

Audi 100 1991 ➤

Automatic gearbox 01F and 01K, self-diagnosis									
Gearbox ID	CBE	CBF	CDE	CDS	CDT	CDU	CEZ	CJD	CJE
	CNT	CRC	CRD	CRE	CRF	CRG	CRH	CYR	CYS
	DAA	DCF							

Edition 11.1996

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List of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups Audi 100 1991 ➤

Automatic gearbox 01F and 01K, self-diagnosis

Repair Group

01 - Self-diagnosis



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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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01 - Self-diagnosis

1 - Function of self-diagnosis

1.1 - Function of self-diagnosis

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The automatic gearbox is controlled electro-hydraulically.

The control unit for the automatic gearbox -J217 is supplied with information from components which influence gear selection. On the basis of this information, it generates signals to control the relevant solenoid valves in the valve body. The solenoid valves divert the oil pressure generated by the ATF pump to the respective clutches or brakes.

Fault recognition of gear control unit

The term "self-diagnosis" relates to the electrical and electronic components of the control system.

The automatic gearbox control unit -J217 is equipped with a fault memory to enable quick determination of the fault cause in the event of an electric / electronic component failure or of an open circuit. Faults are recognised by electric signals and are stored in the fault memory.

The automatic gearbox control unit -J217 recognises and stores certain types of fault under various conditions. Fault table =>Page **25**.

If faults occur in the monitored sensors or components, they are stored in the memory together with an indication of the location and nature of the fault.

If a fault occurs it is first stored as a static fault. If this fault does not occur again it is classified as a sporadic fault (or "SP").

Faults which are stored as sporadic faults in the fault memory are displayed as such when the fault memory is interrogated with V.A.G1551. "/SP" appears on the right of the display. If the printer is switched on it will print out "sporadic fault" after the fault is identified.

Faults which are stored as sporadic faults in the fault memory, are automatically erased after 40 gearbox cold starts (and subsequent gearbox warm up).

The self-diagnosis possibilities can only be used with the fault reader V.A.G 1551 and the vehicle system tester V.A.G 1552, operation mode 1 "Rapid data transfer".

Functions which can be read with the fault reader => Overview of selectable functions, Page **23**.

Safety functions of gearbox control unit

In the event of failure of one or more components or sensors, the automatic gearbox control unit -J217 activates the appropriate emergency or back-up running mode. In this way, the system ensures damage-free operation of the automatic gearbox, although gear-shifting may be impaired when the gearbox is operating in back-up mode.

- ♦ When certain faults occur (=> Table, Page **2**) and with active gearbox control unit, the momentary selected gear is retained. The gearbox control unit shifts in steps from any forward gear into 2nd gear as soon as the driving situation with regard to the gearbox and driving safety permits.
- ♦ After the engine is started again, the gearbox control unit will return to its normal running mode until a fault occurs.

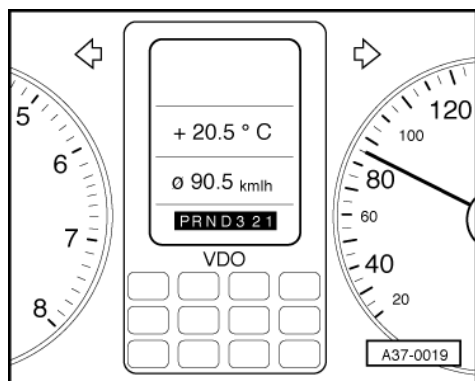
**Faults that lead to a shift into second gear:**

Fault code	
00518	Throttle valve potentiometer -G69
00545	Engine/gearbox electrical connection
00638	Engine/gearbox electrical connection 2
00652	Gear monitoring

- ♦ When critical faults occur (=> Table, Page 2) emergency run is initiated. 4th gear is engaged if this occurs during driving operation. 4th gear remains engaged until the vehicle comes to a standstill.
- ♦ It is possible to drive in 2nd gear with the selector lever in positions D, 3, 2 and 1 after a re-start.

Emergency running mode with activated control unit

- ♦ All solenoid valves are inactive.
- ♦ Reverse gear lock is not active, i.e. it would be possible to shift directly into reverse while driving forwards, which would damage the gearbox.
- ♦ When driving, the gearbox shifts from all forward gears into 4th.



- ♦ 2nd gear is engaged in selector lever position "D" after the re-start.
- ♦ Maximum switching pressure on force transferring elements.
- ♦ Reverse gear may be selected. Selector lever lock (in "P" and "N") is active.
- ♦ -> All segments of the gear display are completely illuminated.

Emergency run with non-active control unit

If a failure should occur in the automatic gearbox control unit -J217 (e.g. power failure or a loose electrical connector), the gearbox is immediately operated in "Emergency running mode with non-active control unit".

- ♦ All solenoid valves are inactive.
- ♦ Reverse gear lock is not active, i.e. it would be possible to shift directly into reverse while driving forwards, which would damage the gearbox.
- ♦ When driving, the gearbox shifts from all forward gears into 4th.
- ♦ 2nd gear is engaged in selector lever position "D" after the re-start.
- ♦ Maximum switching pressure on force transferring elements.
- ♦ Reverse gear may be selected. Selector lever lock (in "P" and "N") is non-active.
- ♦ All segments of the gear display are dark.
- ♦ The gearbox control unit is not functioning at all, i.e. it is impossible to call up self-diagnosis.

Faults leading to emergency running:

Fault code	
00258	Solenoid valve 1 -N88
00260	Solenoid valve 2 -N89
00262	Solenoid valve 3 -N90
00264	Solenoid valve 4 -N91
00293	Multi-function switch -F125

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Fault code	
00529	Speed information missing (engine speed)
00532	Supply voltage
00543	Maximum revs exceeded
00597	Differing wheel speed impulses 1)
01044	Control unit incorrectly encoded
65535	Control unit faulty

- 1) Emergency run is only initiated in selector lever positions "P" and "N".

1.2 - Technical self-diagnosis data

Fault memory	
- Non-volatile memory	yes
Data output	
- Rapid data transfer	yes
- Flash code output	no
Final control diagnosis	yes
Basic setting	no
Coding control unit	yes ¹
Reading measured value block	yes
Electric/electronic components and installation locations	=> Page 4

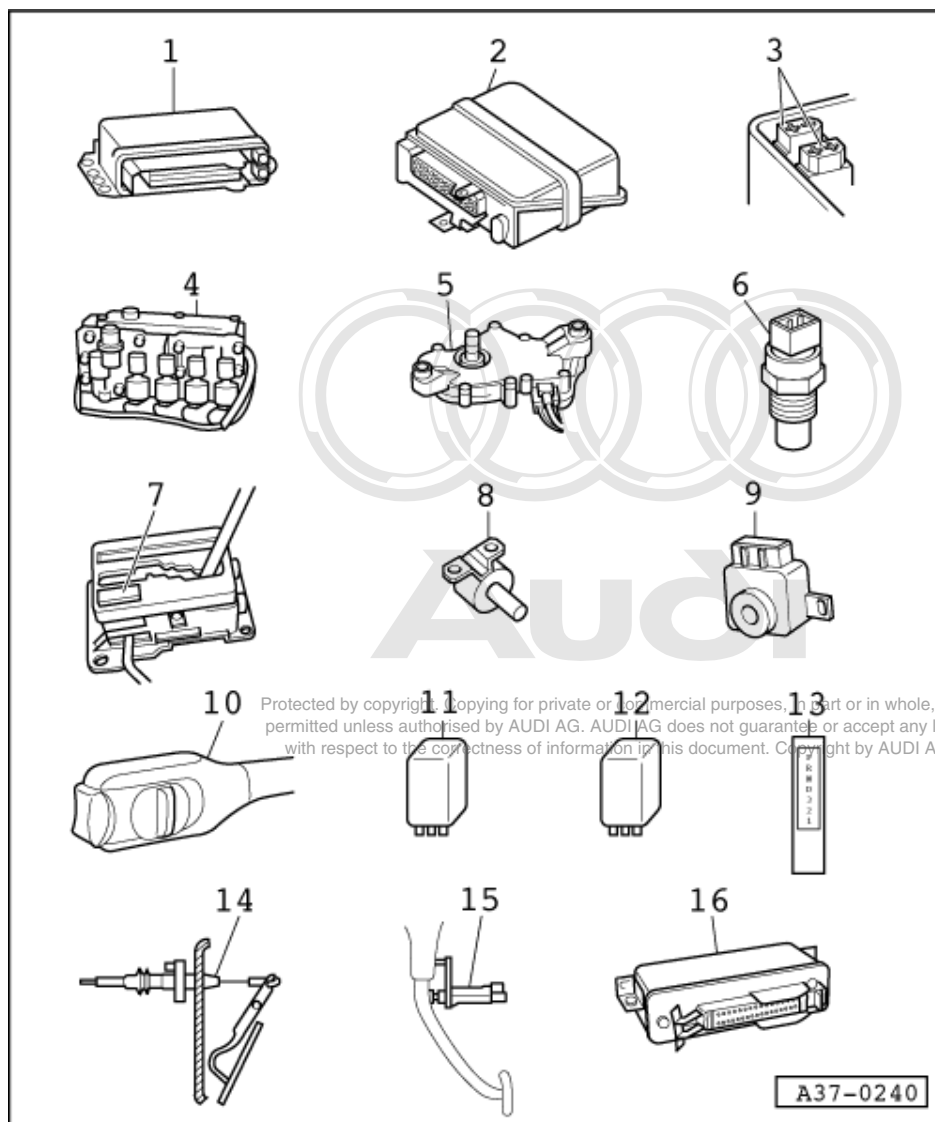
- 1) Only control unit, 88-pin (MY 96 ä; gradual introduction).

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2 - Electric/electronic components and installation locations

2.1 - Electric/electronic components and installation locations



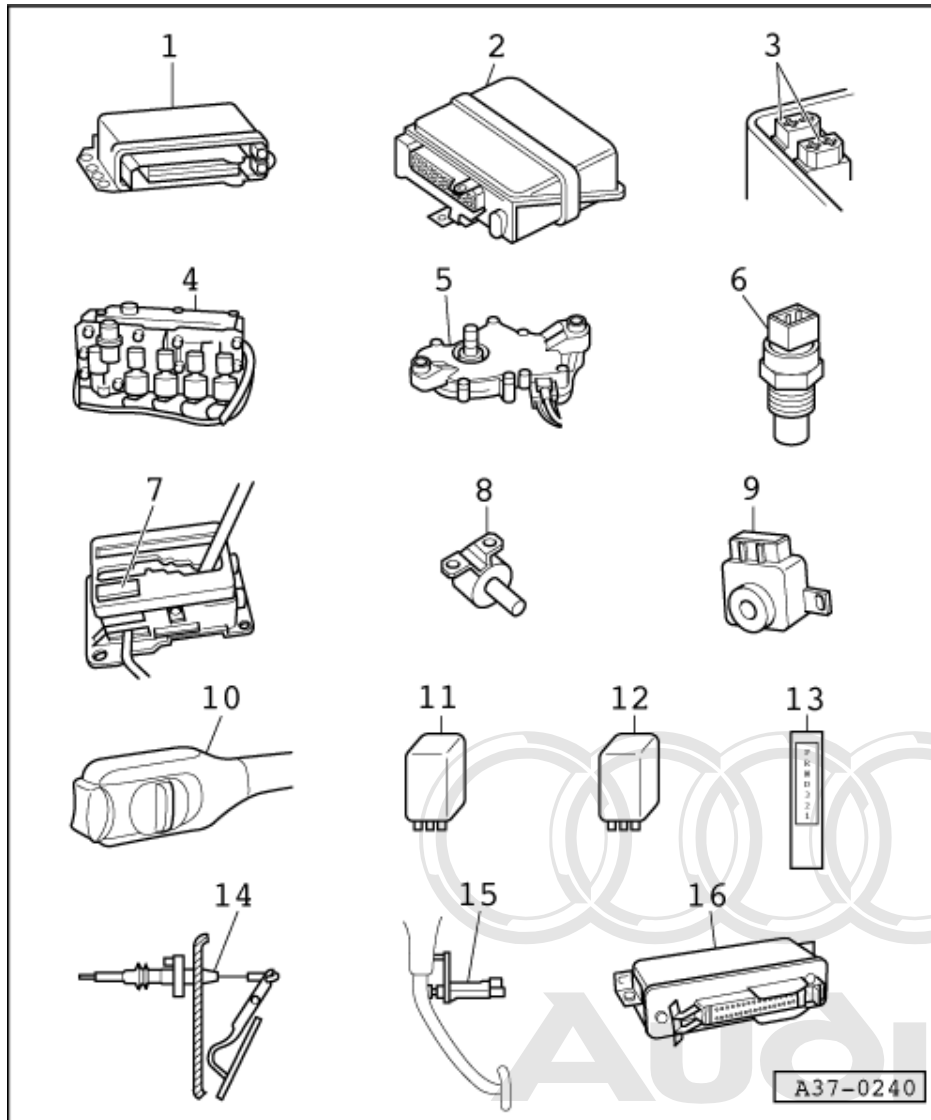
Note:

Vehicle allocation and fitting locations

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

1 Automatic gearbox control unit -J217

- ◆ Location: In electronics box in passenger's side footwell
- ◆ ä approx. 08.95: Control unit, 55-pin with integral relay for solenoid valves and for CCS
- ◆ MY 96 ä (gradual introduction): Control unit, 88-pin. Relay for solenoid valves and CCS replaced by transistors



- ◆ Checking by self-diagnosis => as of Page 21
- ◆ Removing and installing => Page 17
- ◆ Disconnect connector => Page 19

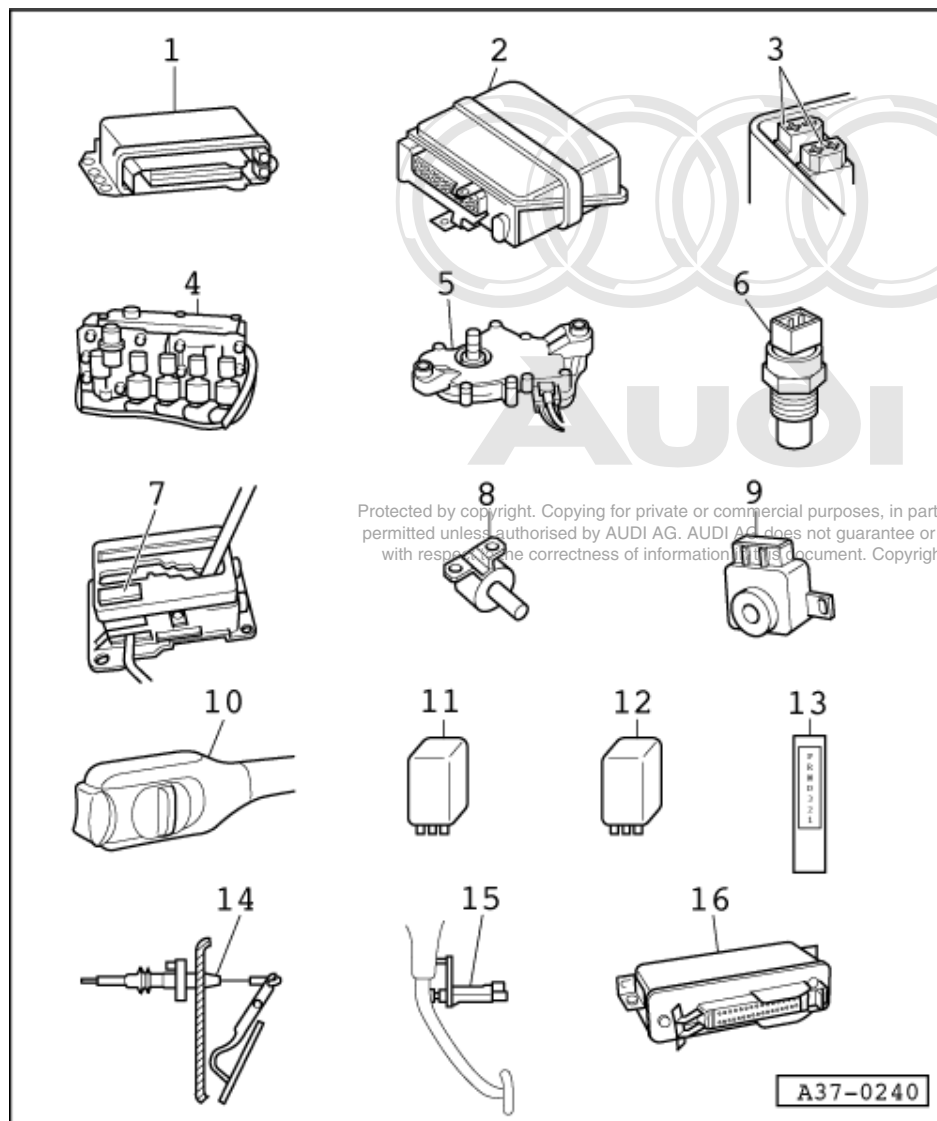
2 Engine control unit

- ◆ Location: In electronics box in passenger's side footwell
- ◆ Removing and installing

=> Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Removing and installing control unit Self-diagnosis for diesel direct injection system Removing and installing control unit

=> Motronic Fuel Injection and Ignition System (5-cyl.); Repair Group 01; Motronic self-diagnosis; Removing and installing Motronic control unit Motronic self-diagnosis Removing and installing Motronic control unit

=> Motronic Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Motronic self-diagnosis; Removing and installing engine control unit Motronic self-diagnosis Removing and installing engine control unit



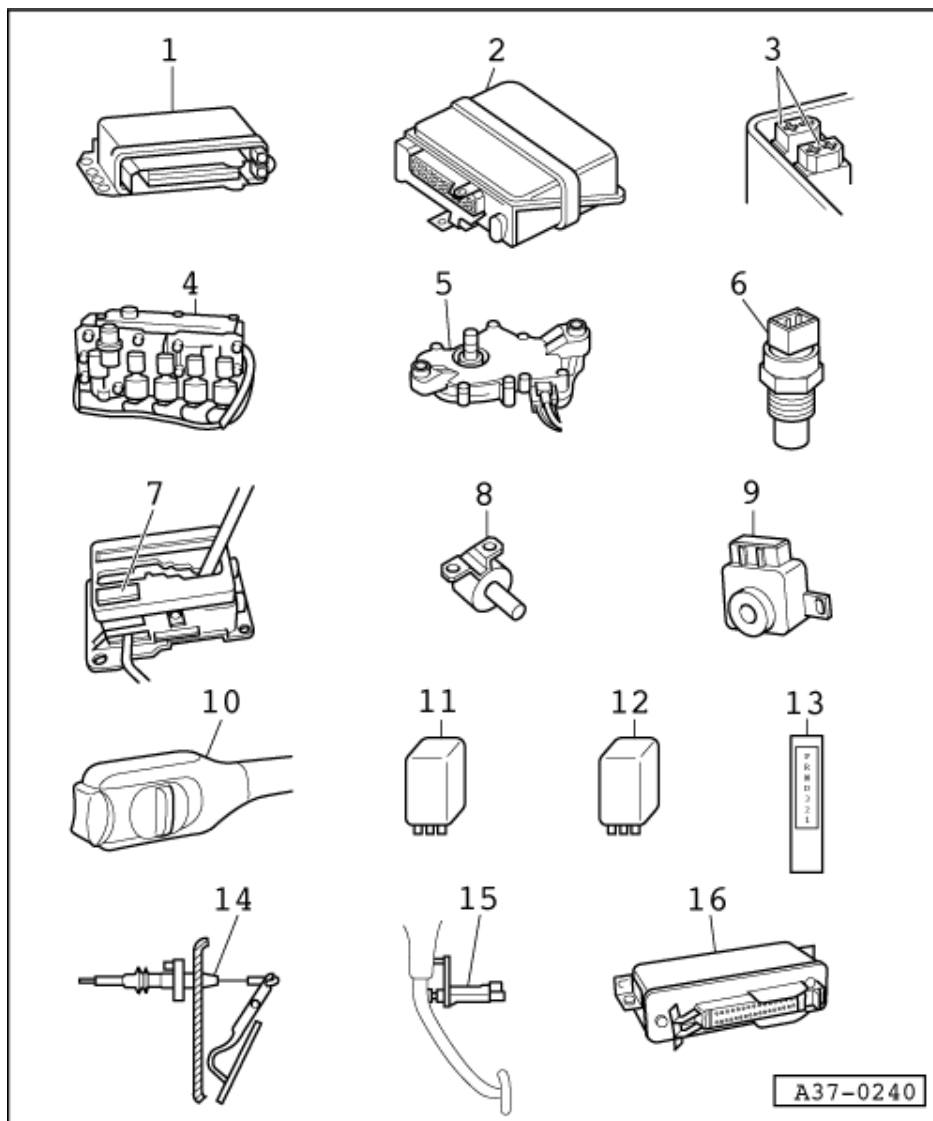
=> MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Replacing, removing and installing MPFI control unit Self-diagnosis for Multi-Point-Fuel-Injection (MPFI) Replacing, removing and installing MPFI control unit

=> MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Replacing, removing and installing control unit Self-diagnosis for Multi-Point-Injection (MPI) Replacing, removing and installing control unit

=> MPI fuel injection and ignition system (6- Cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Replacing, removing and installing MPI control unit Self-diagnosis for Multi-Point-Injection (MPI) Replacing, removing and installing MPI control unit

3 Diagnostic socket

- ◆ Location: In auxiliary relay carrier I in the plenum chamber
- ◆ Connecting fault reader V.A.G 1551 and selecting functions => Page 21



