the ignition is switched on.*

If the LED does not blink:

- Check wiring from ECM connector, terminal 20 to instrument cluster for open circuit or short circuit

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

If the wiring is OK and the LED does not blink:

⇒ *Repair Manual, Electrical Equipment, Repair Group 90*

- Check readiness code ⇒ Page 01-59 . If DTC memory was erased, or ECM disconnected, generate new readiness code ⇒ Page 01-62

24-153

Transmission Range (TR) signal, checking

Notes:

- *Through the multi-function Transmission Range (TR) program switch -F125- at the transmission, the Engine Control Module (ECM) recognizes whether a drive range is selected (selector lever in 2/3/4/R/D) or not (selector lever in P or N)*
- *The multi-function Transmission Range (TR) program switch -F125- at the transmission switches to Ground through terminal 22 of the ECM when the shift lever is in N or P.*
- *When a drive range is selected, the switch opens and terminal 22 now has power.*

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

Test procedure

- 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.

24-154

Read Measuring Value Block HELP

Input display group number XXX

Indicated on display

- Press buttons -0-, -5- and -6- to input display group number 56, and press -Q- button to confirm input.

Read Measuring Value Block 56

1 2 3 4

Indicated on display (1-4 = display fields)

- Compare display with specified value in display field 4:

	Display fields			
	1	2	3	**4**
Display group 56: Engine idle				
Display	xxxx RPM	xxxx RPM	x.xx g/s	**xxxx**
Indicates	Actual engine speed (in 10 RPM steps)	Specified engine speed (in 10 RPM steps)	Control value-Idle mass air flow (idle air control valve)	**Operating condition**
Range	0-2550 RPM	---	---	**---**
Specified value	0 RPM	0 RPM	-1.11 to 1.11 g/s	**0000 = Selector lever in P or N** **0010 = Selector lever in 2/3/4/R/D**
	---	---	---	**If not as specified ⇒ Page 24-155 , Continuation;** **Explanation of display ⇒ Page 24-16**

24-155

If displayed value is OK (as specified):

- Press →button toadvance program sequence.

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

- 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 .

Continuation:

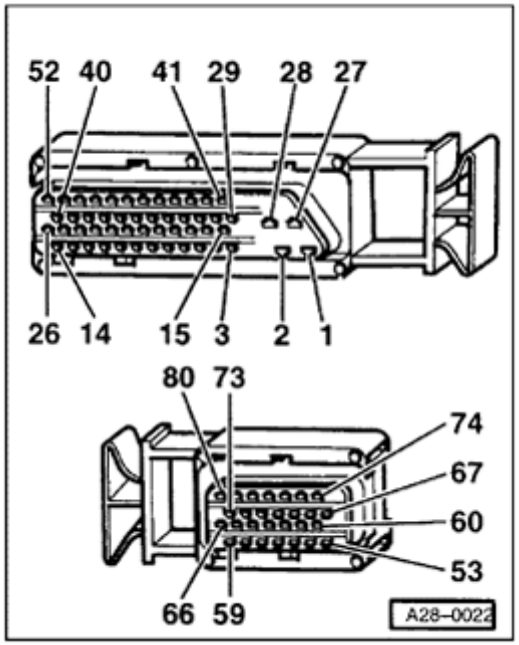
If displayed value is NOT OK (not as specified):

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

- Connect VAG 1527B LED voltage tester between ECM/test box sockets 3 (battery voltage, terminal 30) and 22.

  - LED must come on with selector lever in P or N

  - LED must then go out when selecting 2/3/4/R/D



If the LED lights up continuously or does not light up at all:

- Check wiring for open circuit, short circuit to Ground or short circuit to B+ between ECM/test box socket 22 and multi-function Transmission Range (TR) program switch -F125-.

24-156

If the wiring is OK:

- Check multi-function Transmission Range (TR) program switch -F125-.

⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 01*

- 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 .