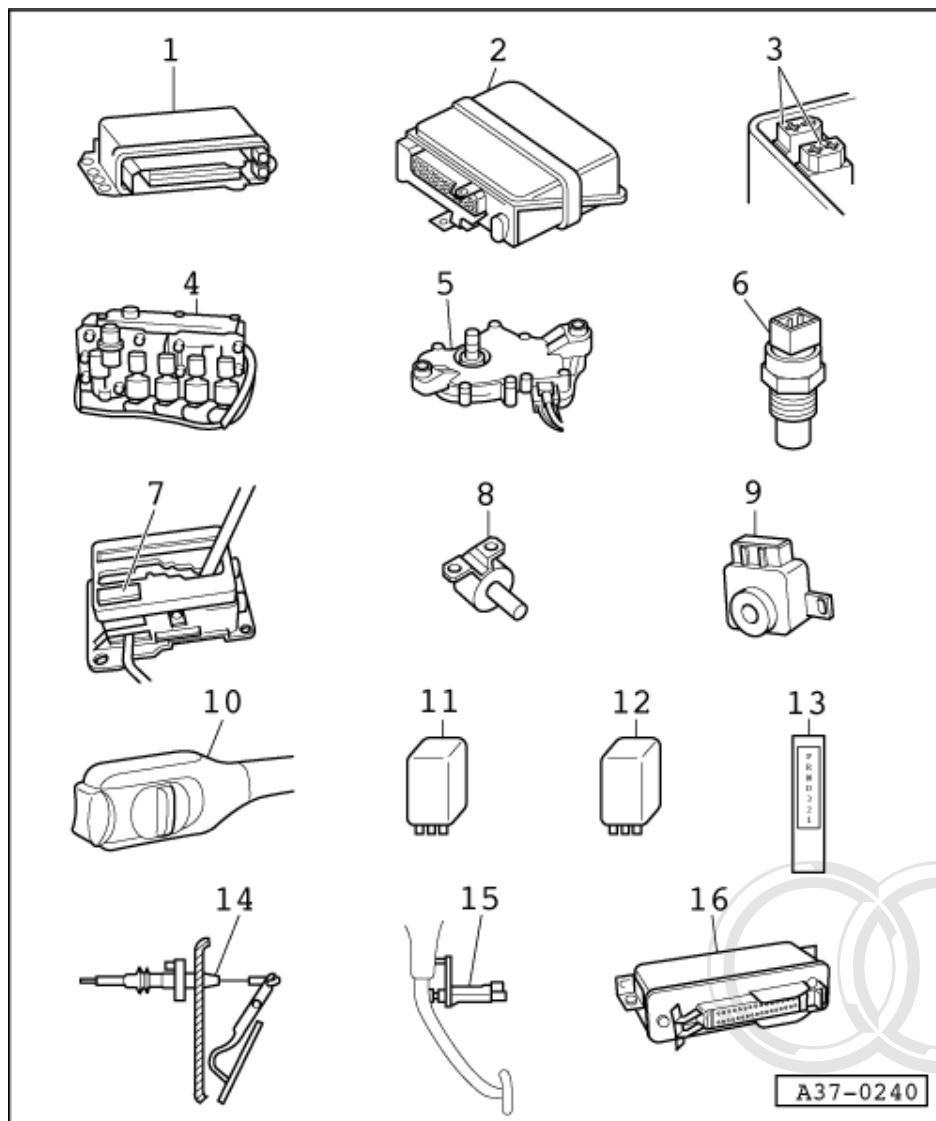
4 Valve body

- ◆ Location: under gearbox oil pan
- ◆ Solenoid valves -N88, -N89, -N90, -N91 secured to valve body
- ◆ Gear oil temperature sender (ATF) -G93 incorporated in wiring harness inside gearbox.
- ◆ Components are checked electrically via self-diagnosis.
- ◆ Removing and installing

=> Automatic gearbox 01F four-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

=> Automatic gearbox 01K front-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body



**5 Multi-function switch -F125**

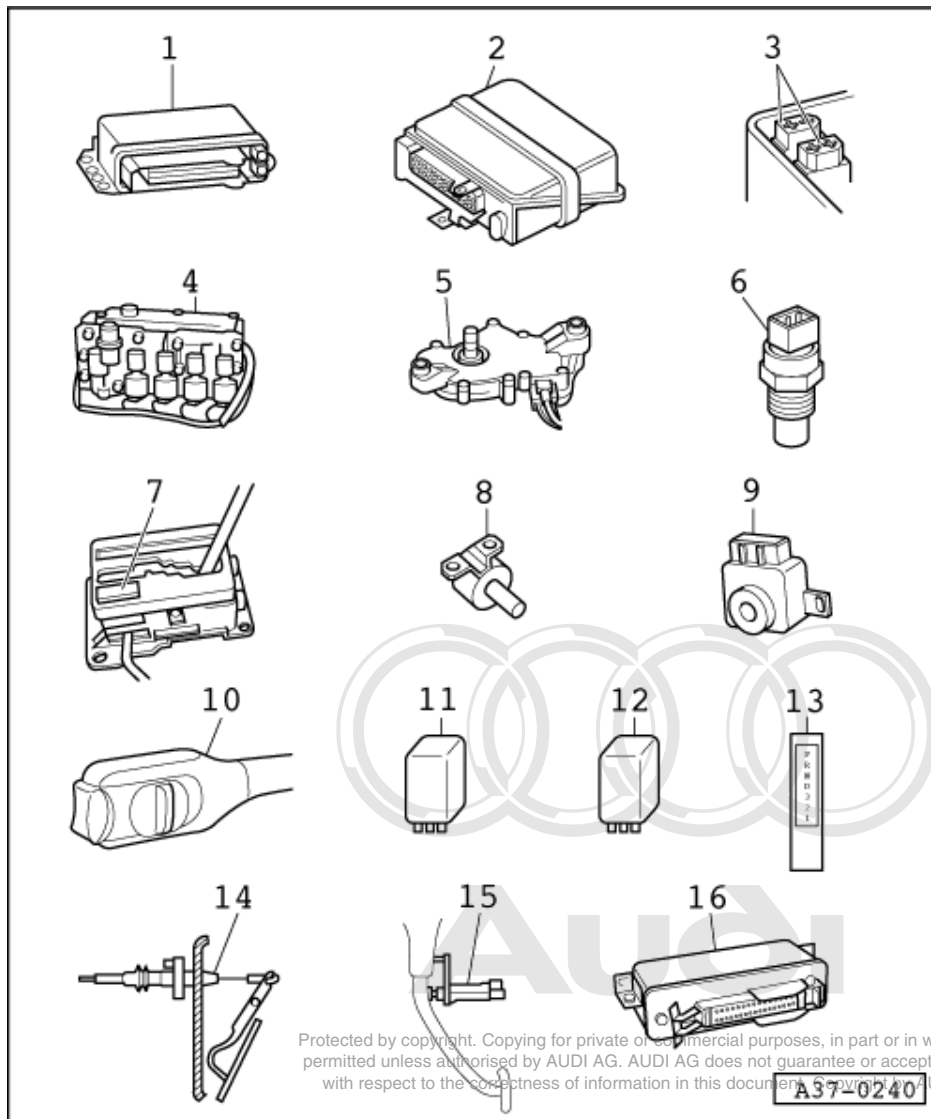
- ◆ Location: on gearbox, left side
- ◆ Checking by self-diagnosis => as of Page 21
- ◆ Removing and installing

=> Automatic gearbox 01F, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125. Dismantling and assembling gearbox Removing and installing multi-function switch -F125.

=> Automatic gearbox 01K front-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125 Dismantling and assembling gearbox Removing and installing multi-function switch -F125

6 Gearbox speed sender -G38

- ◆ Installed only on automatic gearbox 01K
- ◆ Location: at top of gearbox

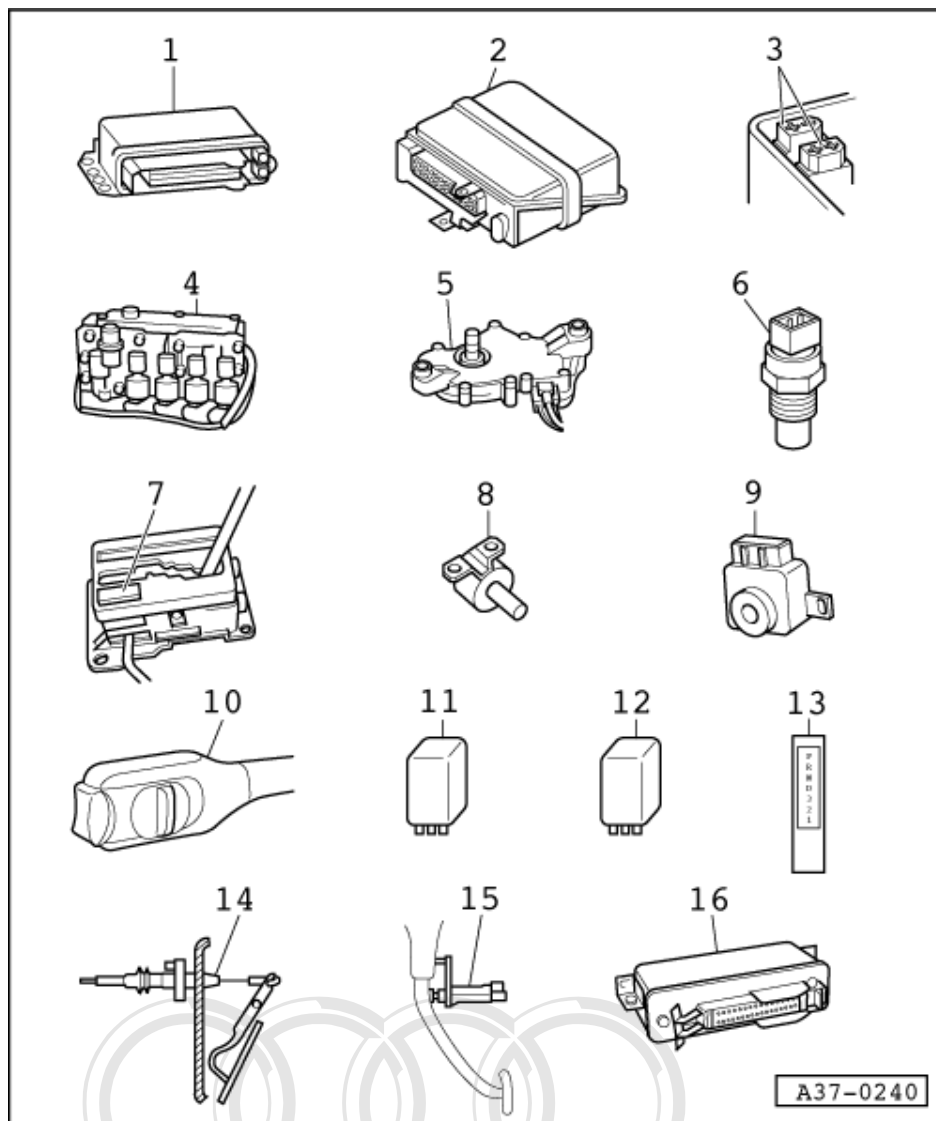


- ◆ Tested by self-diagnosis
- ◆ Functioning is impaired by dirt; clean if necessary
- ◆ Removing and installing

=> Automatic gearbox 01K front-wheel drive; Repair group 38; Removing and installing gearbox speed sender -G38 Removing and installing gearbox speed sender -G38

7 Programme switch -E122

- ◆ Only for 2.8 l - 128 kW with gearbox 01F ä approx. 09.92
- ◆ Discontinued with introduction of "Dynamic switching programme"
- ◆ Checking by reading measured value block => as of Page 49

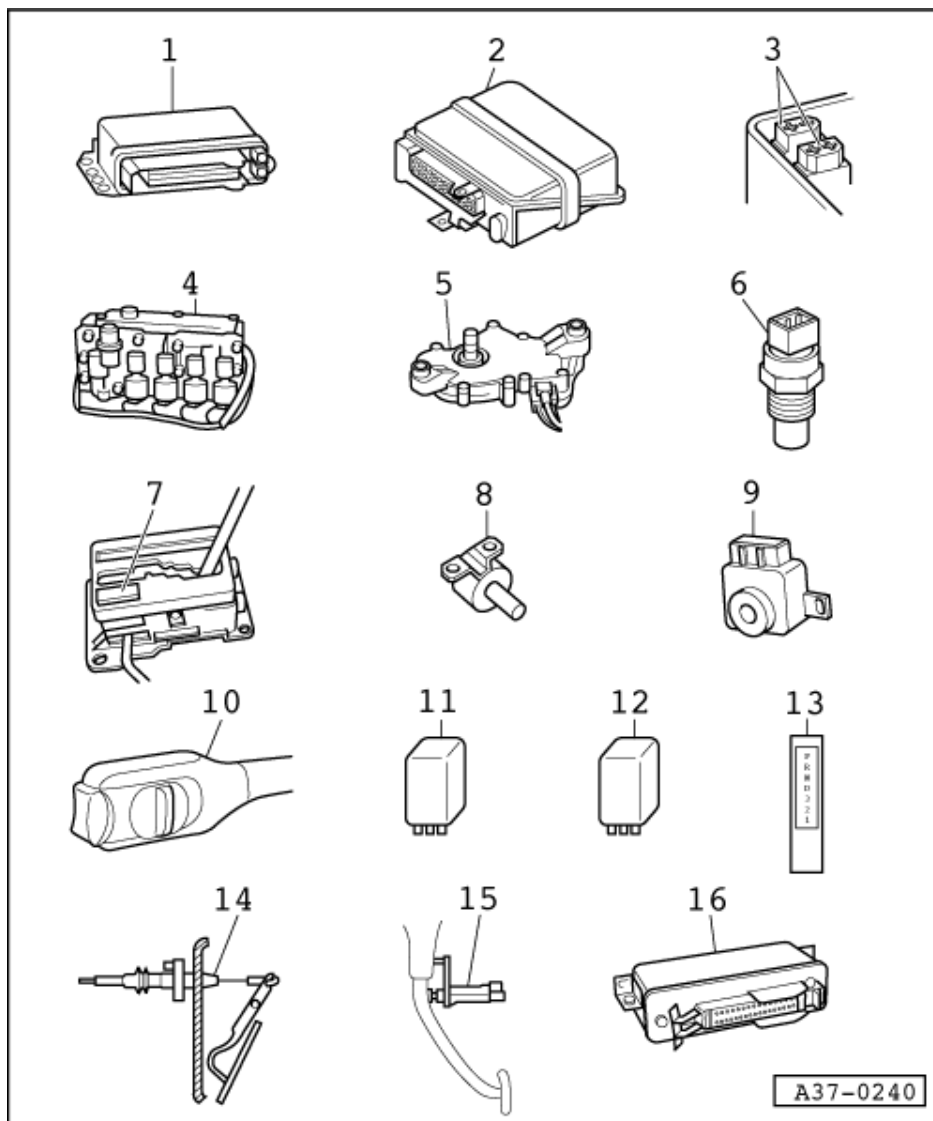
**8 Selector lever lock solenoid -N110**

- ◆ Location: At front of shift mechanism
- ◆ Checking in reading measured value block => as of Page 77
- ◆ Removing and installing

=> Automatic gearbox 01F four-wheel drive.; Repair Group 37; Servicing shift mechanism; Dismantling and assembling shift mechanism Servicing shift mechanism Dismantling and assembling shift mechanism

=> Automatic gearbox 01K front-wheel drive.; Repair Group 37; Servicing shift mechanism; Dismantling and assembling shift mechanism Servicing shift mechanism Dismantling and assembling shift mechanism

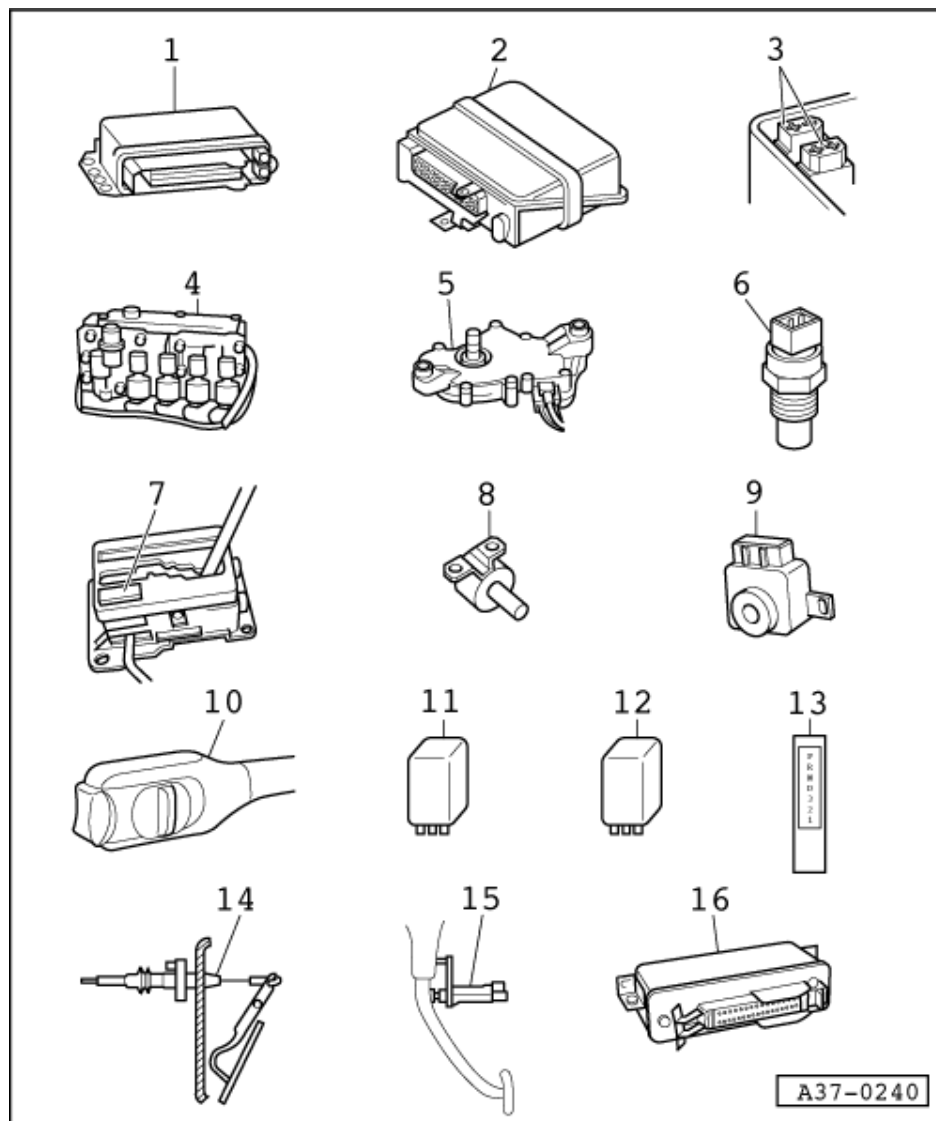
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9 Throttle valve potentiometer -G69

- ◆ Installation location 2.2 l - 169 kW, 2.6 l - 110 kW, 2.8 l - 128 kW: at throttle valve connection
- ◆ Installation location 2.8 ltr. - 142 kW integrated in throttle flap control unit -J338
- ◆ Signal checked via self-diagnosis
- ◆ Signal is sent from throttle flap potentiometer via the engine control unit to the gearbox control unit. If the throttle flap potentiometer is shown as a fault during self-diagnosis, the self-diagnosis for the engine control unit must also be carried out.

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=> Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system Interrogating and erasing fault memory

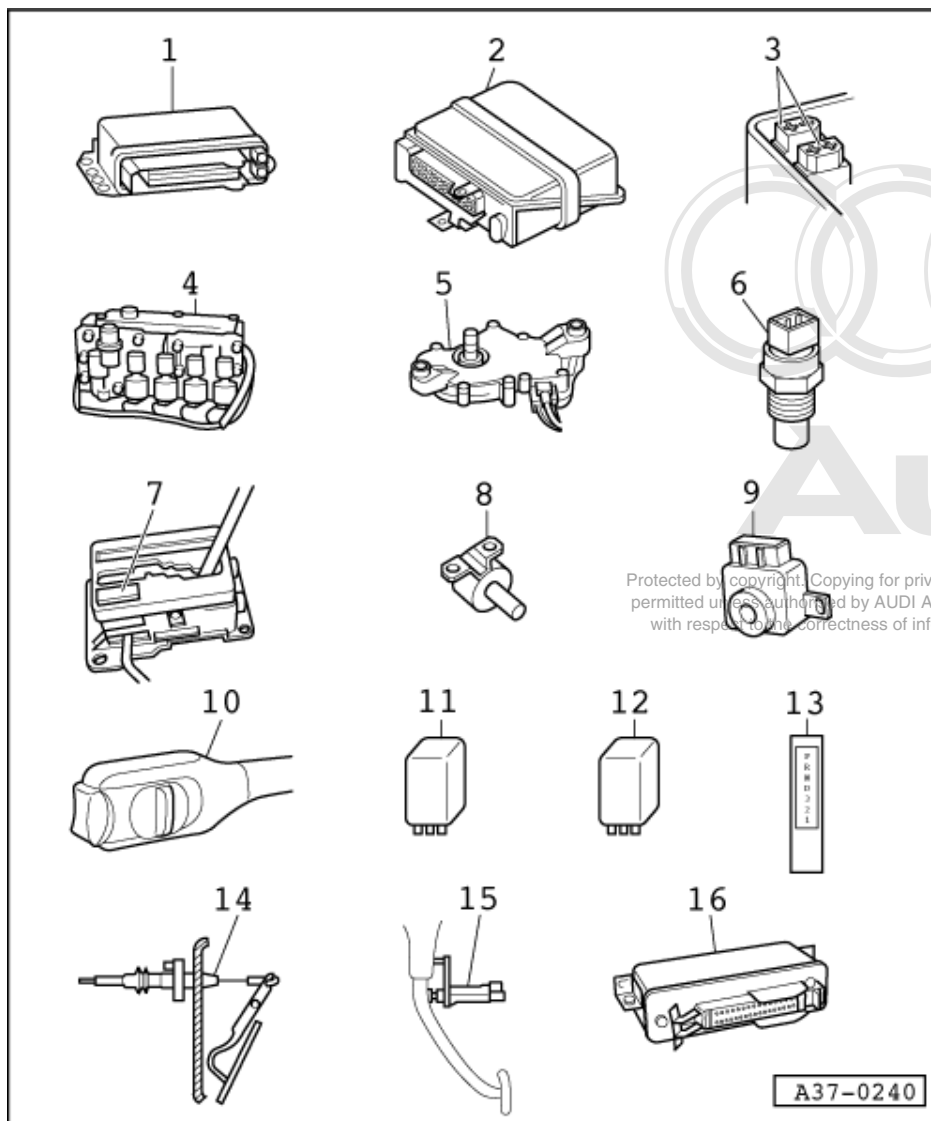
=> Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system Interrogating and erasing fault memory

=> MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI) Interrogating and erasing fault memory

=> MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI) Interrogating and erasing fault memory

=> MPI fuel injection and ignition system (6- Cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI) Interrogating and erasing fault memory

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Note:

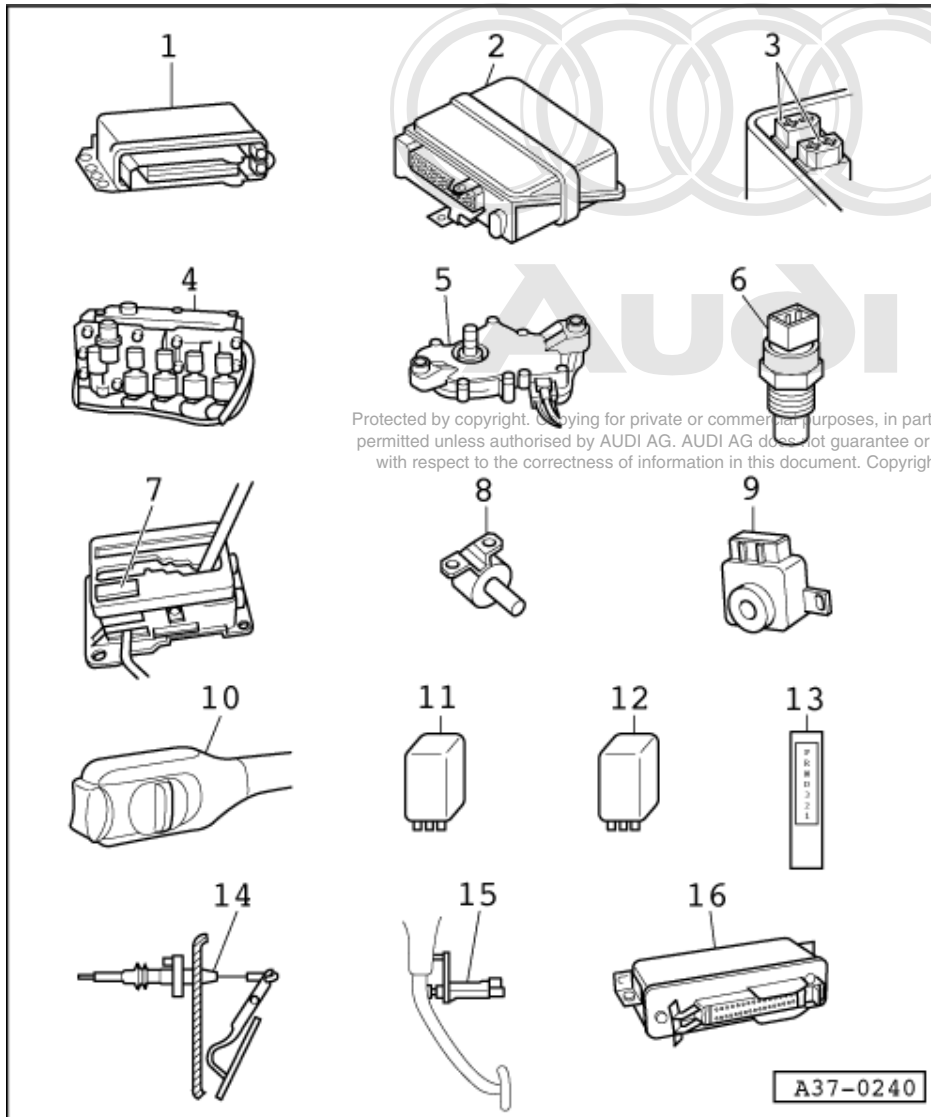
- ◆ For TDI engine, the accelerator position sender -G79 takes over the function of the throttle valve potentiometer
- ◆ Removing, installing and adjusting

=> Diesel direct injection and glow plug system (TDI 5-cyl.); Repair Group 23; Servicing diesel direct injection; Servicing throttle mechanism Servicing diesel direct injection Servicing throttle mechanism

10 Cruise control switch -E45

- ◆ Location: incorporated in steering column switch
- ◆ Checking in electrical test => as of Page **77**
- ◆ Removing and installing

=> Electrical System; Repair Group 94; Servicing steering column switch; Removing and installing steering column switch Servicing steering column switch Removing and installing steering column switch

**11 Starter inhibitor and reversing light relay -J226**

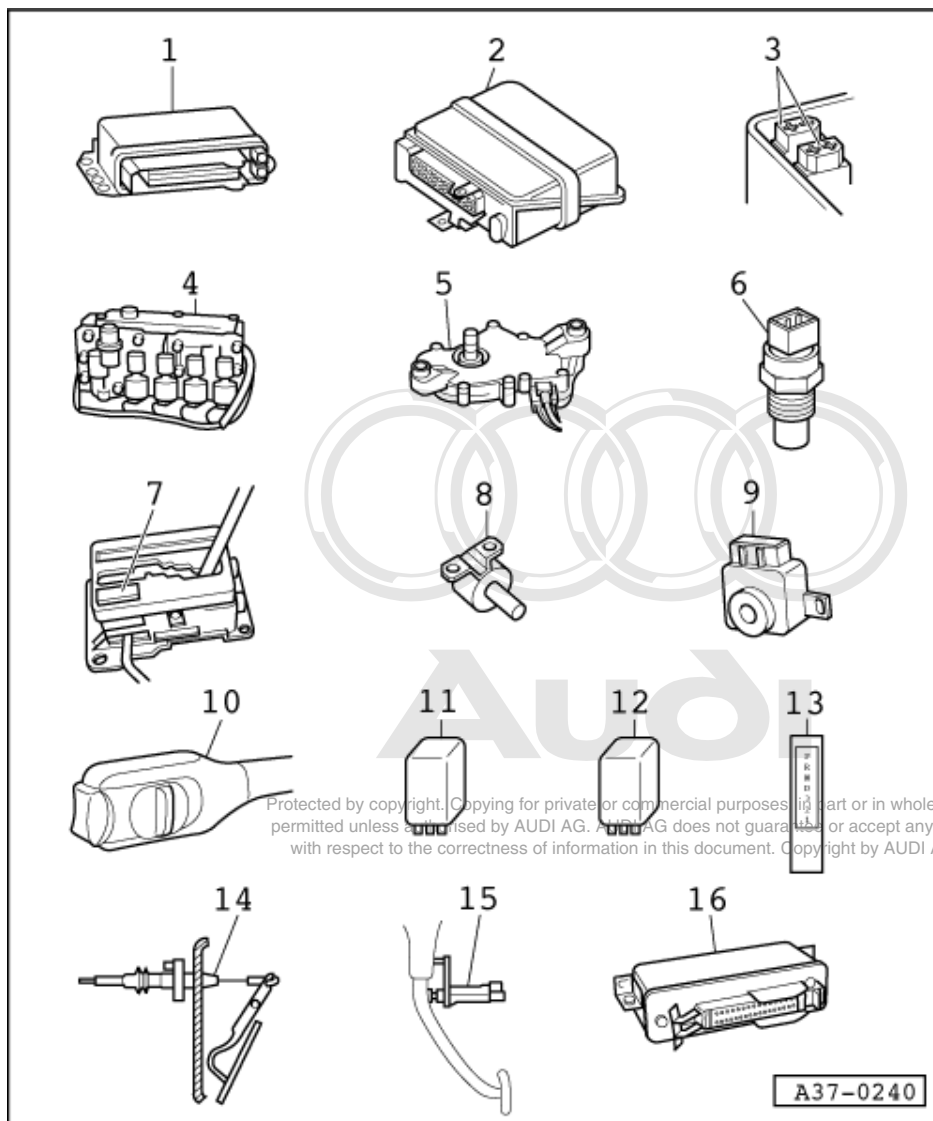
- ◆ in conjunction with control unit, 55-pin => -Pos. **1** -
- ◆ Installation location: In central electrics, relay position 4

11 - Relay for starter inhibitor -J207

- ◆ in conjunction with control unit, 88-pin => -Pos. **1** -
- ◆ Installation location: In central electrics, relay position 4

12 Selector lever lock control unit -J221

- ◆ in conjunction with control unit, 55-pin => -Pos. **1** -
- ◆ Installation location: In auxiliary relay carrier II, relay position 5



12 - Selector lever lock relay -J378

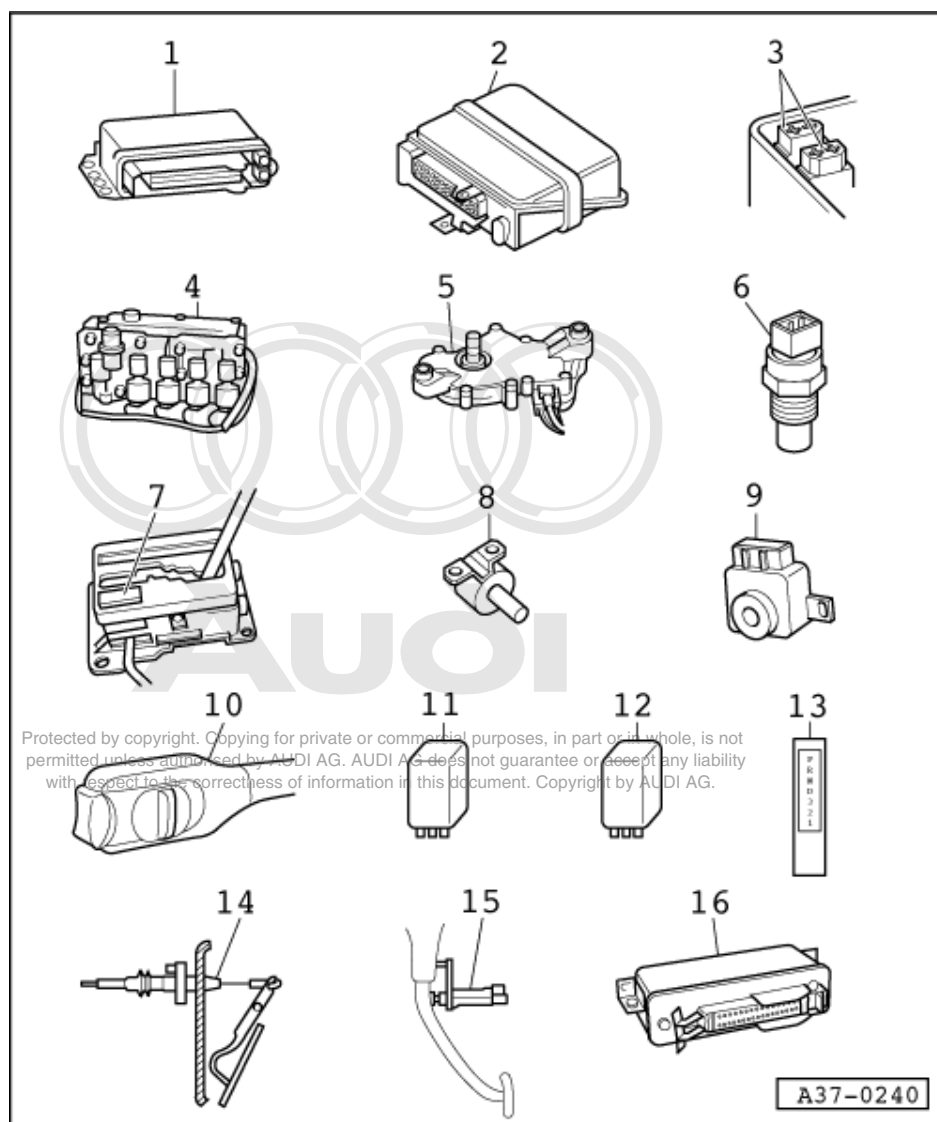
- ♦ in conjunction with control unit, 88-pin => -Pos. **1** -
- ♦ Installation location: In auxiliary relay carrier II, relay position 5

13 Selection range display -Y5

- ♦ Installation location: In the dash panel insert
- ♦ If the gear display does not illuminate, this indicates the gearbox is in emergency running mode and the gearbox control unit is not in operation.
- ♦ If all segments of the gear display illuminate together, this indicates the gearbox is in emergency running mode and the gearbox control unit is in operation.

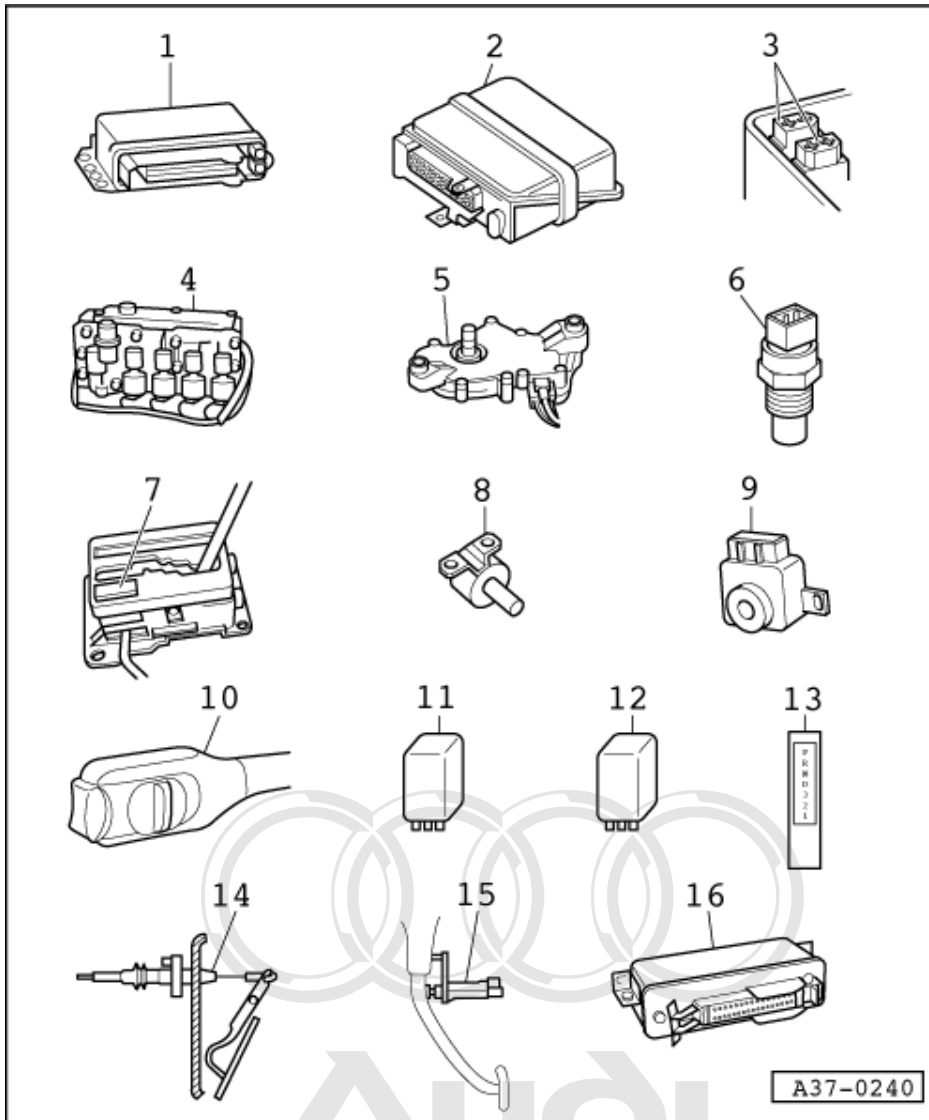
14 Kickdown switch -F8

- ♦ Installation location 2.2 l - 169 kW, 2.8 l - 142 kW: In front of bulkhead integrated into throttle cable



- ◆ Installation location 2.6 l - 110 kW, 2.8 l - 128 kW: On throttle valve unit
- ◆ Adjusting => Page 19 or replace
- ◆ Checking in reading measured value block => as of Page 77
- ◆ Installation location TDI: Integrated in accelerator pedal position sender -G79
- ◆ For the TDI engine, the accelerator pedal position sender -G79 must be replaced and then adjusted in order to replace the kickdown switch

=> Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Servicing throttle actuation; Installing and adjusting accelerator pedal position sender -G79 Servicing throttle actuation Installing and adjusting accelerator pedal position sender -G79



15 Brake light switch -F

- ◆ Location: In pedal assembly
- ◆ Checking in reading measured value block => as of Page 77
- ◆ Removing and installing

=> Running gear four-wheel drive; Repair Group 46; Servicing pedal assembly Servicing pedal assembly

=> Running gear front-wheel drive; Repair Group 46; Servicing pedal assembly Servicing pedal assembly

16 ABS control unit -J104

- ◆ Installation location: On left under rear seat
- ◆ Checked by self-diagnosis for vehicles 07.92 ä

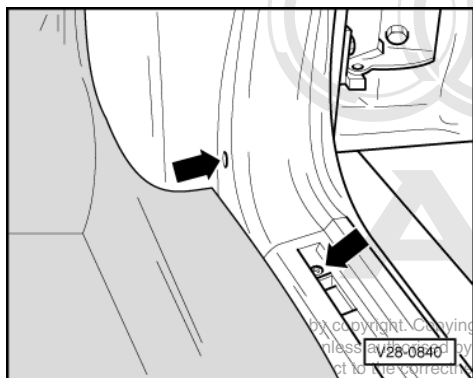
2.2 - Removing and installing control unit for automatic gearbox -J217

Note:

- ◆ If a test indicates a fault in the gearbox control unit and requests its replacement, the fault memory must always be interrogated => Page 46 beforehand. This test must be subsequently repeated.
- ◆ Replace the gearbox control unit only after a repeated test again indicates that the gearbox control unit is defective.



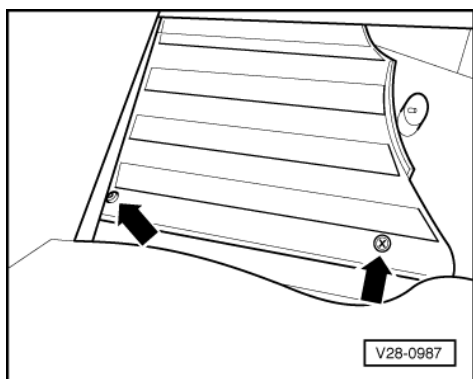
- ♦ The gearbox control unit, 88-pin must be encoded after replacement => Page 47 .



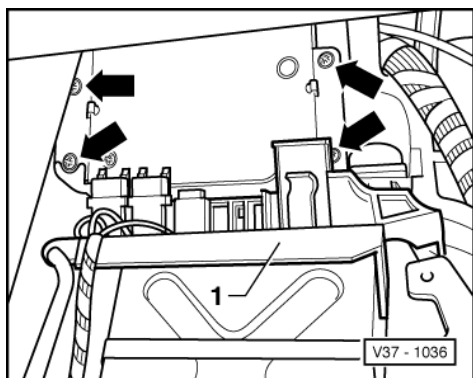
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Removal

- -> Remove lower section of right-hand A-pillar trim and also right-hand sill panel trim around front door.
- Pull back floor covering at front of right-hand footwell. (If necessary, cut open the perforated seam on the left with a knife.)



- -> Unscrew bolts -arrows- for electronics box cover.
- Carefully detach upper and lower sections of cover.



- -> Carefully remove combination carrier -1- with attachments.
- Unscrew gearbox control unit from electronics box -arrows-.
- Release connector lock, detach connector from gearbox control unit => Page 19 .

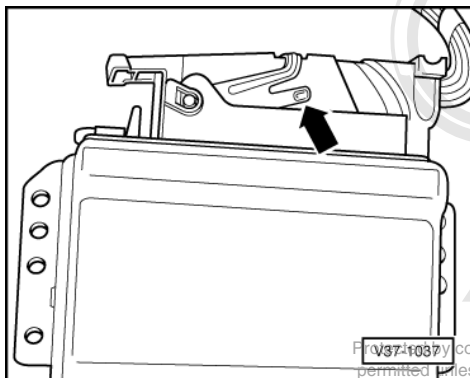
Installing

Install in reverse order, paying attention to the following:

- Check whether there is water in the electronics box and seal any cracks or openings.
- Check wiring.

- Interrogate fault memory of gearbox control unit => Page 24 .

Unplugging connector on automatic gearbox control unit -J217



- Switch off ignition and wait approx. 30 seconds.
- -> Press lock in direction of arrow to release connector.

2.3 - Adjusting kickdown switch -F8

2.2 l - 169 kW, 2.8 l - 142 kW

Note:

Installation location: The kickdown switch is integrated into the throttle cable.

- Adjust throttle cable to adjust kickdown switch

=> 5-cyl. Injection engine (4-valve, turbo), Mechanical components; Repair Group 20; Servicing throttle actuation; Adjusting throttle cable Servicing throttle actuation Adjusting throttle cable

=> 6-cyl. Injection engine (5-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable Adjusting throttle cable

2.6 l - 110 kW and 2.8 l - 128 kW

Note:

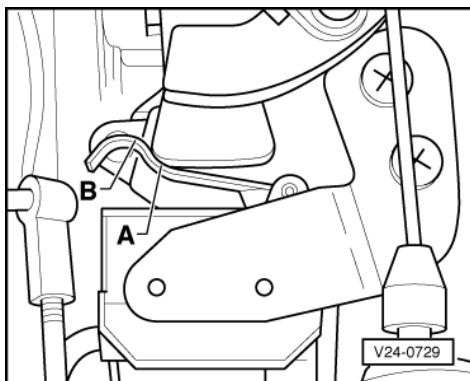
Location: The kickdown switch is fastened to the throttle valve unit.

- Check throttle cable adjustment before adjusting kickdown switch

=> 6-cyl. Injection engine (2.6 l-engine, 2-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable Removing and installing parts of fuel system Adjusting throttle cable

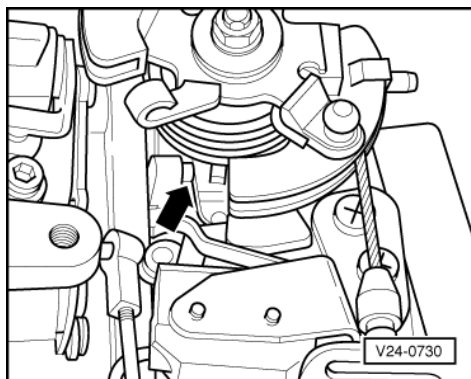
=> 6-cyl. Injection engine (2-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable Removing and installing parts of fuel system Adjusting throttle cable

- Detach intake silencer.
- Disconnect 2-way connector for kickdown switch.

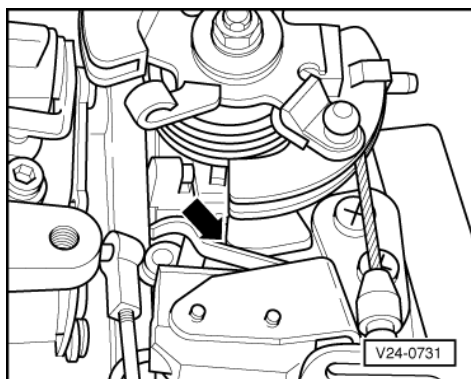




- Using leads from V.A.G 1594 A, connect hand-held multimeter V.A.G 1526 A (resistance measurement) to contacts 1 and 2 of kickdown switch connector.
 - Specified value: $\infty \Omega$
- -> Slowly press accelerator pedal down to the floor: The kickdown switch must be actuated when the kickdown switch lever is depressed in range A ...B by the throttle valve cam.
 - Specification: 0 Ω



- Loosen kickdown switch fastening screw.
- -> Push throttle valve lever manually against full-load stop -arrow-.



- -> Adjust the kickdown switch so that the kickdown switch lever contacts the throttle valve cam -arrow-.
- Tighten fastening bolts and secure with paint.

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3 - Performing self-diagnosis

3.1 - Performing self-diagnosis

3.2 - Safety precautions

Observe the following if testers and measuring instruments have to be used during test drives:

- ♦ Always attach testers and measuring instruments to the back seat and have a second person operate them from there.
- ♦ Operation of testers and measuring instruments from the front passenger seat could result in injuries to the person sitting there in the event of an accident (activation of passenger's airbag).

Warning Mount fault reader on rear seat and operate it from there
--

3.3 - Fault reader V.A.G 1551 and selecting functions

Note:

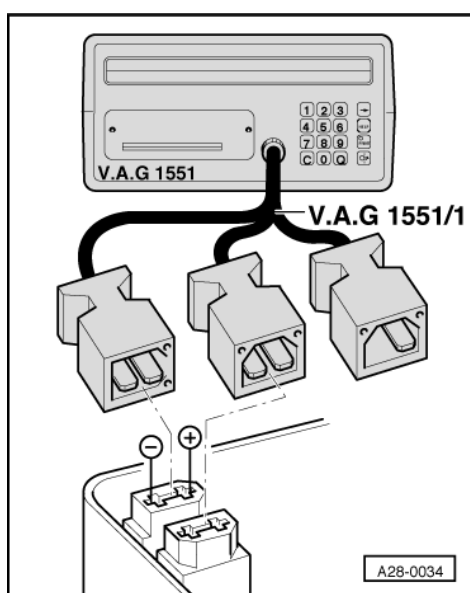
The vehicle tester system V.A.G 1552 can also be used instead of fault reader V.A.G 1551.