Explanation of 4-digit display

Explanation when display field is = 0				
x	x	x	x	(Display group 56)
			0	A/C compressor off (0 = A/C compressor off / 1 = A/C compressor on)
		0		Selector lever in P or N (0 = selector lever in P or N /1 = selector lever in 2/3/4/R/D)
	0			Always "0"
0				Always "0"

24-157

Timing control during shifting, checking

Notes:

- *When shifting the automatic transmission, this signal from the Transmission Control Module (TCM) retards the ignition timing briefly, depending on vehicle speed and engine RPM (reduction of torque), to reduce shift pressure.*

- *Because of the very brief signal to reduce torque, the signal is not always recognized by the VAG 1551 scan tool, and therefore is not always indicated.*

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

24-158

Test procedure

- 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, 2 and 2- to input display group number 122, and press -Q- button to confirm input.

Read Measuring Value Block 122 →
1 2 3 4

Indicated on display (1-4 = display fields)

- Road test.

WARNING!

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

24-159

- Compare display with specified value in display field 4:

	Display fields			
	1	2	3	4
Display group 122: Engine torque reduction during shifting				
Display	xxxx RPM	xxx Nm	xxx Nm	TCS active Motor enga
Indicates	Engine speed (in 40 RPM steps)	Required engine torque (Specified torque)	Actual engine torque (Actual torque)	Timing angle retard active or not active
Range	0-6800 RPM	-100 to 410 Nm	-100 to 310 Nm	---
Specified value	---	---	---	When shifting, "Motor enga" must be displayed briefly
	---	---	---	If not as specified ⇒ Page 24-160

If display is OK (as specified):

- Press →button to advance program sequence.

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

- Switch ignition off.

24-160

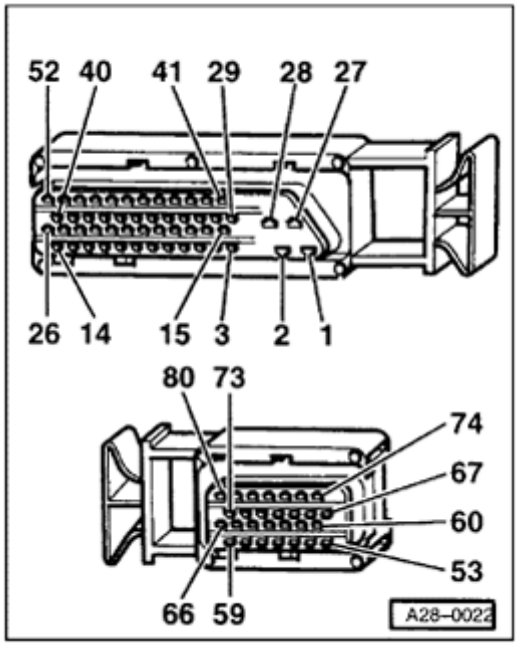
Continuation

Note:

The wiring to the Transmission Control Module is monitored by On Board Diagnostic and stores the Diagnostic Trouble Code 00545 if there is a malfunction.

If displayed value is NOT OK (not as specified), or if DTC 00545 is stored in DTC memory:

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



- Check wiring for short circuit or open circuit between ECM harness connector terminal 23 and to Transmission Control Module (TCM), according to wiring diagram

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

24-161

Rough road signal from ABS/EDL control module, checking

Notes:

- *When the ABS/EDL control module senses a wheel spinning, it produces the rough road signal. When the ECM recognizes the rough road signal, the misfire recognition is switched off.*
- *Check the rough road signal only when the trouble code 18014 "Rough Road Spec Engine Torque ABS-ECU Electrical Malfunction" is stored. The "Misfire" malfunction is in this case a subsequent malfunction that can be disregarded.*
- *The wiring and the rough road signal are monitored by the ECM.*
- *Emissions testing on a front-wheel drive vehicle with ABS/EDL, during which only the front wheels turn while the rear wheels are stationary, can result in the DTC 18014 being stored in DTC memory. Therefore, the fuse for the ABS/EDL control module must be removed. After the test, check DTC memory for the ABS/EDL control module and the ECM. Then erase DTC memory.*

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

24-162

Test requirements

- ECM coding OK ⇒ Page 01-13

Test sequence

- Switch ignition off.
- Connect VAG 1598/22 test box to ECM harness connector ⇒ Page 01-56 .
- Check signal wiring for short circuit or open circuit between ECM/test box and ABS control module, according to wiring diagram.

If the wiring is OK:

- Replace ABS control module.

If the malfunction occurs again after the ABS control module has been replaced:

- 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 .