Test requirements:

- Vehicle voltage supply okay.
- Voltage supply and fuses for the relevant systems OK
- Earth connections for gearbox okay.

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Project: Audi 100 1991 > Automatic gearbox 01F and 01K, self-diagnosis - Edition 11.1996
 Vehicles with control unit 55-pin font=symbol charset=fontspecific code=225 descr="[lang]"=> Page 4):
 Multi-function switch -F125 OK, engine speed below 2000 rpm.
 The selector lever must be in the P or N position for all functions except "Read measured value block".



- -> With ignition switched off connect fault reader V.A.G 1551 with diagnosis line V.A.G 1551/1 to the diagnostic connectors as follows:
 - Remove cover from auxiliary relay carrier I on left in plenum chamber.
 - Attach black connector to black diagnostic connector.

-> Indicated on display:

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

1) appears alternately

Note:

If no display appears, do not attach white connector. In this case, check voltage supply for black diagnostic connector => Page 130.

- Attach white connector to white diagnostic connector (blue connector is not required).
- Switch ignition on.
- Operate brake pedal once.
- Switch on printer with the Print-key (indicator lamp in key lights up).



- Press key 1 for mode 1, "Rapid data transfer".

-> Indicated on display:

Rapid data transfer HELP
Enter address word XX

Note:

- ♦ By pressing the 0 twice and confirming with the Q key, an automatic test sequence is carried out (fault memory interrogation of all systems).
- ♦ The stored faults are displayed and printed out one after another.

- Press keys 0 and 2 to select "Gearbox electronics".

-> Indicated on display:

Rapid data transfer Q
02 Gearbox electronics

- Confirm entry with Q key.

-> Indicated on display:

Rapid data transfer
Tester transmits address word 02

- Wait approx. 5 seconds.

-> Indicated on display (example):

4A0927156AL AG4 01F 2.8l 5V RoW D26
Coding 00001 WSC 06744

Control unit identification (example)

- 4A0927156AL: Part no.
- AG4 01F: Automatic gearbox (4-gear) 01F;
 display à 06.92: 01D instead of 01F
- 2.8l 5V: Encoding of control unit suitable for
 2.8 l engine 5-valve
- ROW: Rest of the world (all countries except
 USA)
- D26: EPROM (data status)
- Coding 00001: Different codes => Page **47**
- WSC 06744: Workshop Code for the V.A.G 1551
 which was used to perform the last
 encoding

- Press => key.

-> Indicated on display:

Rapid data transfer HELP
Select function XX

- Select function =>Page **23** .
 - A list of the possible functions is printed out after pressing the HELP key:

Notes for fault displays:

-> Indicated on display:

Control unit does not answer!

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- Print a list of possible fault causes by pressing the HELP key.
- After eliminating the possible causes of the fault, again press keys 0 and 2 for "Gearbox electronics" and confirm entry with the Q key.

-> If display re-appears:

Control unit does not answer!	HELP
-------------------------------	------

- Check supply voltage for automatic gearbox control unit -J217 => Electrical testing, as of Page 77 .
- Check wiring to white diagnostic connector => Page 132 .
- Check multifunction switch -F125 electrically => as of Page 106 and check adjustment of multifunction switch -F125

=> Automatic gearbox 01F four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Adjusting multifunction switch -F125 Dismantling and assembling gearbox Adjusting multifunction switch -F125

=> Automatic gearbox 01K front-wheel drive; Repair group 37; Dismantling and assembling gearbox; Adjusting multifunction switch -F125 Dismantling and assembling gearbox Adjusting multifunction switch -F125

- For defective automatic gearbox control unit -J217 => Fault table, as of Page 25 under fault code 65535 "Control unit defective"

-> Indicated on display:

Rapid data transfer	HELP
Communication problem	

or

Rapid data transfer	HELP
L wire not switching to earth	

or

Rapid data transfer	HELP
L wire not switching to positive	

or

Rapid data transfer	HELP
K- wire not switching to earth	

or

Rapid data transfer	HELP
K- wire not switching to positive	

- Print a list of possible fault causes by pressing the HELP key.
- Disconnect wiring between individual systems =>Page 132 .
- After eliminating the possible causes of the fault, again press keys 0 and 2 for "Gearbox electronics" and confirm entry with the Q key.

3.4 - Overview of function selection

	Page
01 - Interrogating control unit version	21
02 - Interrogating fault memory	24



	Page
03 - Final control diagnosis	43
05 - Erase fault memory	46
06 - End of output	
07 - Coding control unit	47
08 - Reading measured value block	66 2)



1) Control unit, 55-pin

2) Control unit, 88-pin

Further functions which are printed out after pressing the HELP key can be ignored.

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After interrogating a function the V.A.G 1551 returns to the following starting position:

-> Indicated on display:

Rapid data transfer	HELP
Select function XX	

3.5 - Interrogating fault memory

Note:

If fault memory cannot be read out, the cause may be as follows:

- ♦ If unknown (meaningless) faults are stored, read-out of the fault memory is prevented by an electronic lock in the control unit. In this case, deletion of the fault memory is also impossible.
 - ♦ The fault memory can be erased by re-encoding the control unit. Subsequently, the control unit must be re-encoded for the correct vehicle type. Encoding => Page 47
- Connect V.A.G 1551 and enter address word 02 for gearbox electronics, confirm and switch to next step => Page 21 .

-> Indicated on display:

Rapid data transfer	HELP
Select function XX	

- Operate brake pedal once.

Note:

The fault "00526 Brake light switch -F" will be displayed when the ignition is switched on. If the brake light switch is okay, this display will then be erased the first time the brake pedal is depressed.

- Press keys 0 and 2 for "Interrogate fault memory".

-> Indicated on display:

Rapid data transfer	Q
02 - Interrogating fault memory	

- Confirm entry with Q key.

-> Indicated on display:

No fault detected!

- Press => key.

or

-> Indicated on display:

X faults detected!

If the printer is switched on, the stored faults will be displayed and printed out in sequence.

- Press ➡ after the last fault is displayed and printed.
- Rectify printed faults according to fault table => Page 46 .

After the fault memory has been interrogated, the V.A.G 1551 returns to the following start position:

-> Indicated on display:

Rapid data transfer HELP
Select function XX

3.6 - Fault table

Note:

- ◆ This table lists all possible faults which can be recognised by automatic gearbox control unit -J217 and displayed on V.A.G 1551 or V.A.G 1552 when the fault memory is interrogated.
- ◆ In the "Rapid Data Transfer" mode, the fault code is only printed out if the V.A.G 1551 printer is switched on. Example: fault code number (5-digit) 65535.
- ◆ If faults occur only sporadically or the fault memory was not erased after fault remedy, these faults are displayed as "sporadically occurring faults" for a fixed period of time; see Fault recognition of gearbox control unit => Page 1 .
- ◆ If defective components are detected when the fault memory is read out, also use the current flow diagram to check the wiring to the components for short circuits and open circuits.

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

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- ◆ If the fault table refers to "Read measured value block" or "Electrical test", perform only the test step listed for the relevant component.

Part I

Output on the V.A.G 1551 printer	
No fault detected!	If "No fault detected!" appears on display after repair self-diagnosis is completed. If the automatic gearbox still does not shift correctly: Interrogate control unit identification => as of Page 43 Continue fault finding procedure according to the Fault Finding Programme => Binder "Fault recognition Power transmission"

3.7 - Fault table from 00258 to 00532

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00258 Solenoid valve 1 -N88	- Open circuit or short to earth/positive	- Check lines and connectors according to current flow diagram 2)



Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
Open circuit 1) Short to earth 1) Short to positive 1)	- Solenoid valve 1 -N88 defective	- Read measured value block => as of Page 77

1) One of these displays will appear in addition to the name of the relevant component.

2) First check connectors for contact corrosion or water damage and replace if necessary. When solenoid valve faults are displayed, pay special attention to the 8-pin connector on the gearbox between valve body and wiring harness.

Note on Fault code 00258:

Short to positive is already checked with ignition switched on. All fault types are recognised during operation.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00260 Solenoid valve 2 -N89 Open circuit 1) Short to earth 1) Short to positive 1)	- Open circuit or short to earth/positive - Solenoid valve 2 -N89 defective	- Check lines and connectors according to current flow diagram 2) - Read measured value block => as of Page 77

1) One of these displays will appear in addition to the name of the relevant component.

2) First check connectors for contact corrosion or water damage and replace if necessary. When solenoid valve faults are displayed, pay special attention to the 8-pin connector on the gearbox between valve body and wiring harness.

Note on Fault code 00260:

Short to positive is already checked with ignition switched on. All fault types are recognised during operation.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00262 Solenoid valve 3 -N90 Open circuit 1) Short to earth 1) Short to positive 1)	- Open circuit or short to earth - Solenoid valve 3 -N90 defective	- Check lines and connectors according to current flow diagram 2) - Read measured value block => as of Page 77

1) One of these displays will appear in addition to the name of the relevant component.

2) First check connectors for contact corrosion or water damage and replace if necessary. When solenoid valve faults are displayed, pay special attention to the 8-pin connector on the gearbox between valve body and wiring harness.

Note on Fault code 00262:

Short to positive is already checked with ignition switched on. All fault types are recognised during operation.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00264 Solenoid valve 4 -N91	- Open circuit or short to earth	- Check lines and connectors according to current flow diagram 2)

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
Open circuit 1) Short to earth 1) Short to positive 1)	- Solenoid valve 4 -N91 defective	- Read measured value block => as of Page 77

- 1) One of these displays will appear in addition to the name of the relevant component.
- 2) First check connectors for contact corrosion or water damage and replace if necessary. When solenoid valve faults are displayed, pay special attention to the 8-pin connector on the gearbox between valve body and wiring harness.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00283 Front left speed sensor -G47 Implausible signal	- Fault in wiring between gearbox control unit and control unit for ABS -J104 - Open circuit between ABS control unit and speed sensor, fuse for ABS control unit defective, rotor dirty, wheel bearing play too large, speed sensor incorrectly installed - Incorrect ABS control unit installed	- Read measured value block => as of Page 77 1) - Fault remedy => "Fault Finding - Anti-lock Brake System - Bosch, ABS Tester V.A.G 1710" binder Additionally, for vehicles 07.92 ä => Running gear, Four-wheel drive; Repair group 01; Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS) Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS)

- 1) First check connectors for contact corrosion and water damage and replace if necessary.

Notes for fault code 00283:

- ♦ Faults for gearbox 01F only.
- ♦ This fault is only recognised if the signal from the relevant speed sensor is missing for at least 0.4 second or is implausible and simultaneously, the other three speed sensors indicate approximately the same driving speed.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00285 Front right speed sensor -G45 Implausible signal	- Fault in wiring between gearbox control unit and control unit for ABS -J104 - Open circuit between ABS control unit and speed sensor, fuse for ABS control unit defective, rotor dirty, wheel bearing play too large, speed sensor incorrectly installed - Incorrect ABS control unit installed	- Read measured value block => as of Page 77 1) - Fault remedy => "Fault Finding - Anti-lock Brake System - Bosch, ABS Tester V.A.G 1710" binder Additionally, for vehicles 07.92 ä => Running gear, Four-wheel drive; Repair group 01; Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS) Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS)

- 1) First check connectors for contact corrosion and water damage and replace if necessary.

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Notes for fault code 00285:

- ♦ Faults for gearbox 01F only.
- ♦ This fault is only recognised if the signal from the relevant speed sensor is missing for at least 0.4 second or is implausible and simultaneously, the other three speed sensors indicate approximately the same driving speed.



Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00287 Rear left speed sensor -G44 Implausible signal	- Fault in wiring between gearbox control unit and control unit for ABS -J104 - Open circuit between ABS control unit and speed sensor, fuse for ABS control unit defective, rotor dirty, wheel bearing play too large, speed sensor incorrectly installed - Incorrect ABS control unit installed	- Read measured value block => as of Page 77 1) - Fault remedy => "Fault Finding - Anti-lock Brake System - Bosch, ABS Tester V.A.G 1710" binder Additionally, for vehicles 07.92 ä => Running gear, Four-wheel drive; Repair group 01; Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS) Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS)

1) First check connectors for contact corrosion and water damage and replace if necessary.

Notes for fault code 00287:

- ♦ Faults for gearbox 01F only.
- ♦ This fault is only recognised if the signal from the relevant speed sensor is missing for at least 0.4 second or is implausible and simultaneously, the other three speed sensors indicate approximately the same driving speed.

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Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00290 Rear right speed sensor -G46 Implausible signal	- Fault in wiring between gearbox control unit and control unit for ABS -J104 - Open circuit between ABS control unit and speed sensor, fuse for ABS control unit defective, rotor dirty, wheel bearing play too large, speed sensor incorrectly installed - Incorrect ABS control unit installed	- Read measured value block => as of Page 77 1) - Fault remedy => "Fault Finding - Anti-lock Brake System - Bosch, ABS Tester V.A.G 1710" binder Additionally, for vehicles 07.92 ä => Running gear, Four-wheel drive; Repair group 01; Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS) Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS)

1) First check connectors for contact corrosion and water damage and replace if necessary.

Notes for fault code 00290:

- ♦ Faults for gearbox 01F only.
- ♦ This fault is only recognised if the signal from the relevant speed sensor is missing for at least 0.4 second or is implausible and simultaneously, the other three speed sensors indicate approximately the same driving speed.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00293 Multi-function switch -F125	- Open circuit or short to earth/positive	- Check lines and connectors according to current flow diagram 1)

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
Implausible signal	- Voltage supply of drive stage Sender (multi-function switch) is interrupted. - Selector lever cable incorrectly adjusted	- Read measured value block => as of Page 66 (Control unit, 88-pin) - Adjust selector lever cable - => Automatic gearbox 01K front-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable - Servicing shift mechanism; Adjusting selector lever cable
	Continued ▼	

1) First check 8-pin connectors for contact corrosion and water damage and replace if necessary.

Note on Fault code 00293:

This fault is detected if all three wiring connections from the gearbox control unit to the multi-function switch - F125 register less than 3 V.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00293 Multi-function switch -F125	(Fault 00293 continued) - Multifunction switch -F125 incorrectly adjusted	- Adjust multifunction switch - => Automatic gearbox 01F four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Adjusting multifunction switch -F125 - Dismantling and assembling gearbox; Adjusting multifunction switch - F125
Implausible signal	- Multi-function switch -F125 defective - Connector to multi-function switch - F125 not plugged in	- Perform electrical test => as of Page 77 - If necessary, replace multi-function switch -F125 - => Automatic gearbox 01F, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125 - Dismantling and assembling gearbox; Removing and installing multi-function switch -F125

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00296 Kickdown switch -F8 Short circuit to earth	- Short to earth between kickdown switch -F8 and gearbox control unit - Open circuit between kickdown switch -F8 and gearbox control unit - Kickdown switch -F8 incorrectly adjusted - Kickdown switch -F8 defective Continued ▼	- Check lines and connectors according to current flow diagram 1) - Read measured value block => as of Page 66 (Control unit, 88-pin) - Adjusting kickdown switch =>Page 77

1) First check connectors for contact corrosion and water damage and replace if necessary.

Notes for fault code 00296:

- ◆ Conditions of fault recognition: Throttle valve signal OK, throttle valve value less than 25% and kickdown input at gearbox control unit has a short to earth (corresponds to kickdown signal).
- ◆ Short to positive or open circuit between kickdown switch -F8 and gearbox control unit cannot be recognised by self-diagnosis.



Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00296 Kickdown switch -F8 Short circuit to earth	(Fault 00296 continued) - Throttle cable incorrectly adjusted	- Adjust or replace throttle cable => 5-cyl. Injection engine (4-valve, turbo), Mechanical components; Repair Group 20; Servicing throttle actuation; Adjusting throttle cable Servicing throttle actuation; Adjusting throttle cable => 6-cyl. Injection engine (2.6 l-engine, 2-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable => 6-cyl. Injection engine (2-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable => 6-cyl. Injection engine (5-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable Removing and installing parts of fuel system; Adjusting throttle cable

Print-out via V.A.G 1551	Possible causes of fault	Fault remedy
00297 Gearbox speed sender -G38 No signal	- Open circuit in gearbox speed sender -G38 - Open circuit in screening for gearbox speed sender -G38 - Gearbox speed sender -G38 dirty or defective - Screening for gearbox speed sender -G38 defective - Drive wheel for gearbox speed sender -G38 defective or broken	- Check lines and connectors according to current flow diagram 1) Read measured value block => as of Page 66 (Control unit, 88-pin) - Perform electrical test => as of Page 77 - Clean or replace gearbox speed sender -G38 => Automatic gearbox 01K front-wheel drive; Repair group 38; Removing and installing gearbox speed sender -G38 Removing and installing gearbox speed sender -G38 => Automatic gearbox 01K front-wheel drive. Rep. Gr. 39; Servicing final drive

1) First check connectors for contact corrosion and water damage and replace if necessary.

Notes for fault code 00297:

- ♦ Faults for gearbox 01K only.
- ♦ Loss of voltage is checked by self-diagnosis.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00300 Gearbox oil temperature sender -G93 Short to earth 1) Open circuit/short to earth 2)	- Open circuit/short circuit - Sender for gearbox oil temperature -G93 defective	- Check lines and connectors according to current flow diagram 3) - Read measured value block => as of Page 77

	- ATF-level not OK	- Check ATF level => Automatic gearbox 01F four-wheel drive; Repair group 37; Checking and changing ATF; Checking ATF level Checking and changing ATF; Checking ATF level ▪ The gearbox oil temperature (ATF) sender -G93 is integrated into the wiring harness in the gearbox.
--	--------------------	---

- 1) Additional fault recognition: Detected ATF temperature below -50 °C.
- 2) Additional fault recognition: Detected ATF temperature above 180 °C.
- 3) First check 8-pin connectors on gearbox between valve body and wiring harness for contact corrosion and water damage and replace if necessary.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00518 Throttle valve potentiometer -G69 Implausible signal 1)	- Wiring connection between throttle valve potentiometer -G69 and engine control unit defective or faulty contact Continued ▼	- Fault remedy according to fault codes 16504, 16505, 16506 and 16507 of engine control unit. - Perform electrical test => as of Page 77

- 1) Whether the signal is too large or too small is stored in the fault memory of the engine control unit.

Notes for fault code 00518:

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- ♦ Petrol engines: The signal from the throttle valve potentiometer -G69- or from throttle valve unit -J338 is sent to the gearbox control unit (as digital signal) via the engine control unit.
- ♦ TDI engines: The signal from the throttle valve potentiometer -G69- is sent to the gearbox control unit (as digital signal) via the engine control unit.
- ♦ Condition for fault recognition: Signal detected by gearbox control unit 1 second longer or shorter than permitted.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00518 Throttle valve potentiometer -G69 Implausible signal 1)	(Fault 00518 continued) - Throttle valve potentiometer -G69 or throttle valve unit -J338 defective	- Interrogating fault memory => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory => Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory => Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system; Interrogating and erasing fault memory



Continued ▼

- 1) Whether the signal is too large or too small is stored in the fault memory of the engine control unit.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00518 Throttle valve potentiometer -G69 Implausible signal 1)	(Fault 00518 continued) - Throttle valve potentiometer - -G69 or throttle valve unit -J338 defective	- Interrogating fault memory => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory => MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory

- 1) Whether the signal is too large or too small is stored in the fault memory of the engine control unit.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00526 Brake light switch -F Implausible signal	- Brake light switch -F defective - Open wiring or short to earth/positive between gearbox control unit and brake light switch -F	- Check lines and connectors according to current flow diagram - Read measured value block => as of Page 77 If necessary, Replace brake light switch -F

Notes for fault code 00526:

- ♦ The fault is always displayed when the ignition is turned on and is then cancelled by pressing the brake pedal once, providing brake light switch -F is okay.
- ♦ Before interrogating fault memory briefly operate brake pedal in order to erase pre-set fault.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00529 Speed information missing Open circuit/Short to earth1) Short to positive 1) Implausible signal 1)	- Fault in wiring between engine and gearbox control unit or rev counter - Short circuit in rev counter - Engine speed signal is falsified by incorrectly routed electric line (e.g. retrofitting of telephone) Continued ▼	- Check lines and connectors according to current flow diagram Read measured value block => as of Page 66 (Control unit, 88-pin) - Perform electrical test => as of Page 77

- 1) One of these displays will appear in addition to the name of the relevant component.

Notes for fault code 00529:

- ♦ The engine speed signal is sent to the gearbox control unit (as digital signal) via the engine control unit.

- | Output on the V.A.G 1551 printer | Possible causes of fault | Fault remedy |
|--|---|--|
| 00529
Speed information missing | (Fault 00529 continued)
- Fault in signal from engine speed sender -G28 to engine control unit
- Engine speed sender -G28 defective | - Interrogate fault memory or fault remedy according to fault code 16706 of engine control unit
=> Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory
Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory |
| Open circuit/Short to earth1)
Short to positive 1)
Implausible signal 1) | - Engine control unit defective | => Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory
=> Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory |
| | Continued ▼ | |

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00529 Speed information missing	(Fault 00529 continued) - Fault in signal from engine speed sender -G28 to engine control unit	- Interrogate fault memory or fault remedy according to fault code 16706 of engine control unit => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory

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Open circuit/Short to earth 1) Short to positive 1) Implausible signal 1)	- Engine speed sender -G28 defective - Engine control unit defective	=> MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory => MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory
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1) One of these displays will appear in addition to the name of the relevant component.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00532 Supply voltage Open circuit/short to earth 1)2) Signal too small 1)2)	- On-board voltage below 9 V - Fault in wiring in voltage supply for gearbox control unit or solenoid valve - Poor earth connection for gearbox control unit	- Test electrical system and repair if necessary. - Read measured value block => as of Page 77
Output does not switch/short circuit to positive 1)3) Output does not switch/short circuit to earth 1)3)	- Voltage supply for solenoid valves interrupted - Relay or transistor in gearbox control unit (for voltage supply to solenoid valves) defective	- Perform electrical test => as of Page 77, if necessary gearbox control unit

1) One of these displays will appear in addition to the name of the relevant component.

2) Additional fault recognition: detected engine speed over 1600 rpm and supply voltage to gearbox control unit less than 9 V for at least 2 seconds.

3) Additional fault recognition: short to positive/earth at contact (on gearbox control unit) for supply voltage to solenoid valves.

3.8 - Fault table from 00543 to 65535

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00543 Maximum revs exceeded Engine speed	- Fault in wiring between engine and gearbox control unit (earth) - Engine speed signal is falsified by incorrectly routed electric line (e.g. retrofitting of telephone) - Fault in signal from engine speed sender -G28 to engine control unit - Engine speed sender -G28 defective - Engine speed limitation defective - Engine control unit defective	- Check lines and connectors according to current flow diagram - Reading measured value block => as of Page 77 - Interrogate fault memory or fault remedy according to fault code 16706 of engine control unit => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
	Continued ▼	

Notes for fault code 00543:

- ◆ Fault only for control unit, 88-pin (MY 96 +; gradual introduction).
- ◆ The engine speed signal is sent to the gearbox control unit (as digital signal) via the engine control unit.
- ◆ Condition for fault recognition: Signal detected by gearbox control unit 1 second longer or shorter than permitted.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00543 Maximum revs exceeded	(Fault 00543 continued) - Fault in signal from engine speed sender -G28 to engine control unit	- Interrogate fault memory or fault remedy according to fault code 16706 of engine control unit => Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system; Interrogating and erasing fault memory
Engine speed	- Engine speed sender -G28 defective - Engine speed limitation defective - Engine control unit defective - Incorrect engine control unit installed 1)	=> Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory

1) Manual gearbox control unit-Version (5-cylinder turbo).

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00543 Maximum revs exceeded	(Fault 00543 continued) - Fault in signal from engine speed sender -G28 to engine control unit	- Interrogate fault memory or fault remedy according to fault code 16706 of engine control unit => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory
Engine speed	- Engine speed sender -G28 defective - Engine speed limitation defective - Engine control unit defective	=> MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory
	Continued ▼	

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00543 Maximum revs exceeded	(Fault 00543 continued) - Impermissible change down of gear-box (e.g. through mechanically defective valve body)	- ad measured value block =>as of Page 66 and check during driving which elements are defective or not activated



Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
Engine speed		- If necessary, replace solenoid valves or valve body => Automatic gearbox 01F four-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body

Part II

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00545 Engine/gearbox electrical connection Ignition intervention Open circuit/Short to earth1) Short to positive 1)	- The ignition was switched on with gearbox control unit connector disconnected. - Fault in wiring between engine and gearbox control unit Continued ▼	• No fault remedy - Check lines and connectors according to current flow diagram - Read measured value block => as of Page 77

1) One of these displays will appear in addition to the name of the relevant component.

Note on Fault code 00545:

The self-diagnosis system monitors the wiring to the engine control unit which transmits the signal requiring ignition retardation or a reduction of injection quantity during a gearshift.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00545 Engine/gearbox electrical connection Ignition intervention Open circuit/Short to earth1) Short to positive 1)	(Fault 00545 continued) - Engine control unit defective Continued ▼	- Check engine control unit => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory => Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory => Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory

1) One of these displays will appear in addition to the name of the relevant component.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
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00545 Engine/gearbox electrical connection	(Fault 00545 continued) - Engine control unit defective	- Check engine control unit => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory => MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory
Ignition intervention		
Open circuit/Short to earth1) Short to positive 1)		

1) One of these displays will appear in addition to the name of the relevant component.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00548 Voltage supply for fault memory Open circuit/Short to earth	- Fuse defective - Fault in wiring in supply voltage terminal 30 - Poor earth connection for gearbox control unit	- Check lines and connectors according to current flow diagram - Perform electrical test => as of Page 77

Notes for fault code 00548:

- ♦ Fault only for control unit, 55-pin (➤ approx. 08.95).
- ♦ When the system voltage (terminal 30) fails, learned and stored values are lost, i.e. the gearbox control unit must re-learn these values after restart. The shifting quality may be worse than normal during this learning procedure.
- ♦ If there is a cut-off in the permanent positive supply, any faults detected by self-diagnosis may be lost after the ignition is turned off.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00549 Consumption signal	- Connectors between engine and gearbox control units loose or defective - Fault in wiring between engine and gearbox control unit or vehicle computer - The signal is suppressed by a fault in the vehicle computer	- Check lines and connectors according to current flow diagram - Read measured value block => as of Page 77 - Rectify fault in the dash panel insert => Electrical System; Repair Group 90; Servicing dash panel insert Servicing dash panel insert
Short to earth 1) Open circuit/short to positive1)		
	Continued ▼	

1) One of these displays will appear in addition to the name of the relevant component.

**Note on fault code 00549:**

Condition for fault recognition: During driving operation, no fuel consumption signal must be detected by the gearbox control unit for at least 2.5 seconds. Engine speed and throttle valve signal OK

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00549 Consumption signal Short to earth 1) Open circuit/short to positive1)	(Fault 00549 continued) - Short in wiring between engine control unit and vehicle computer - Engine control unit defective Continued ▼	- Check engine control unit => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory => Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory => Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system; Interrogating and erasing fault memory

- 1) One of these displays will appear in addition to the name of the relevant component.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00549 Consumption signal Short to earth 1) Open circuit/short to positive1)	(Fault 00549 continued) - Engine control unit defective	- Check engine control unit => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory => MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory

- 1) One of these displays will appear in addition to the name of the relevant component.

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Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00597 Differing wheel speed impulses Speed deviation too great	- Fault in wiring between gearbox control unit and control unit for ABS -J104 - Open circuit between ABS control unit and speed sensor, fuse for ABS control unit defective - At least 2 speed sensors detect incorrect signals as rotor dirty, rotor with incorrect number of teeth, wheel bearing play too large or speed sensor incorrectly installed - Incorrect ABS control unit installed	- Reading measured value block => as of Page 77 1) - Fault remedy => "Fault Finding - Anti-lock Brake System - Bosch, ABS Tester V.A.G 1710" binder => Running gear, Four-wheel drive; Repair group 01; Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS) Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS)

1) First check connectors for contact corrosion and water damage and replace if necessary.

Notes on fault code 00597:

- ♦ Fault only for control unit, 88-pin (MY 96 ➤; gradual introduction).
- ♦ This fault is only recognised if the signals from at least two speed sensors are missing completely, are implausible for varying time periods or all detected wheel speed signals indicate different driving speeds.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00638 Engine/gearbox electrical connection 2 Open circuit/Short to earth1) Short to positive 1)	- Connectors between engine and gearbox control units loose or defective - Fault in wiring between engine and gearbox control unit - Throttle valve signal not transmitted to gearbox control unit Continued ▼	- Check lines and connectors according to current flow diagram - Read measured value block =>Page 66 (Control unit, 88-pin) - Carry out electrical test => Page 77

1) One of these displays will appear in addition to the name of the relevant component.

Notes on fault code 00638:

- ♦ Petrol engines: The signal from the throttle valve potentiometer -G69- or from throttle valve unit -J338 is sent to the gearbox control unit (as digital signal) via the engine control unit.
- ♦ TDI engines: The signal from the throttle valve potentiometer -G69- is sent to the gearbox control unit (as digital signal) via the engine control unit.
- ♦ Condition for fault recognition: No signal must be detected by gearbox control unit for more than 1 second. Detected engine speed greater than 600 rpm

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Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00638 Engine/gearbox electrical connection 2	(Fault 00638 continued) - No signal from engine control unit	- Check engine control unit => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory



Open circuit/Short to earth1) Short to positive 1) Audi Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.	Continued ▼	=> Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory => Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system; Interrogating and erasing fault memory
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1) One of these displays will appear in addition to the name of the relevant component.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00638 Engine/gearbox electrical connection 2 Open circuit/Short to earth1) Short to positive 1)	(Fault 00638 continued) - No signal from engine control unit	- Check engine control unit => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory => MPI fuel injection and ignition system (6-Cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory

1) One of these displays will appear in addition to the name of the relevant component.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00652 Gear monitoring Implausible signal	- Incorrect encoding of gearbox control unit - Incorrect encoding of engine control unit	- Interrogate control unit identification =>as of Page 47 - Control unit identification and interrogate encoding => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis of Motronic system; Interrogating and erasing fault memory

	Continued ▼	
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Note on fault code 00652:

The ratio of engine speed to gearbox output speed (wheel speed) is implausible with gear engaged.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00652 Gear monitoring Implausible signal	(Fault 00652 continued) - Incorrect encoding of engine control unit Continued ▼	- Control unit identification and interrogate encoding => Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system; Interrogating and erasing fault memory => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating and erasing fault memory => MPI Fuel Injection and Ignition System (6-cyl.) à 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00652 Gear monitoring Implausible signal	(Fault 00652 continued) - Engine speed or gearbox output speed defective and not recognised by self-diagnosis - Multifunction switch -F125 defective and not recognised by self-diagnosis - Selector lever position N was engaged in during driving Continued ▼	- Perform fault remedy according to fault code 00529, 00283, 00285, 00287 or 00290 - Perform fault remedy according to fault code 00293 ▪ No fault remedy; selector lever positions P and N must not be engaged during driving

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00652 Gear monitoring Implausible signal	(Fault 00652 continued) - ATF-level not OK - Defective or incorrect converter - Valve body or solenoid valve defective - Clutches or brakes slipping Continued ▼	- Check ATF level => Automatic gearbox 01F four-wheel drive; Repair group 37; Checking and changing ATF; Checking ATF level Checking and changing ATF; Checking ATF level - Check converter code Carry out final control diagnosis =>Page 66 (Control unit, 88-pin) and check during driving which elements are defective or not activated ▪ Black, burnt ATF indicates worn clutch or brake

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
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00652 Gear monitoring Implausible signal	(Fault 00652 continued) - Open circuit between ABS control unit and speed sensor, fuse for ABS control unit defective 1) - At least 2 speed sensors defective 1) - Incorrect ABS control unit installed 1)	- Fault remedy => "Fault Finding - Anti-lock Brake System - Bosch, ABS Tester V.A.G 1710" binder - Additionally, for vehicles 07.92 ä => Running gear, Four-wheel drive; Repair group 01; Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS) Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS)
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1) Only gearbox 01F.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00668 Vehicle voltage terminal 30 Open circuit/short circuit to earth	- Fuse defective - Fault in wiring in supply voltage terminal 30	- Check lines and connectors according to current flow diagram - Perform electrical test => as of Page 77

Notes on fault code 00668:

- ♦ Fault only for control unit, 88-pin (MY 96 ➤; (gradual introduction).
- ♦ When the system voltage (terminal 30) fails, learned and stored values are lost, i.e. the gearbox control unit must re-learn these values after restart. The shifting quality may be worse than normal during this learning procedure.
- ♦ The fault must be detected 5 times consecutively after "ignition off/on", before it is stored in the fault memory.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
00753 Elec. connections for wheel speed impulse Implausible signal	- Fault in wiring between gearbox control unit and control unit for anti-lock brake system -J104 - Fault in the voltage supply for speed sensor outputs or ABS control unit - Incorrect ABS control unit installed	- Reading measured value block => as of Page 77 1) - Fault remedy => "Fault Finding - Anti-lock Brake System - Bosch, ABS Tester V.A.G 1710" binder Additionally, for vehicles 07.92 ä => Running gear, Four-wheel drive; Repair group 01; Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS) Anti-lock brake system (ABS), Model Year 1993; Fault table (ABS)

1) First check connectors for contact corrosion and water damage and replace if necessary.

Notes on fault code 00753:

- ♦ Faults for gearbox 01F only with control unit, 55-pin (➤ approx. 08.95).
- ♦ This fault is only recognised if, during driving, none of the 4 wheel speed impulses from the gearbox control unit are detected, i.e. open circuit or fault in all 4 speed sensors.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
01044 Control unit incorrectly encoded	- Control unit detects an invalid and accepted encoding	- Interrogate control unit identification => as of Page 47

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
		- If necessary, replace control unit => Page 4

Notes on fault code 01044:

- ♦ Fault only for control unit, 88-pin (MY 96 ➤; gradual introduction).
- ♦ If the self-diagnosis recognises this fault, the gearbox control unit sets the coding to 00000.

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
01236 Selector lever lock solenoid -N110	- Fuse for selector lever lock voltage supply defective - Fault in wiring for supply voltage to solenoid -N110	- Check lines and connectors according to current flow diagram Reading measured value block => as of Page 66 - Perform electrical test => as of Page 77

- 1) One of these displays will appear in addition to the name of the relevant component.

Note on fault code 01236:

Fault only for control unit, 88-pin (MY 96 ➤; gradual introduction).

Output on the V.A.G 1551 printer	Possible causes of fault	Fault remedy
65535 Control unit faulty	- Automatic gearbox control unit -J217 defective	- Replace control unit => Page 4

Notes on fault code 65535:

The automatic gearbox control unit -J217 should only be renewed after the possible cause of the fault has been determined and the following faults have been remedied:

- ♦ mechanical faults;
- ♦ hydraulic faults;
- ♦ affected electric/electronic components and wiring connections;
- ♦ moisture in electronics box or gearbox control unit.

The gearbox control unit, 88-pin must be encoded after replacement => Page 47.

3.9 - Performing final control diagnosis

Note:

- ♦ Final control diagnosis can only be performed if the selector lever is in position P or N, the engine is not running and the vehicle is stationary.
- ♦ The final control diagnosis is terminated if the engine is started or if a wheel speed pulse or gearbox speed signal is detected.
- ♦ The function of the solenoid valve 1 -N88, solenoid valve 2 -N89 and solenoid valve 3 -N90 as well as the CCS relay, solenoid valve relay and the selector lever lock solenoid are acoustically tested during the final control diagnosis. During the acoustic testing, ambient noise must be avoided as the switching noise (clicking) of the control elements is extremely quiet.
- ♦ Diode test lamp V.A.G 1527 B and auxiliary leads from V.A.G 1594 A are required for checking solenoid valve 4 -N91.
- ♦ After switching on the ignition, only a complete final control diagnosis is possible.
- ♦ To repeat the final control diagnosis, the ignition must be switched off and on again.
- ♦ During the final control diagnosis, the individual control elements are activated for only 30 seconds. The following display appears if the ➡key is not pressed within these 30 seconds:



-> Indicated on display:

Function unknown or cannot
be carried out at present.

- Press the ➡ key again and re-initiate final control diagnosis in order to continue final control diagnosis.

Actuation sequence	
1	Solenoid valve 1 -N88
2	Solenoid valve 2 -N89
3	Solenoid valve 3 -N90
4	Solenoid valve 4 -N91
5	Relay (CCS)
6	Kickdown switch -F8 (kickdown for air conditioner)
7	Relay for solenoid valves
8	Selector lever lock solenoid -N110 1)

- 1) for control unit, 88-pin (MY 96 ä; gradual introduction)

- Connect fault reader V.A.G 1551, enter address word "02 Gearbox electronics" and switch further until "Select function XX" is displayed => from Page 21 .

-> Indicated on display:

Rapid data transfer HELP
Select function XX

- Press keys 0 and 3 for "Final control diagnosis".

-> Indicated on display:

Rapid data transfer Q
03 - Final control diagnosis

- Confirm entry with Q key.

-> Indicated on display:

Final control diagnosis
Solenoid valve 1 -N88

- Valve is activated for 30 seconds (clicks). Within this time, press the ➡ key to switch to the next control element.
 - If the valve is not activated, check component =>Electrical test as of Page 125 .

-> Indicated on display:

Final control diagnosis
Solenoid valve 2 -N89

- Valve is activated for 30 seconds (clicks). Within this time, press the ➡ key to switch to the next control element.
 - If the valve is not activated, check component =>Electrical test as of Page 125 .

-> Indicated on display:

Final control diagnosis
Solenoid valve 3 -N90

- Valve is activated for 30 seconds (clicks). Within this time, press the ➡ key to switch to the next control element.
 - If the valve is not activated, check component =>Electrical test as of Page 125 .
- Connect diode test lamp V.A.G 1527 B => Checking activation of solenoid valves, Page 125 .

-> Indicated on display:

Final control diagnosis
Solenoid valve 4 -N91

- Valve is activated for 30 seconds. The diode test lamp V.A.G 1527 B must flash (light / dark). Within this time, press the ➡ key to switch to the next control element.
 - If the valve is not activated (diode test lamp does not illuminate or illuminates continuously), perform electrical test => as of Page **102** (Control unit, 88-pin).

-> Indicated on display:

Final control diagnosis
Relay

Control unit, 55-pin (ä approx. 08.95):

- CCS relay (in gearbox control unit) is activated for 30 seconds (clicks).
 - If the relay is not activated (does not click), perform electrical test => as of Page **77**.

Control unit, 88-pin (MY 96 ä; gradual introduction).

Note:

The CCS relay is replaced by a transistor in this control unit. No clicking is audible during final control diagnosis.

- If necessary, perform electrical test => as of Page **102**.

All vehicles:

- Within 30 seconds, press the ➡ key to switch to the next control element.

-> Indicated on display:

Final control diagnosis
Kickdown switch -F8

Note:

- ♦ The air conditioner shut-off function in the gearbox control unit is activated and not the kickdown switch - F8.
 - ♦ This display can be disregarded.
 - ♦ For control unit 88-pin, the signal can be checked in measured value block => as of Page **67**.
 - ♦ Check function "Kick-down-Schalter -F8" => Electrical test as of Page **102** (Control unit, 88-pin).
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- Press the ➡ key to switch to the next control element.

-> Indicated on display:

Final control diagnosis
Relay for solenoid valves

Control unit, 55-pin (ä approx. 08.95):

- Relay for solenoid valves (in gearbox control unit) is activated for 30 seconds (clicks).
 - If the relay is not activated (does not click), perform electrical test => as of Page **126**.

Control unit, 88-pin (MY 96 ä; gradual introduction).

Note:

The relay for solenoid valves is replaced by a transistor in this control unit. The clicking of all solenoid valves is audible during final control diagnosis.

- If necessary, perform electrical test => as of Page **102**.



All vehicles:

- Within 30 seconds, press the ➡ key to switch to the next control element.

-> Indicated on display:

Final control diagnosis
Selector lever lock solenoid -N110

- Solenoid for selector lever lock -N110 is activated for 30 seconds (clicks). Within this time, press the ➡ key to switch to the next control element.
- If the selector lever lock solenoid -N110 is not activated (does not click), =>Electrical test as of Page 102 (Control unit, 88-pin).
- Press ➡ key.

-> Indicated on display:

Function unknown or cannot
be implemented at present.

- Press ➡key to end final control diagnosis.

-> Indicated on display:

Rapid data transfer HELP
Select function XX

- To repeat the final control diagnosis, the ignition must be switched off and on again.

3.10 - Erase fault memory

Prerequisite:

- Fault memory interrogated => Page 24

After fault memory has been successfully interrogated:

-> Indicated on display:

Rapid data transfer HELP
Select function XX

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- Press buttons 0 and 5 for "Interrogate fault memory".

-> Indicated on display:

Rapid data transfer Q
05 - Erase fault memory

- Confirm entry with Q key.

-> Indicated on display:

Warning
Fault memory not interrogated

Sequence has not been correctly followed. The fault memory must first be interrogated.

Note:

If, for example, the ignition is switched off between interrogation of fault memory and erasure of the fault memory, the fault memory is not erased.

-> Indicated on display:

Rapid data transfer
Fault memory is erased.

The fault memory will only be erased approx. 5 seconds after this display appears.

Note:

Before interrogating the fault memory again, wait approx. 1 minute.

-> Indicated on display:

System is not ready for interrogation.

- Wait for print out with printer switched on.

-> In case of fault message on print out:

1 No fault detected!
00811 3333
System is not ready for interrogation.

Gearbox control unit has not been given enough time to recognise faults.

- Before interrogating the fault memory again, wait approx. 1 minute.
- After interrogating and erasing of fault memory carry out test drive and interrogate fault memory again.

-> Indicated on display:

No fault detected!

Fault memory interrogation performed correctly.

3.11 - Coding control unit

Note:

Control unit, 88-pin (MY 96 ➤ ; gradual introduction) must be encoded after replacement.

- Connect fault reader V.A.G 1551, enter address word "02 Gearbox electronics" and switch further until "Select function XX" is displayed => from Page 21 .

-> Indicated on display:

Rapid data transfer HELP
Select function XX

- Press buttons 0 and 7 for the "Code control unit" function.

Note:

Encoding is only possible with ignition switched on and selector lever position P or N. Accelerator pedal must remain in idling position.

-> Indicated on display:

Rapid data transfer Q
07 - Coding control unit

- Confirm entry with Q key.

-> Indicated on display:

Coding control unit
Enter code number XXXXX (0 - 32000)

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- Enter code number according to coding table.

Coding	Engine	Country
00000	2.8 I 2V 128 kW 2.5 I TDI 85 kW	USA RoW 1)
00001	2.8 I 2V 128 kW 2.8 I 5V 142 kW 2.5 I TDI 85 kW	RoW 1) RoW 1) RoW 1)
00002	2.6 I 2V 110 kW	RoW 1)
00003	2.2 I 4VT 169 kW 2.4 I 2V	RoW 1) Thailand
0001X	Dynamic shifting programme is deactivated (only fixed, economic shift curves)	

- 1) RoW: Rest of the world (all countries except USA)

Note:

- ♦ Encoding 00000 ... 00003 is not available for all control units.
- ♦ The fault memory can be erased by re-encoding the control unit => Page 24 .

-> Indicated on display:

Coding control unit Q
Enter code number 00001

- Confirm entry with Q key.

-> Indicated on display:

4A0927156AL AG4 01F 2.8l 5V RoW D26
Coding 00001 WSC 06744

- Press => key.

Note:

-> Indicated on display:

Fault ☐
Coding XXXXX not accepted

- ♦ An attempt was made to enter a coding which is not recognised by the control unit.
- ♦ If an incorrect coding was entered, the control unit retains the old coding.
- ♦ With older V.A.G 1551 test cards only, the control unit identification is displayed with the old code after entering an invalid coding.

-> Indicated on display:

Rapid data transfer
Select function XX

HELP
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- Press keys 0 and 1 for "Interrogate control unit version" function, confirm entry with Q key and check coding => Page 48 .

The function cannot be performed
Enter workshop code

-> Indicated on display:

- Enter workshop code

=> Operating instructions; V.A.G 1551 fault reader

3.12 - Read measured value block, vehicles with 2.8 l - 128 kW > approx. 09.92

Control unit, 55-pin

Part No. for control unit:

Automatic gearbox	Part no.
Gearbox 01F	4A0 927 156
	4A0 927 156 A
	4A0 927 156 B
Gearbox 01K	4A0 927 156 G

Note:

- ◆ If displayed values are to be read out while moving, a second operator is required.
 - ◆ Observe safety precautions => Page 20
 - ◆ The engine speed must not exceed 2000 rpm. The function "Read measured value block" is terminated if the engine speed limit is exceeded.
 - ◆ In this case, after reading measured value block, interrogate engine and gearbox control unit fault memories and erase if necessary. Interrogate fault memory => Page 46 .
- Connect fault reader V.A.G 1551, enter address word "02 Gearbox electronics" and switch further until "Select function XX" is displayed => from Page 21 .

-> Indicated on display:

Rapid data transfer	HELP
Select function XX	

- Press buttons 0 and 8 to read "Measured value block".

-> Indicated on display:

Rapid data transfer	Q
08 - Reading measured value block	

- Confirm entry with Q key.

-> Indicated on display:

Reading measured value block	Q
Enter display group number XX	

- Press 0 key twice for display group number 00.
- Confirm entry with Q key.

-> Indicated on display:

Read measured value block						00
1	2	3	4	5	6	7
8	9					

- ◆ For the display group number 00, the display appears in 9 display zones => Test table, Page 50 .
 - ◆ The display values are shown in decimal form.
 - ◆ If specified values in the test table are not attained, proceed according to Measures table => Page 51 .
- Press ⇒ key.



Test table

Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Comment on displayed value
1	ATF temperature	▪ Exact display only possible above 40 °C	0 ... 255	Displayed value minus 50 gives ATF temperature in °C
2	Throttle valve position	▪ in idling position	0 ... 5	Displayed value increasing or decreasing evenly and analogously to accelerator pedal position
		▪ Press accelerator pedal further	5 ... 253	
3	Engine speed	▪ Engine running at idling speed	16 ... 60	Displayed value increasing or decreasing evenly and analogously to the engine speed
4	Fuel consumption signal	▪ Engine running at idling speed	20 ... 100	Displayed value increasing or decreasing evenly and analogously to the engine speed

Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Comment on displayed value
5	Wheel speed front left	▪ Accelerate vehicle evenly from standstill	0 ...	Displayed value increasing or decreasing evenly with respect to driving speed For gearbox 01K, the gearbox output speed from gearbox speed sender - G38 is displayed 4 times.
6	Wheel speed front right		0 ...	
7	Wheel speed rear left		0 ...	
8	Wheel speed rear right		0 ...	

Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value with / without program switch		Comment on displayed value
(cont.) ▼	Switch position 1	▪ Selector lever in position P ▪ Program switch in "sport" position ▪ Brake not actuated	56	-	Checking program switch -E122
	Switch position 2	▪ Selector lever in position P ▪ Program switch not actuated (economy) ▪ Brake not actuated	57	56	Checking multifunction switch -F125
	Switch position 3	▪ Selector lever in position P ▪ Program switch not actuated (economy) ▪ Brake actuated	59	58	Checking brake light switch -F

Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value with / without program switch		Comment on displayed value
9	Switch position 4	▪ Selector lever in position P ▪ Program switch not actuated (economy) ▪ Brake not actuated ▪ Kickdown actuated	61	60	Checking kickdown switch -F8
	Switch position 5	▪ Program switch not actuated (economy) ▪ Brake actuated	51	50	Checking position of multifunction switch -F125
	Switch position 6	Selector lever in position N	43	42	
	Switch position 7	Selector lever in position D	35	34	
	Switch position 8	Selector lever in position 3	27	26	
	Switch position 9	Selector lever in position 2	19	18	
	Switch position 10	Selector lever in position 1	11	10	

Measures table

The required tests are listed in case the specified display values in the test table are not attained (=> Page 50).

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Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
1	constant 130	ATF temperature	- Fault in wiring between gearbox control unit and gearbox oil temperature (ATF) sender -G93 - Gearbox oil temperature (ATF) sender -G93 defective	- Check wiring and components => Electrical test as of Page 77
2 (cont.) ▼	constant 76	Accelerator pedal value (throttle valve position)	- Missing or incorrect signal from throttle valve potentiometer -G69 to engine control unit	- Read out fault memory of engine control unit and rectify fault if necessary => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory



Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
2	constant 76	Accelerator pedal value (throttle valve position)	- Faulty signal output from engine control unit or engine control unit defective - Fault in wiring between engine and gearbox control unit - Poor earth connection for gearbox control unit	- Checking output signal for throttle valve position => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 24; Servicing Multi-Point-Injection System; Checking output signal for throttle valve position Servicing Multi-Point-Injection System; Checking output signal for throttle valve position - Check wiring => Electrical test as of Page 77 - Test wiring using current flow diagram

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Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
3	≤16	Engine speed	- Idling speed below specified value - Faulty signal from engine speed sender -G28 to engine control unit - Fault in wiring between engine and gearbox control units or rev counter - Faulty output signal from engine control unit or engine control unit defective - Fault in wiring between engine control unit and rev counter or rev counter defective	- Interrogate fault memory and basic setting of engine control unit => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory - Check wiring => Electrical test as of Page 77 - Check actuation of rev counter => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 24; Servicing Multi-Point-Injection System; Checking actuation of rev counter Servicing Multi-Point-Injection System; Checking actuation of rev counter Test wiring using current flow diagram

Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
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4	lower than 20	Fuel consumption signal	- Idling speed below specified value - Fault in wiring between engine and gearbox control unit - Faulty output signal from engine control unit or engine control unit defective - Fault in wiring between engine control unit and vehicle computer or vehicle computer defective	- Interrogate fault memory and basic setting of engine control unit => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating and erasing fault memory - Check wiring => Electrical test as of Page 77 - Testing actuation of vehicle computer for fuel consumption display => MPI Fuel Injection and Ignition System (6-cyl.) ä 05.94; Repair Group 24; Servicing Multi-Point-Injection System; Checking actuation of vehicle computer (fuel consumption display) Servicing Multi-Point-Injection System; Checking actuation of vehicle computer (fuel consumption display) Test wiring using current flow diagram
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Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
5	0 or implausible	Wheel speed front left	- Fault in wiring between gearbox control unit and ABS control unit	- Check wiring, carry out electrical test => as of Page 77
6	0 or implausible	Wheel speed front right	- Speed sensor defective incorrectly seated	- For gearbox 01F => Fault table as of Page 25, fault codes 00283, 00285, 00287 and 00290
7	0 or implausible	Wheel speed rear left	- Fault in wiring to ABS control unit	- For gearbox 01K => Fault table as of Page 25, fault code 00297
8	0 or implausible	Wheel speed rear right		

Display zone	Readout on V.A.G 1551 with / without program switch		Designation	Cause of fault	Fault remedy
9	57	-	Switch position 1	- Fault in wiring to program switch -E122 - Program switch -E122 defective	- Check wiring and components => Electrical test as of Page 77



Display zone	Readout on V.A.G 1551 with / without program switch		Designation	Cause of fault	Fault remedy
(cont.) ▼	57	56	Switch position 2	- Selector lever cable incorrectly adjusted	- Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable => Automatic gearbox 01K front-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable

Display zone	Readout on V.A.G 1551 with / without program switch		Designation	Cause of fault	Fault remedy
9	larger or smaller		Switch position 2	- Multifunction switch - F125 incorrectly adjusted	- Adjust multifunction switch -F125 => Automatic gearbox 01F four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Adjusting multifunction switch -F125 => Automatic gearbox 01K front-wheel drive; Repair group 37; Dismantling and assembling gearbox; Adjusting multifunction switch -F125 Dismantling and assembling gearbox; Adjusting multifunction switch - F125
(cont.) ▼	57	56		- Fault in wiring between -F125 and gearbox control unit - Multifunction switch - F125 defective	- Check wiring and components => Electrical test as of Page 77

Display zone	Readout on V.A.G 1551 with / without program switch		Designation	Cause of fault	Fault remedy
9	57	56	Switch position 3	- Fault in wiring between brake light switch -F and gearbox control unit - Brake light switch -F defective	- Check wiring and components => Electrical test as of Page 77

Display zone	Readout on V.A.G 1551 with / without program switch		Designation	Cause of fault	Fault remedy
(cont.) ▼	57	56	Switch position 4	- Fault in wiring to kick-down switch -F8 - Throttle cable incorrectly adjusted - Kickdown switch -F8 defective	- Check wiring and components => Electrical test as of Page 77

Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
9 (cont.) ▼	Display outside specified value range	Switch position 5	- Multifunction switch - F125 or selector lever cable incorrectly adjusted - Fault in wiring between multifunction switch - F125 and gearbox control unit - Multifunction switch - F125 defective	- Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable
	Display outside specified value range	Switch position 6	- Brake light switch -F defective	- Adjust multifunction switch => Automatic gearbox 01F four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Adjusting multifunction switch -F125
	Display outside specified value range	Switch position 7		- Check wiring and components => Electrical test as of Page 77

Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
9	Display outside specified value range	Switch position 8	- Multifunction switch - F125 or selector lever cable incorrectly adjusted - Fault in wiring between multifunction switch - F125 and gearbox control unit - Multifunction switch - F125 defective	- Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable
	Display outside specified value range	Switch position 9	- Brake light switch -F defective	- Adjust multifunction switch => Automatic gearbox 01F four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Adjusting multifunction switch -F125 Dismantling and assembling gearbox; Adjusting multifunction switch - F125



Display zone	Readout on V.A.G 1551	Designation	Cause of fault	Fault remedy
	Display outside specified value range	Switch position 10		- Check wiring and components => Electrical test as of Page 77

3.13 - Read measured value block, vehicles with 2.8 l - 128 kW approx. 09.92 ä, 2.2 l - 169 kW, 2.5 l TDI - 85 kW, 2.6 l - 110 kW

Control unit, 55-pin ä approx. 08.95

Control unit in conjunction with 2.8 l - 128 kW:

Automatic gearbox	Part no.
Gearbox 01F	4A0 927 156 M 4A0 927 156 AC and subsequent
Gearbox 01K	4A0 927 156 N 4A0 927 156 Q and subsequent

Note:

- ♦ If displayed values are to be read out while moving, a second operator is required.
 - ♦ Observe safety precautions => Page 20
 - ♦ The display group numbers 001 ... 005 replace the display group number 00. Display group number 00 produces no acceptable displays and must therefore not be selected.
 - ♦ The engine speed must not exceed 2000 rpm. The function "Read measured value block" is terminated if the engine speed limit is exceeded.
 - ♦ In this case, after reading measured value block, interrogate engine and gearbox control unit fault memories and erase if necessary. Interrogate fault memory => Page 46.
- Connect fault reader V.A.G 1551, enter address word "02 Gearbox electronics" and switch further until "Select function XX" is displayed => from Page 21.

-> Indicated on display:

Rapid data transfer HELP
Select function XX

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- Press buttons 0 and 8 to read "Measured value block".

-> Indicated on display:

Rapid data transfer Q
08 - Reading measured value block

- Confirm entry with Q key.

-> Indicated on display:

Reading measured value block Q
Enter display group number XXX

- Enter display group number => Page 57.
- Confirm entry with Q key.

-> Indicated on display (example):

Reading measured value block 1
1 2 3 4

For reading measured value block, the display appears in 4 display zones (if necessary, in physical values).

Note:

- ◆ Decoding of values in the individual display zones => Test table, Page 58 .
- ◆ If the printer is switched on, the current display will be printed out on the record slip.
- If the specified values are achieved in all display zones, press the => key.
- The V.A.G 1551 returns to the following starting position:

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Rapid data transfer
 Select function XX

List of Display Group numbers for selection

Note:

Display group number 00 produces no acceptable displays and must therefore not be selected.

Indicated on display (example):	Display group no.	Display zone	Designation
Reading measured value block 900 rpm 2.16 l/h	001	1 2 3 4	Engine speed Fuel consumption signal Gearbox speed Solenoid valves
Reading measured value block 5 % 12 %	002	1 2 3 4	Accelerator pedal value Throttle valve angle Switch position Control element supply voltage
Reading measured value block D 011	003	1 2 3 4	Selector lever position Multifunction switch position Switch position Current shift map

Indicated on display (example):	Display group no.	Display zone	Designation
Reading measured value block 0.2 A 5	004	1 2 3 4	Pressure control current Engine torque Fuel consumption signal ATF temperature
Reading measured value block 5 rpm 5 rpm	005	1 2 3 4	Wheel speed front left Wheel speed front right Wheel speed rear right Wheel speed rear left



Test table

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001	1	Engine speed	With engine running	...rpm (min: 30 rpm) Value increasing evenly and analogously to engine speed	- Carry out electrical test => as of Page 25, fault codes 00529 and 00543 Interrogate the fault memory for engine control unit => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory => Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating fault memory
(cont.) ▼					

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001	1	Engine speed	With engine running	...rpm (min: 30 rpm) Value increasing evenly and analogously to engine speed	- Interrogate the fault memory for engine control unit => MPFI Fuel Injection and Ignition System (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating fault memory Self-diagnosis for Multi-Point-Injection (MPI); Interrogating fault memory => MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating fault memory
(cont.) ▼					

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001	2	Fuel consumption signal 1)	during driving	... l/h	- Carry out electrical test => Page 25, fault code 00549

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
(cont.) ▼	3	Gearbox speed	during driving with the engine running	...rpm	- Value must increase evenly and analogously to driving speed - Carry out electrical test => as of Page 25, fault code 00297

1) Signal corresponds to opening time of injectors in milliseconds.

Notes on gearbox speed:

- ♦ For gearbox 01F, the mean value of the four speed sensors is displayed.
- ♦ For gearbox 01K, the detected speed from gearbox speed sender -G38 is displayed.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value			Action in the event of deviation from specified value
001	4	Solenoid valves	during driving	N90	N89	N88	Substitute programs initiated by the gearbox control unit may prevent gear changing
			1st gear	0	1	0	If gears do not shift but the selected shifts are displayed, then there may be a defect in the gearbox hydraulics
			2nd gear	0	1	1	=> Binder "Faults in recognition. power transmission" - Perform final control diagnosis => Page 43
			3rd gear	0	0	1	Carry out electrical test => as of Page 77
			4th gear	0	0	0	=> Fault table as of Page 25, fault codes 00258, 00260 and 00262

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Note for solenoid valves:

Inactive solenoid valves are displayed as "0" and active solenoid valves as "1".

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
002	1	Accelerator pedal value	Stationary Accelerator pedal in idling position	0 ...1 %	When accelerating from idling to full throttle the % value is continually increased

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
(cont.) ▼			Depress accelerator pedal to full throttle position	≤ 100 %	- => Fault table as of Page 25, fault codes 00518 and 00638
	2	Throttle valve angle	Stationary Accelerator pedal in idling position	10 ...15 %	- Carry out electrical test => as of Page 77
			Depress accelerator pedal to full throttle position	≤ 100 %	▪ Maximum value => Audi 80 1992 ä; Motronic Fuel Injection and Ignition System (5-cyl.); Repair Group 01; Motronic self-diagnosis; Reading measured value block Self-diagnosis for Multi-Point-Injection (MPI); Reading measured value block

Display group no.	Display zone	Designation	Test conditions		Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
002	3	Switch adjustment 1) Brake light switch Display 1	Brake	actuated	1	- => Fault table as of Page 25 , fault code 00526
		-F		not operated	0	- Check brake light switch -F => Electrical testing as of Page 77
		Kickdown switch 2	Kickdown	actuated	1	- Check kickdown switch -F8 =>Electrical test as of Page 77
(cont.) ▼		-F8		not actuated	0	

1) The readout on V.A.G 1551 in display zone 3 is in 6-digit form, i.e. 100000. The 1st position from the left (display 1) corresponds to the brake light switch -F. The 2nd position from the left (display 2) corresponds to the kickdown switch -F8 etc.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
002	3	Cruise control system	Driving speed ≥ 30 km/h	0	- Carry out electrical test => as of Page 77
			is activated D, 3, 2, 1)	1	▪ Only for vehicles with CCS.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
(cont.) ▼		Air condition- 4 er kickdown 2)		-	▪ Disregard.

- 1) The selector lever must be positioned in the appropriate gear for this test.
- 2) Switching off of air conditioner for kickdown.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
002	3	Spontaneous Display shift 5 program in- crease	active.	1	▪ Disregard.
			not active	0	
		Torque re- 6 duction 1)	during driv- active. ing	1	- Check wiring ac- cording to current flow diagram, con- tact assignment => Electrical test as of Page 77 - => Fault table as of Page 25, fault code 00545
			not active	0	
	4	Control element supply voltage	Ignition switched on	approx. bat- tery voltage	- Check voltage sup- ply for gearbox con- trol unit and solenoid valve, => Electrical test as of Page 77

- 1) Retardation of ignition timing or reduction of injection quantity during a gear change. (Depending on the situation, engine torque reduction may only be active for a very brief period. Since the data transmission to the V.A.G 1551 is relatively slow, the display may not register the engine torque reduction signal under certain circumstances.)

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Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	1	Selector lever posi- tion	Stationary Selector lev- er in gear: P	P	- Check multifunction switch -F125 => dis- play zone 2 Check wiring and components => Elec- trical test as of Page 77 Check correspond- ence with display in dash panel insert



(cont.) ▼			R	R	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable
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Note on selector lever adjustment:

The gear engaged via the selector lever is determined by the multifunction switch -F125.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	1	Selector lever position	Stationary Selector lever in gear: N	N	- Check multifunction switch -F125 => display zone 2 Check wiring and components => Electrical test as of Page 77 Check correspondence with display in dash panel insert
(cont.) ▼			D	D	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	1	Selector lever position	Stationary Selector lever in gear: 3	3	- Check multifunction switch -F125 => display zone 2 Check wiring and components => Electrical test as of Page 77 Check correspondence with display in dash panel insert

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
(cont.) ▼			2	2	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable
			1	1	=> Automatic gearbox 01K front-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	2	Multi-function switch -F125	Stationary Selector lever position	2 3 4 1)	- Check wiring and components => Electrical test as of Page 77
(cont.) ▼			P	1 0 0	- Check selector lever position Check correspondence with display in dash panel insert
			R	1 1 0	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable

1) Connector contacts of multifunction switch -F125. Contact assignment => Fig., Page 106 .

Note on multifunction switch -F125:

The input signals from the multi-function switch -F125 can be tested via the gearbox control unit.



Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	2	Multi-function switch -F125	Stationary Selector lever position	2 3 4 1)	- Check wiring and components => Electrical test as of Page 77
(cont.) ▼			N	0 1 0	- Check correspondence with display in dash panel insert Check selector lever position
			D	0 1 1	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value	
003	2	Multi-function switch -F125	Stationary	Selector lever position 3	1 1 1	- Check wiring and components => Electrical test as of Page 77
				2	1 0 1	- Check selector lever position
				1	0 0 1	- Check correspondence with display in dash panel insert => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable
			in event of fault	0 0 0	- => Fault table as of Page 25 , fault code 00293	
(cont.) ▼						

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Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	3	Switch position	=> Display group number 002, display zone 3		
	4	Current shift map	in driving operation, with engine running	min: S1	

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
		S1 = reserved driving style S5 = sporty driving style S6 = warm-up phase		max: S6	The warm-up program S6 is activated for each engine start at gearbox oil temperatures below 71 °C. After approx. 1 minute, the program switches to a shift map S1 ... S5

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004 (cont.) ▼	1	Pressure control current -N91	With engine running at stall speed:	min: 0.1 A approx. 0.7 A max: 1.1 A	- Perform final control diagnosis => Page 43 - Check wiring and components => Electrical test as of Page 25, fault code 00264

Notes on pressure control current -N91:

- ♦ High current = low modulation pressure (e.g. when driving at a low engine speed and with low engine torque).
- ♦ Low current = high modulation pressure (e.g. when driving at a high engine speed and with high engine torque).

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	2	Engine torque	during driving	min: 0 Value increasing analogously to torque	The gearbox control unit calculates the engine torque from the fuel consumption and engine speed signals
	3	Fuel consumption signal	=> Display group number 001, display zone 2		
	4	ATF temperature	stationary with engine running	...°C	Check wiring and components => Electrical test as of Page 25, fault code 00300

Notes on ATF temperature:

- ♦ A continuously displayed temperature below - 50 °C indicates a short circuit to earth in the wiring for the gearbox oil temperature (ATF) sender -G93.
- ♦ A continuously displayed temperature above + 180 °C indicates open circuit or short circuit to positive in the wiring for the gearbox oil temperature (ATF) sender -G93.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
005	1	Wheel speed front left	during driving	...rpm (min: 0 rpm)	- The speeds must increase or decrease evenly and analogously to the road speed - Check wiring => Electrical test as of Page 77
	2	Wheel speed front right			



Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
	3	Wheel speed rear right			- => Fault table from Page 25, fault codes 00283, 00285, 00287 and 00290
	4	Wheel speed rear left			

Note on wheel speed:

For gearbox 01K, the gearbox speed from the gearbox speed sender -G38 is displayed in this display group number.

3.14 - Reading measured value block, vehicles with control unit, 88-pin (MY 96 >; gradual introduction)

Note:

- ♦ If displayed values are to be read out while moving, a second operator is required.
 - ♦ Observe safety precautions => Page 20.
 - ♦ The display group numbers are extended to 001 ... 011.
 - ♦ Under adverse conditions and at high engine speeds, the function "Read measured value block" may be terminated due to the increased data transfer rate to V.A.G 1551.
 - ♦ In this case, after reading measured value block, interrogate engine and gearbox control unit fault memories and erase if necessary. Interrogate fault memory => Page 46.
- Connect fault reader V.A.G 1551, enter address word "02 Gearbox electronics" and switch further until "Select function XX" is displayed => from Page 21.

-> Indicated on display:

```
Rapid data transfer      HELP
Select function XX
```

- Press buttons 0 and 8 to read "Measured value block".

-> Indicated on display:

```
Rapid data transfer      Q
08 - Reading measured value block
```

- Confirm entry with Q key.

-> Indicated on display:

```
Reading measured value block      Q
Enter display group number XXX
```

- Enter display group number => Page 67.
- Confirm entry with Q key.

-> Indicated on display (example):

```
Reading measured value block      1
1      2      3      4
```

For reading measured value block, the display appears in 4 display zones (if necessary, in physical values).

Note:

- ♦ Decoding of values in the individual display zones => Test table, Page 68.

- ♦ If the printer is switched on, the current display will be printed out on the record slip.
- If the specified values are achieved in all display zones, press the ➔ key.
- The V.A.G 1551 returns to the following starting position:

-> Indicated on display:

Rapid data transfer	HELP
Select function XX	

List of Display Group numbers for selection

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Indicated on display (example):	Display group no.	Display zone	Designation
Reading measured value block 1 ➔ 50 rpm 1	001	1 2 3 4	Engine speed Pressure control current -N91 Gearbox speed Selected gear
Reading measured value block 2 ➔ 50 rpm 1	002	1 2 3 4	Current shift map Accelerator pedal value Gearbox speed Selected gear
Reading measured value block 3 ➔ 0 km/h 11.7 V Brake PN deactivated	003	1 2 3 4	Brake light switch -F Selector lever lock solenoid -N110 Road speed Supply voltage

Indicated on display (example):	Display group no.	Display zone	Designation
Reading measured value block 4 ➔ 45 °C D 011 -	004	1 2 3 4	ATF temperature Selector lever position Position of multifunction switch -F125 Torque reduction
Reading measured value block 5 ➔ M1 M2 M 3	005	1 2 3 4	Solenoid valve 1 -N88 Solenoid valve 2 -N89 Solenoid valve 3 -N90 Selected gear
Reading measured value block 6 ➔ Kickdown 100 % 82 % -	006	1 2 3 4	Kickdown switch -F8 Accelerator pedal value Accelerator pedal value-duty cycle Overrun / traction operation
Reading measured value block 7 ➔ 40 Nm 900 rpm 8 % 4 ms	007	1 2 3 4	Engine torque Engine speed Accelerator pedal value Fuel consumption signal

Indicated on display (example):	Display group no.	Display zone	Designation
Reading measured value block 8 ➔ 1 - 2.57 900 rpm	008	1 2 3 4	Torque increase in converter Engine speed Selected gear Traction control system
Reading measured value block 9 ➔ D 80 km/h version Compr. CCS off	009	1 2 3 4	Selector lever position Road speed Voltage supply for cruise control system Air conditioner kickdown



Indicated on display (example):	Display group no.	Display zone	Designation
Reading measured value 10 ⇒ block 5 rpm 5 rpm	010	1 2 3 4	Wheel speed front left Wheel speed front right Wheel speed rear right Wheel speed rear left
Reading measured value 11 ⇒ block	011	Currently not applicable	

Test table

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001	1	Engine speed	With engine running	...rpm (min: 30 rpm) Value increasing evenly and analogously to engine speed	- Carry out electrical test => as of Page 25, fault codes 00529 and 00543 Interrogate the fault memory for engine control unit => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory => Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating fault memory
(cont.) ▼					

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001	1	Engine speed	With engine running	...rpm (min: 30 rpm) Value increasing evenly and analogously to engine speed	- Interrogate the fault memory for engine control unit => Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating fault memory Self-diagnosis for Multi-Point-Fuel-Injection (MPFI); Interrogating fault memory => MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point-Injection (MPI); Interrogating fault memory
(cont.) ▼					

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001 (cont.) ▼	2	Pressure control current -N91	with engine running at stall speed:	min: 0.1 A approx. 0.8 A max: 1.1 A	- Perform final control diagnosis => Page 43 - Check wiring and components => Electrical test as of Page 25, fault code 00264

Notes on pressure control current -N91:

- ♦ High current = low modulation pressure (e.g. when driving at a low engine speed and with low engine torque).
- ♦ High current = high modulation pressure (e.g. when driving at a high engine speed and high engine torque).

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001 (cont.) ▼	3	Gearbox speed	in driving operation, with engine running	...rpm	▪ Value must increase evenly and analogously to driving speed Carry out electrical test => as of Page 25, fault code 00297

Notes on gearbox speed:

- ♦ For gearbox 01F, the mean value of the four speed sensors is displayed.
- ♦ For gearbox 01K, the detected speed from gearbox speed sender -G38 is displayed.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
001	4	Selected gear	during driving	Selector lever position	▪ Substitute programs initiated by the gearbox control unit may prevent gear changing ▪ If gears do not change but the selected changes are displayed, then there may be a defect in the gearbox hydraulics: - Perform final control diagnosis => Page 43 - Carry out electrical test => as of Page 77 - => Fault table as of Page 25, fault code for relevant solenoid valves - Check selector lever position => Display group number 004, display zone 2
				D	
				3	
				2	
				1	
			R	R	



Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
002 (cont.) ▼	1	Current shift map S1 = reserved driving style S5 = ing style S6 = sporty driving style warm-up phase	during driving, with engine running	1 ... 5 6	▪ The warm-up program S6 is activated for each engine start at gearbox oil temperatures below 71 °C. After approx. 1 minute, the program switches to a shift map S1 ... S5
	2	Accelerator pedal value	Stationary Accelerator pedal in idling position	0 ... 1 %	▪ When accelerating from idling to full throttle the % value is continually increased
			Depress accelerator pedal to full throttle position	≤ 100 %	- => Fault table as of Page 25, fault codes 00518 and 00638

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Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
002	3	Gearbox speed	during driving, with engine running	...rpm	▪ Value must increase evenly and analogously to driving speed Carry out electrical test => as of Page 25, fault code 00297
	4	Selected gear	=> Display group number 001, display zone 4		

Notes on gearbox speed:

- ♦ For gearbox 01F, the mean value of the four speed sensors is displayed.
- ♦ For gearbox 01K, the detected speed from gearbox speed sender -G38 is displayed.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	1	Brake light switch -F	Brake operated	Brake	- => Fault table as of Page 25, fault code 00526
			not actuated	-	- Check brake light switch -F => Perform electrical testing as of Page 77
	2	Selector lever lock solenoid -N110	Stationary active	P N active	- => Fault table as of Page 25, fault code 01236

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
(cont.) ▼			not active	P N non active	- Check selector lever lock solenoid - N110 => Electrical test as of Page 77

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
003	3	Road speed	during driving	... km/h	▪ Display of speedometer and values at V.A.G 1551 may differ slightly. Check gearbox speed or wheel speeds => display group no. 001, display zone 3, or display group no. 010, display zone 1 ... 4
	4	Supply voltage (Terminal 15)	Ignition switched on	approx. battery voltage	- Check voltage supply for gearbox control unit and solenoid valve, => Electrical test as of Page 25, fault code 00532

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004 (cont.) ▼	1	ATF temperature	stationary with engine running	... °C	- Check wiring and components => Electrical test as of Page 25, fault code 00300

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Notes on ATF temperature:

- ♦ A continuously displayed temperature below - 50 °C indicates a short circuit to earth in the wiring for the gearbox oil temperature (ATF) sender -G93.
- ♦ A continuously displayed temperature above + 180 °C indicates open circuit or short circuit to positive in the wiring for the gearbox oil temperature (ATF) sender -G93.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	2	Selector lever position	Stationary Selector lever in gear: P	P	- Check multifunction switch -F125 => display zone 2 Check wiring and components => Electrical test as of Page 77 Check correspondence with display in dash panel insert



(cont.) ▼			R	R	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable
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Note on selector lever adjustment:

The gear engaged via the selector lever is determined by the multifunction switch -F125.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	2	Selector lever position	Stationary Selector lever in gear: N	N	- Check multifunction switch -F125 => display zone 2 Check wiring and components => Electrical test as of Page 77 Check correspondence with display in dash panel insert
(cont.) ▼			D	D	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	2	Selector lever position	Stationary Selector lever in gear: 3	3	- Check multifunction switch -F125 => display zone 3 Check wiring and components => Electrical test as of Page 77 Check correspondence with display in dash panel insert

(cont.) ▼			2	2	- If necessary, Adjust selector lever cable => Automatic gearbox 01K front-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable
			1	1	=> Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	3	Multi-function switch -F125	Stationary Selector lever position	2 3 4 1)	- Check wiring and components => Electrical test as of Page 77
			P	1 0 0	- Check selector lever position Check correspondence with display in dash panel insert
(cont.) ▼			R	1 1 0	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable

1) Connector contacts of multifunction switch -F125. Contact assignment => Fig., Page 106 .

Note on multifunction switch -F125:

The input signals from the multi-function switch -F125 can be tested via the gearbox control unit.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	3	Multi-function switch F425	Stationary Selector lever position	2 3 4 1)	- Check wiring and components => Electrical test as of Page 77



(cont.) ▼			N	0 1 0	- Check correspondence with display in dash panel insert Check selector lever position
			D	0 1 1	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable

Display group no.	Display zone	Designation	Test conditions		Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	3	Multi-function switch -F125	Stationary	Selector lever position 3	1 1 1	- Check wiring and components => Electrical test as of Page 77 Check selector lever position Check correspondence with display in dash panel insert
				2	1 0 1	- If necessary, Adjust selector lever cable => Automatic gearbox 01F four-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable
				1	0 0 1	-> Automatic gearbox 01K front-wheel drive. ; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable
(cont.) ▼			in event of fault		0 0 0	- => Fault table as of Page 25, fault code 00293

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Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
004	4	Torque reduction	during driving is switched on (output low)	Torque reduction	- => Fault table as of Page 25, fault code 00545

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
			is switched off (output high)	-	- Check wiring according to current flow diagram, contact assignment => Electrical test as of Page 77

Notes on torque reduction:

Torque reduction (retardation of engine timing or reduction of injection quantity) is only activated during gear changing. Depending on the driving situation, engine torque reduction may only be active for a very brief period, i.e. as the data transmission to the V.A.G 1551 is relatively slow, the unit may not register short-term torque reduction under certain circumstances.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
005	1	Solenoid valve 1 - N88	during driving		- => Fault table as of Page 25 , fault code 00258
			-N88 active. inactive	M1 M	
	2	Solenoid valve 2 - N89	during driving		- Carry out electrical test => as of Page 77
			-N89 active inactive	M2 M	
	3	Solenoid valve 3 - N90	during driving		▪ Data on incorrectly actuated solenoid valves is stored in the fault memory
			-N90 active. inactive	M3 M	
	4	Selected gear	=> Display group number 001, display zone 4		

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
006	1	Kickdown switch -F8	Kickdown actuated	Kickdown	- Check kickdown switch -F8 => Electrical test as of Page 77
			not actuated	-	
	2	Accelerator pedal value	=> Display group number 002, display zone 2		
	3	Throttle valve duty cycle	Stationary Idling	approx. 12% 1)	▪ When accelerating from idling to full throttle the % value is continually increased - Carry out electrical test => as of Page 25, fault codes 00518 and 00638
			Full throttle	...approx. 85% 1)	



Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
	4	Overrun/traction signal	during driving 1	Overrun	▪ When driving downhill or deceleration (engine brake)
			Traction operation	-	▪ During normal driving operation, engine provides power

1) Specified values are only reference values.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
007	1	Engine torque	during driving	... Nm	▪ The gearbox control unit calculates the engine torque from the fuel consumption and engine speed signals
	2	Engine speed	=> Display group number 001, display zone 1		
	3	Accelerator pedal value	=> Display group number 002, display zone 2		
	4	Fuel consumption signal 1)	during driving	0.00 ... 10.00 ms 2)	- Carry out electrical test => as of Page 25, fault code 00549

1) Signal corresponds to opening time of injectors in milliseconds.

2) Specified values are only reference values. Displayed values should increase or decrease analogously to the engine load.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
008	1	Torque increase in converter	during driving	1 ... 2.6 1)	▪ Calculated by gearbox control unit from engine speed, engaged gear and gearbox output speed
	2	Engine speed	=> Display group number 001, display zone 1		
	3	Selected gear	=> Display group number 001, display zone 4		
	4	Traction control system	during driving	ASR activated	▪ The TCS control unit prevents a gear change if necessary
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1) Specified values are only reference values. Displayed values are dependent upon the respective torque converter.

Notes on torque increase in converter:

The resultant engine torque from the speed difference between pump gear and turbine gear in the torque converter is increased by this value.

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 nominal value	Action in the event of deviation from specified value
009	1	Selector lever position	=> Display group number 004, display zone 2		
	2	Road speed	=> Display group number 003, display zone 3		
	3	Cruise Control System (CCS)	during driving	Power supply connected	▪ The CCS is supplied with power after switching on the ignition and reaching a speed of over 30 km/h.
				Power supply not connected	
	4	Air conditioner kick-down	during driving	activated	▪ Change down is only activated if necessary with kickdown
				not activated	

Display group no.	Display zone	Designation	Test conditions	Display at V.A.G 1551 specification	Action in the event of deviation from specification
010	1	Wheel speed Front left	during driving	...rpm (min.: 0 rpm)	▪ The speeds must increase or decrease evenly and analogously to the road speed - Test wiring connections, carry out electrical test => Page 77 - => Fault table from Page 25 , fault codes 00283, 00285, 00287 and 00290
	2	Wheel speed Front right			
	3	Wheel speed Rear right			
	4	Wheel speed Rear left			
011	Currently not applicable				

Note on wheel speed:

For gearbox 01K, the gearbox speed from gearbox speed sender -G38 is displayed in this display group number.

4 - Electrical test, general

4.1 - Electrical test, general

- ◆ Electrical test for vehicles with 55-pin control unit (ä approx. 08.95) => from Page 78.
- ◆ Electrical test for vehicles with 88-pin control unit (MY 96 ä; gradual introduction) => from Page 102.
- Only carry out the relevant test steps for each component or wiring connections (targeted approach).
- Carry out all the steps listed in the column "Fault remedy if readout does not match specification".

Note:

- ◆ Testing is to be carried out with the hand-held multimeter V.A.G 1526 A and test leads from V.A.G 1594.
- ◆ The specifications given apply to an ambient temperature of 0 ... 40 °C.
- ◆ If the measured values deviate from the specifications, find fault according to current flow diagram.

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

- ♦ If the measured values deviate only slightly from the specifications, clean sockets and connectors of the control units and test leads and repeat test. Before the relevant components are replaced test lines and connections and repeat the resistance measures at the component when the specifications are below 10 Ω .
- ♦ The contact numbers of the connector and the socket numbers of the test box V.A.G 1598 A or of the adapter V.A.G 1598/20 are identical.
- ♦ If a connector has been disconnected when the ignition is switched on, a fault may have been stored in the gearbox control unit. When the test has been completed and the connectors connected: Erase the fault memory => Page 46 .

Warning

In order to avoid destroying the electronic components the corresponding measuring range must be switched on at the measuring unit before connecting the test leads.

Test requirements:

- Battery voltage OK.
- Fuses in fuse carrier OK
- Earth connections for gearbox and gearbox control unit okay.

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5 - Electrical test for vehicles with 55-pin control unit (ä approx. 08.95)

5.1 - Electrical test for vehicles with 55-pin control unit (ä approx. 08.95)

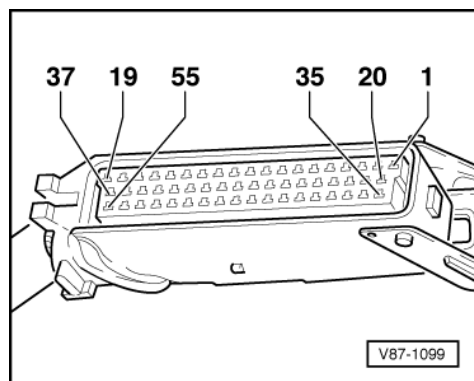
Observe general notes and test requirements =>Page 77 .

Note:

- ♦ Test box V.A.G 1598 A must not be connected when performing diagnosis with fault reader V.A.G 1551.
- ♦ Wait for 30 seconds after the ignition has been switched off before unplugging the connector for automatic gearbox control unit -J217.
- ♦ By unplugging the connector for the automatic gearbox control unit -J217, the permanent positive supply will be cut off, thus the permanent memory will be erased.

5.2 - Connecting test box V.A.G 1598 A

- Switch off ignition.
- Remove control unit for automatic gearbox -J217 =>Page 17 .
- Disconnect connector from control unit for automatic gearbox -J217 =>Page 19 .



- Connect test box V.A.G 1598 A to gearbox wiring harness connector and to control unit for automatic gearbox -J217 with adapter cable V.A.G 1598/5.

Note:

-> The pin assignment of the control unit for automatic gearbox -J217 is identical to the pin assignment (sockets) of the test box.

Test requirements:

- Measuring resistance:
Adapter V.A.G 1598/5 removed from gearbox control unit
- Measuring voltage:
Adapter V.A.G 1598/5 connected to gearbox control unit.

5.3 - Test table for vehicles with 55-pin control unit (ä approx. 08.95)

Contact assignment for 55-pin control unit, 55-pin connector and sockets on V.A.G 1598 A.

1 - Supply voltage (terminal 15)	10 - Not allocated
2 - Gearbox speed sender -G381)	11 - Front left wheel speed signal from -G47 2)
3 - Engine speed signal	12 - Rear right wheel speed signal from -G46 2)
4 - Selector lever lock solenoid -N110 and selector lever lock control unit -J221	13 - A/C shut-off when kickdown is activated.
5 - Solenoid valve 1 -N88	14 - Multi-function switch -F125
6 - Solenoid valve 4 -N91 (pressure control valve)	15 - Not allocated
7 - earth	16 - Illumination for program switch -E122 3)
8 - Not allocated	17 - Supply voltage (only for cruise control system)
9 - Not allocated	18 - Not allocated
Continued ▼	

- 1) Only for gearbox 01K.
- 2) Only for gearbox 01F.
- 3) Only for 2.8 l - 128 kW with gearbox 01F ä approx. 09.92.

19 - Supply voltage for solenoid valves	30 - Front right wheel speed signal from -G45 2)
20 - Gearbox speed sender (screening) -G381)	31 - Selection range display -Y5
21 - Fuel consumption signal	32 - Ignition timing/injection quantity retardation
22 - not allocated	33 - Multi-function switch -F125
23 - Not allocated	34 - Not allocated
24 - Solenoid valve 2 -N89	35 - Not allocated
25 - Not allocated	36 - Not allocated
26 - Not allocated	37 - Not allocated
27 - Not allocated	38 - Gearbox speed sender -G381)
28 - Not allocated	39 - Supply voltage (Terminal 30)
29 - Program switch -E122 3)	40 - Input signal from control unit for ABS (EDL) 1)



Continued ▼

- 1) Only for gearbox 01K.
- 2) Only for gearbox 01F.
- 3) Only for 2.8 l - 128 kW with gearbox 01F ä approx. 09.92.

41 - Kickdown signal	49 - Not allocated
42 - Solenoid valve 3 -N90	50 - Multi-function switch -F125
43 - Not allocated	51 - K-wire for diagnosis
44 - Sender for gearbox oil temperature -G93 (ATF)	52 - Not allocated
45 - Not allocated	53 - Not allocated
46 - Sender for gearbox oil temperature -G93 (ATF)	54 - Output signal for cruise control system
47 - Accelerator pedal value from engine control unit	55 - Not allocated
48 - Rear left wheel speed signal from -G44 2)	

- 1) Only for gearbox 01K.
- 2) Only for gearbox 01F.

Overview of test steps

Only carry out test steps listed according to component in the fault table and the measured value block.

Component to be tested	Test steps to be performed	Component to be tested	Test steps to be performed
Supply voltage from control unit -J217	▪ Test steps 1, 2, 3	Programme switch -E122	▪ Test step 23
Selector lever lock solenoid -N110	▪ Test steps 30 and 31	Warning lamp for program switch -E122	▪ Test step 24
Brake light switch -F	▪ Test step 7	Selection range display -Y5	▪ Test step 25
Multi-function switch -F125	▪ Test step 4, 5, 6	Engine speed	▪ Test steps 28, 29
Solenoid valve 1 -N88	▪ Test step 17	Kickdown switch -F8	▪ Test steps 9, 32
Solenoid valve 2 -N89	▪ Test step 18	Gearbox speed sender -G38	▪ Test step 11
Solenoid valve 3 -N90	▪ Test step 19	Speed sensor -G44 ... -G47	▪ Test steps 12, 13, 14, 15
Solenoid valve 4 -N91	▪ Test steps 20, 21	Sender for gearbox oil temperature -G93 (ATF)	▪ Test step 10
Fuel consumption signal	▪ Test step 27	Engine/gearbox electrical connection	▪ Test step 22
Cruise control system (CCS)	▪ Test step 8	Input signal for accelerator pedal value (throttle valve)	▪ Test step 26
Input signal from control unit for ABS (EDL)	▪ Test step 16		

Test steps, Part I

General notes and test requirements => Page 77.

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
1	1 + 7	Voltage measurement (terminal 15)	▪ Control unit -J217 disconnected ▪ Ignition switched on	approx. battery voltage	- Perform test step 3 Test wiring connections according to current flow diagram
2	39 + 7	Supply voltage (terminal 30)	▪ Control unit -J217 disconnected ▪ Battery voltage OK.	approx. battery voltage	- Perform test step 3 Test wiring connections according to current flow diagram
Switch on measuring range: Resistance measurement					
3	7 + earth	Earth connection	▪ Control unit -J217 disconnected ▪ Ignition switched off	≤1.5Ω	- Test wiring according to current flow diagram.

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
4	7 + 50	Multi-function switch -F125	▪ Control unit -J217 disconnected ▪ Ignition switched on Selector lever in P, R, 3, 2	approx. battery voltage	- One value <1 V is always measured: Perform test step 5 Test wiring to multi-function switch => Page 127 If the measured values do not correspond to the selector lever position:
(cont.) ▼			- Selector lever in N, D, 1	< 1 V	- Adjust selector lever cable => Automatic gearbox 01F, four-wheel drive; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable Perform test step 6

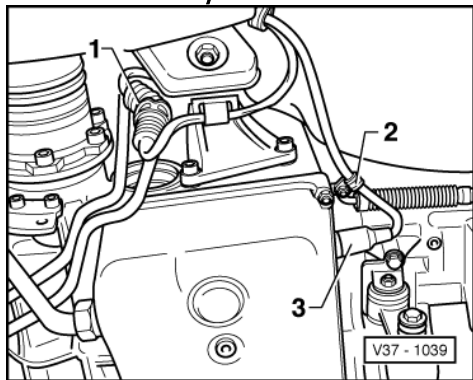
Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
4	7 + 14	Multi-function switch -F125	▪ Control unit -J217 disconnected ▪ Ignition switched on Selector lever in R, N, D, 3	approx. battery voltage	- One value <1 V is always measured: Perform test step 5 Test wiring to multi-function switch => Page 127 If the measured values do not correspond to the selector lever position:



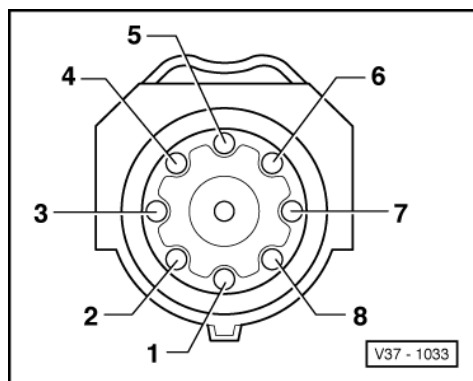
Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
			- Selector lever in P, 2, 1	< 1 V	- Adjust selector lever cable => Automatic gearbox 01F, four-wheel drive; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable
	7 + 33		- Selector lever in D, 3, 2, 1	approx. battery voltage	=> Automatic gearbox 01K front-wheel drive; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable
			- Selector lever in P, R, N	< 1 V	- Perform test step 6
Switch on measuring range: Voltage measurement					
Test step	Plug contact 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
5	1 + 6	Voltage supply to multi-function switch -F125	▪ Ignition switched on	approx. battery voltage	- Test wiring using current flow diagram
	1 + 8				

1) Contacts on the disconnected connector of the multi-function switch -F125. Disconnecting connector from the multi-function switch and contact assignment => Fig. on Page 82 .

Notes on test step 5:



- -> Remove spring bracket lock of connector -1- for multi-function switch.



- -> Contact assignment on 8-pin connector of multi-function switch -F125.
- Use test leads from V.A.G 1594 for the measurement.

Switch on measuring range: Resistance measurement					
Test step	Contacts on -F125 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
6 (cont.) ▼	1 + 7 4 + 5 3 + 6 2 + 8	Multi-function switch -F125	▪ Ignition switched off Selector lever in P, R, N, D, 3, 2, 1	$\infty \omega$	- Test connector of multi-function switch for contact corrosion, moisture or loose fit. Replace multi-function switch - F125
	1 + 2		- Selector lever in P, R, 3, 2	$\leq 10 \omega$	=> Automatic gearbox 01F, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch - F125.
			- Selector lever in N, D, 1	$\infty \omega$	=> Automatic gearbox 01K, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch - F125

1) Contacts on the plug connector of the multi-function switch -F125. Disconnecting connector from the multi-function switch and contact assignment =>Page 85 .

Switch on measuring range: Resistance measurement					
Test step	Contacts on -F125 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
6	1 + 3	Multi-function switch -F125	▪ Ignition switched off Selector lever in R, N, D, 3	$\leq 10 \omega$	- Test connector of multi-function switch for contact corrosion, moisture or loose fit.
			- Selector lever in P, 2, 1	$\infty \omega$	- Replace multi-function switch - F125
	1 + 4		- Selector lever in D, 3, 2, 1	$\leq 10 \omega$	=> Automatic gearbox 01F, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125.



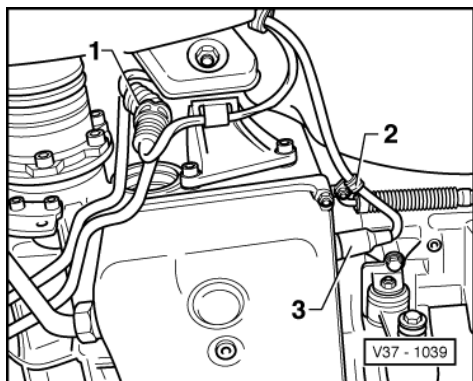
Switch on measuring range: Resistance measurement					
Test step	Contacts on -F125 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
(cont.) ▼			- Selector lever in P, R, N	$\infty \omega$	=> Automatic gearbox 01K, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125

1) Contacts on the plug connector of the multi-function switch -F125. Disconnecting connector from the multi-function switch and contact assignment =>Page 85 .

Switch on measuring range: Resistance measurement 2 M ω)					
Test step	Contacts on -F125 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
6	7 + 8	Multi-function switch -F125 (reverse lights)	▪ Ignition switched off Selector lever in R	$\leq 10 \omega$	- Test connector of multi-function switch for contact corrosion, moisture or loose fit.
			- Selector lever in P, N, D, 3, 2, 1	$\infty \omega$	- Replace multi-function switch - F125
	6 + 5	P/N-signal of multi-function switch	- Selector lever in P, N	$\leq 10 \omega$	=> Automatic gearbox 01F, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch - F125.
			- Selector lever in R, D, 3, 2, 1	$\infty \omega$	=> Automatic gearbox 01K front-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125

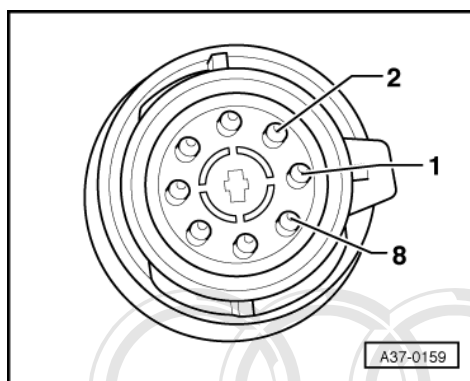
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1) Contacts on the plug connector of the multi-function switch -F125. Disconnecting connector from the multi-function switch and contact assignment =>Page 85 .



Notes on test step 6:

- -> Remove spring bracket lock of connector -1- for multifunction switch.



- -> Contact assignment on the plug connector of the multi-function switch -F125.

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
7	4 + 7	Brake light switch -F	▪ Control unit -J217 disconnected Brake pedal not pressed Press brake pedal	< 1 V approx. battery voltage	- Test wiring using current flow diagram - Replace brake light switch => Running gear, four-wheel drive; Repair Group 46; Servicing pedal assembly Servicing pedal assembly
8 (cont.) ▼	17 + 7	Voltage supply to -J217 for cruise control system	▪ Control unit -J217 connected ▪ Ignition switched on	approx. battery voltage	- Supply voltage for cruise control system is provided via gearbox control unit Test wiring using current flow diagram

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
8	xx 1) + 7	Actuation of cruise control system (CCS):	▪ Final control diagnosis initiated and CCS relay actuated =>Page 43 .	Diode test lamp flashes	- Test wiring using current flow diagram Perform "Output signal for cruise control system (CCS)" test



Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
	xx 1) + 7	Output signal for cruise control system (CCS)	▪ After switching on the ignition, a speed of over 30 km/h was reached Selector lever in D, 3, 2	approx. battery voltage	- Test wiring using current flow diagram If no defect is found in the wiring in the test, replace gearbox control unit if necessary => Page 17

1) Contacts on the control unit for cruise control system -J213

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Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
9	7 + 41	Kickdown signal for petrol engine	▪ Ignition switched off ▪ Control unit -J217 disconnected Accelerator pedal not depressed	$\infty \Omega$	- Test wiring according to current flow diagram. Adjust or replace throttle cable => 5-cyl. injection engine (4-valve, turbo), Mechanical components; Repair Group 20; Servicing throttle actuation; Adjusting throttle cable Servicing throttle actuation; Adjusting throttle cable

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
(cont.) ▼			- Depress gas pedal until kick-down	$\leq 1.5 \Omega$	=> 6-cyl. injection engine (2.6 l engine, 2-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable => 6-cyl. injection engine (2-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable Removing and installing parts of fuel system; Adjusting throttle cable

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Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
9	7 + 41	Kickdown signal for TDI engine	▪ Ignition switched on Accelerator pedal not depressed	approx. battery voltage	- Test wiring according to current flow diagram.
			- Depress gas pedal until kickdown	$\leq 3 \text{ V}$	- Servicing accelerator mechanism => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair Group 23; Repairing diesel direct injection system; Repairing accelerator mechanism Repairing diesel direct injection system; Repairing accelerator mechanism



Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
10	46 + 44	Gearbox oil temperature sender - G93	▪ Control unit -J217 disconnected ▪ Ignition switched off	0,5 ... 3 k Ω	- Test wiring using current flow diagram Replace gearbox wiring harness
	46 + 7 44 + 7			$\infty \Omega$	
11 1)	2 + 38	Gearbox speed sender -G38	▪ Control unit -J217 disconnected ▪ Ignition switched off	approx. 1 k Ω	- Test wiring using current flow diagram Replace gearbox speed sender - G38 => Automatic gearbox 01K, front-wheel drive; Repair group 38; Removing and installing gearbox speed sender
	38 + 20 2 + 20 2 + 32			$\infty \Omega$	

1) Only for gearbox 01K.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
12 2)	7 + 11	Speed sensor front left -G47	▪ Control unit -J217 disconnected ▪ Ignition switched off	$\infty \Omega$	- The wiring connections for the anti-lock brake system -J104 are tested - Test wiring according to current flow diagram.
	xx1) + 11			$\leq 1.5 \Omega$	
13 2)	7 + 30	Speed sensor	▪ Control unit -J217 disconnected ▪ Ignition switched off	$\infty \Omega$	
	xx1) + 30	Front right -G45		$\leq 1.5 \Omega$	
14 2)	7 + 48	Speed sensor		$\infty \Omega$	
	xx1) + 48	Rear left -G44		$\leq 1.5 \Omega$	
15 2)	7 + 12	Speed sensor		$\infty \Omega$	
	xx1) + 12	Rear right -G46		$\leq 1.5 \Omega$	
16 3)	7 + 12	Input signal from control unit for		$\infty \Omega$	
	xx1) + 12	ABS (EDL)		$\leq 1.5 \Omega$	

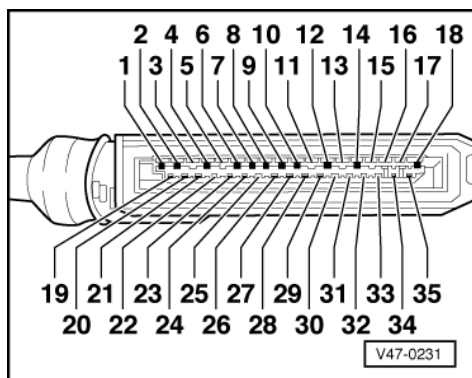
1) Contact on disconnected control unit connector for anti-lock brake system -J104 => Page 89 .

2) Only for gearbox 01F.

3) Only for gearbox 01K.

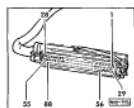
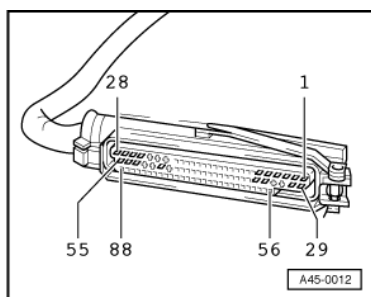
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Notes on test steps 12, 13, 14, 15, 16:



- ◆ -> Contact assignment on 35-pin connector of ABS-control unit ▶ 05.95.
- ◆ Location: On left under rear seat.

35-pin connector contact		Test box V.A.G 1598 A
ä 06.92	07.92 ä	socket
17	5	11
31	6	12
23	23	30
30	7	48



- ◆ -> Contact assignment on 88-pin connector of ABS-control unit 06.95 ▶.
- ◆ Location: On left under rear seat.

- Connect adapter V.A.G 1598/20

=> Running gear, Four-wheel drive; Repair Group 01; Self-diagnosis Electrical Test Self-diagnosis Electrical Test

- ◆ The contact numbers of the connector and the socket numbers of the adapter V.A.G 1598/20 are identical.
- ◆ Contacts for wiring connections of gearbox control unit

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Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
17	5 + 19	Solenoid valve 1 -N88	▪ Control unit -J217 disconnected ▪ Ignition switched off	30 ... 40 ω	- Testing wiring between 8-pin connector gear-box control unit => Page 128
	5 + 1 5 + 7			$\infty\omega$	- Testing wiring harness in gear-box => Page 128
18	24 + 19	Solenoid valve 2 -N89	▪ Control unit -J217 disconnected ▪ Ignition switched off	30 ... 40 ω	- Test wiring between 8-pin connector and gear-box control unit => Page 128
	24 + 1 24 + 7			$\infty\omega$	- Testing wiring harness in gear-box => Page 128

Note for testing solenoid valves:

If the specifications are not attained, but the solenoid valves do not react in the final control diagnosis, test the actuation of the solenoid valves => Page 125. If this test does not reveal any fault affecting the activation of the valve, replace the relevant solenoid valve or the valve body.

=> Automatic gearbox 01K front-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
19	42 + 19	Solenoid valve 3 -N90	▪ Control unit -J217 disconnected ▪ Ignition switched off	30 ... 40 ω	- Test wiring between 8-pin connector and gear-box control unit => Page 128
	42 + 1 42 + 7			$\infty\omega$	- Testing wiring harness in gear-box => Page 128

Note for testing solenoid valves:

If the specifications are not attained, but the solenoid valves do not react in the final control diagnosis, test the actuation of the solenoid valves => Page 125. If this test does not reveal any fault affecting the activation of the valve, replace the relevant solenoid valve or the valve body.

=> Automatic gearbox 01K front-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
20	6 + 19	Solenoid valve actuation 4 -N91	▪ Control unit -J217 connected ▪ Ignition switched on ▪ Diode test lamp V.A.G 1527 A connected to sockets ▪ Final control diagnosis performed and solenoid valve 4 => from Page 43 .	Diode test lamp flashes	- Perform test step 21

5.4 - Part II

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
21	6 + 19	Solenoid valve 4 -N91	▪ Control unit -J217 disconnected ▪ Ignition switched off	5 ... 8 ω	- Test wiring between 8-pin connector and gearbox control unit => Page 128
	6 + 1 6 + 7			$\infty \omega$	- Testing wiring harness in gearbox => Page 128

Notes for testing solenoid valves:

If the specifications are not attained, but the solenoid valves do not react in the final control diagnosis, test the actuation of the solenoid valves => Page 125 . If this test does not reveal any fault affecting the activation of the valve, replace the relevant solenoid valve or the valve body.

=> Automatic gearbox 01K front-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
22	32 + xx 1)	Engine/gearbox electrical connection	▪ Control unit -J217 disconnected ▪ Ignition switched off ▪ Engine control unit disconnected	$\leq 1.5 \omega$	- Test wiring using current flow diagram
	32 + 1 32 + 7			$\infty \omega$	
23	1 + 29	Programme switch -E122	▪ Control unit -J217 disconnected ▪ Ignition switched on ▪ Diode test lamp V.A.G 1527 A connected to sockets - Program switch not actuated (Economy)	Diode test lamp should not illuminate	- Test wiring using current flow diagram

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Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
			- Program switch actuated (Sport)	Diode test lamp should illuminate	

1) Corresponding contact assignment on connector of engine control unit

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Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
24	1 + 16	Warning lamp for program switch -E122	▪ Control unit -J217 connected ▪ Programme switch -E122 OK ▪ Ignition switched on ▪ Diode test lamp V.A.G 1527 A connected to sockets ▪ Program switch actuated (Sport)	Diode test lamp must illuminate	- Test wiring using current flow diagram

Note on testing the program switch warning lamp -E122:

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Only perform the test if the program switch warning lamp (green) does not illuminate when the sport program is selected.

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
25	1 + 31	Selection range display -Y5	▪ Control unit -J217 connected ▪ Replace multi-function switch -F125 OK ▪ Ignition switched on ▪ Diode test lamp V.A.G 1527 A connected to sockets	Diode test lamp should illuminate	- Test wiring using current flow diagram Rectify fault in dash panel insert => Electrical System; Repair Group 90; Repair dash panel insert Repair dash panel insert

Note for testing the selection range display -Y5:

Only perform the test if the selector lever position is not indicated on the selector range display.

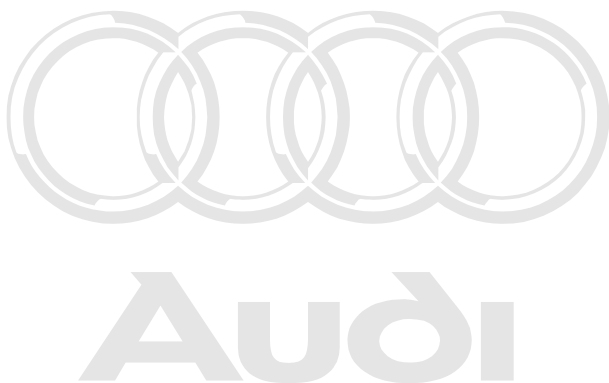
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification

26	47 + 7	Input signal for accelerator pedal value (throttle valve)	▪ Ignition switched on ▪ Fault memory of engine control unit interrogated ▪ Diode test lamp V.A.G 1527 A connected to sockets Press accelerator pedal	The diode test lamp must illuminate slightly and become brighter on pressing the accelerator pedal.	- Test wiring according to current flow diagram. Test throttle valve potentiometer or accelerator pedal position sender => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing control unit input values; Testing accelerator pedal position sender -G79 Testing control unit input values; Testing accelerator pedal position sender -G79 => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing output signal for throttle valve position
(cont.) ▼					

Note on testing the output signal for accelerator pedal value:

If no deviations from the specification are found in this test, but the self-diagnosis and measured value block indicate faults in the signal, the gearbox control unit must be replaced => Page 17.

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
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26	47 + 7	Input signal for accelerator pedal value (throttle valve)	▪ Ignition switched on ▪ Fault memory of engine control unit interrogated ▪ Diode test lamp V.A.G 1527 A connected to sockets Press accelerator pedal	The diode test lamp must illuminate slightly and become brighter on pressing the accelerator pedal.	- Test throttle valve potentiometer or accelerator pedal position sender => MPFI injection and ignition system (6-cylinder); Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position => MPFI injection and ignition system (6-cylinder); ä 05.94; Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position => MPI injection and ignition system (6-cyl.) 06.94 ä; Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position
(cont.) ▼					

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
			Or:		

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26	47 + 7	Input signal for accelerator pedal value (throttle valve)	- V.A.G 1767 connected to earth (socket 7) with test leads from V.A.G 1594 A and to socket 47 with green connector Accelerator pedal not depressed	Duty cycle approx. 13.0 %	- Test wiring according to current flow diagram. Test throttle valve potentiometer or accelerator pedal position sender => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing control unit input values; Testing accelerator pedal position sender - G79 Testing control unit input values; Testing accelerator pedal position sender - G79 => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing output signal for throttle valve position
(cont.) ▼					

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
26	47 + 7	Input signal for accelerator pedal value (throttle valve)	- V.A.G 1767 connected to earth (socket 7) with test leads from V.A.G 1594 A and to socket 47 with green connector Press down accelerator pedal until full throttle	Duty cycle approx. 83.0 %	- Test throttle valve potentiometer or accelerator pedal position sender => MPFI injection and ignition system (6-cylinder); Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position

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Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
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27 (cont.) ▼	21 + 7	Fuel consumption signal	▪ Fault memory of engine control unit interrogated ▪ Engine running at idling speed ▪ Diode test lamp V.A.G 1527 A connected to sockets - Press accelerator pedal	Diode test lamp must flash faintly and slowly and then become brighter and faster as the speed increases.	- If deviations from the specification are found, connect display unit to computer -J128 and repeat the test. If no deviations from the specification are found without -J128, test -J128 and replace if necessary. - Testing actuation of the vehicle computer => Diesel direct injection and glow plug system (TDI 5-cyl.), Repair group 23; Testing auxiliary signals; Testing actuation of vehicle computer (fuel consumption display)
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Note on testing the fuel consumption signal:

If no deviations from the specification are found in this test, but the self-diagnosis and measured value block indicate faults in the signal, the automatic gearbox control unit must be replaced => Page 17.

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
27 (cont.) ▼	21 + 7	Fuel consumption signal	▪ Fault memory of engine control unit interrogated ▪ Engine running at idling speed ▪ Diode test lamp V.A.G 1527 A connected to sockets - Press accelerator pedal	Diode test lamp must flash faintly and slowly and then become brighter and faster as the speed increases.	- Testing actuation of the vehicle computer => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing actuation of vehicle computer for fuel consumption display - Repairing Multi-Point Fuel Injection system; Testing actuation of vehicle computer (fuel consumption display)

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Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
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27	21 + 7	Fuel consumption signal	▪ Fault memory of engine control unit interrogated ▪ Engine running at idling speed ▪ Diode test lamp V.A.G 1527 A connected to sockets Press accelerator pedal	Diode test lamp must flash faintly and slowly and then become brighter and faster as the speed increases.	- Testing actuation of the vehicle computer => MPFI injection and ignition system (6-cylinder); å 05.94; Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position Repairing Multi-Point Injection system; Testing actuation of vehicle computer (fuel consumption display) - Test wiring according to current flow diagram.
(cont.) ▼					

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
27	21 + 7	Fuel consumption signal	Or: ▪ V.A.G 1767 connected to earth (socket 7) with test leads from V.A.G 1594 A and to socket 21 with green connector Accelerator pedal not depressed	Duty cycle approx. 1.0 %	- If deviations from the specification are found, connect display unit to computer -J128 and repeat the test. If no deviations from the specification are found without -J128, test -J128 and replace if necessary. - Testing actuation of the vehicle computer => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing auxiliary signals; Testing actuation of vehicle computer (fuel consumption display) Testing auxiliary signals; Testing actuation of vehicle computer (fuel consumption display)
(cont.) ▼					

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Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
27 (cont.) ▼	21 + 7	Fuel consumption signal	▪ V.A.G 1767 connected to earth (socket 7) with test leads from V.A.G 1594 A and to socket 21 with green connector Press down accelerator pedal until full throttle	Duty cycle approx. 23.0 %	- Testing actuation of the vehicle computer => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing actuation of vehicle computer for fuel consumption display Repairing Multi-Point Fuel Injection system; Testing actuation of vehicle computer (fuel consumption display)

Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
27	21 + 7	Fuel consumption signal	▪ V.A.G 1767 connected to earth (socket 7) with test leads from V.A.G 1594 A and to socket 21 with green connector Press down accelerator pedal until full throttle	Duty cycle approx. 23.0 %	- Testing actuation of the vehicle computer => MPI injection and ignition system (6-cyl.) à 05.94; Repair Group 24; Repairing Multi-Point Injection system; Testing actuation of vehicle computer (fuel consumption display) Repairing Multi-Point Injection system; Testing actuation of vehicle computer (fuel consumption display) - Test wiring according to current flow diagram.

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Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
28		Engine speed input signal	▪ Fault memory of engine control unit interrogated ▪ Selector lever in position P or N ▪ Engine running at idling speed - Press accelerator pedal	The speed is displayed on the rev counter according to the engine speed	- Test wiring using current flow diagram - Remove connector from gearbox control unit and repeat test - If the engine speed is now displayed on the rev counter, replace gearbox control unit - If the engine speed is not displayed, continue from test step 29

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
29	3 + xx 1)	Wiring between gearbox control unit and engine control unit for engine speed input signal	▪ Ignition switched off ▪ Connector for engine control unit, gearbox control unit, rev counter and if necessary, additional components removed according to current flow diagram ▪ Adapter cable V.A.G 1598/5 only connected to wiring harness for gearbox control unit	$\leq 1.5 \omega$	- Test wiring according to current flow diagram. - If no deviations from the specification are found in the test: - Test actuation of rev counter => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing auxiliary signals; - Testing actuation of rev counter - Testing auxiliary signals; Testing actuation of rev counter => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing actuation of rev counter
(cont.) ▼					

1) Corresponding contact assignment on connector of engine control unit

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder



Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
29	3 + 7	Wiring between gearbox control unit and engine control unit for engine speed input signal	▪ Ignition switched off ▪ Connector for engine control unit, gearbox control unit, rev counter and if necessary, additional components removed according to current flow diagram ▪ Adapter cable V.A.G 1598/5 only connected to wiring harness for gearbox control unit	$\infty \Omega$	- Test actuation of rev counter => MPFI injection and ignition system (6-cylinder); Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing actuation of rev counter Repairing Multi-Point Fuel Injection system; Testing actuation of rev counter

Switch on measuring range: Voltage measurement					
Test step	Contacts on connector of - J221 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
30 (cont.) ▼	4 + 6	Voltage supply for selector lever lock control unit - J221	▪ Control unit -J217 disconnected ▪ Selector lever lock control unit -J221 disconnected	approx. battery voltage	- Test wiring using current flow diagram
			Ignition switched on		
	4 + 3 2)	Voltage supply on actuation of brake light switch -F	- Ignition switched off	< 1 V	- Test wiring using current flow diagram
			Brake pedal pressed	approx. battery voltage	
			- Brake pedal not pressed	< 1 V	

1) Contact assignment on control unit connector for selector lever lock -J221 => Page 101 .

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2) The prerequisite is that both brake lights are OK.

Switch on measuring range: Voltage measurement					
Test step	Contacts on connector of - J221 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
30	6 + 2	Function of P/N switch on multi-function switch - F125	▪ Ignition switched on Selector lever in P, N	approx. battery voltage	- Test wiring using current flow diagram

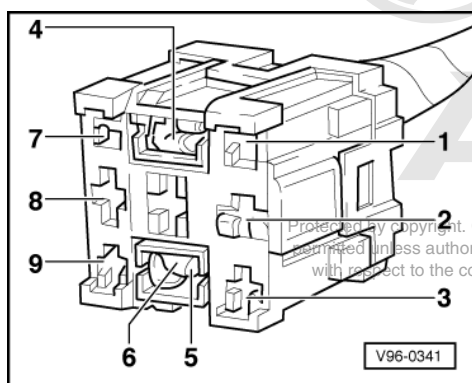
Switch on measuring range: Voltage measurement					
Test step	Contacts on connector of - J221 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
			- Selector lever in R, D, 3, 2, 1	< 1 V	- If necessary, disconnect relay for starter inhibitor and reversing light -J226 and repeat measurement.

1) Contact assignment on control unit connector for selector lever lock -J221 => Page 101 .

Test step	Contacts on connector of - J221 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
31	8 + 3	Selector lever lock solenoid - N110	▪ Selector lever lock control unit -J221 disconnected	approx. 12.4 Ω	- Test wiring using current flow diagram Replace solenoid for selector lever lock -N110. => Automatic gearbox 01F, four-wheel drive; Repair Group 37; Servicing shift mechanism; Dismantling and assembling shift mechanism Servicing shift mechanism; Dismantling and assembling shift mechanism

1) Contact assignment on control unit connector for selector lever lock -J221 => Page 101 .

Notes on test steps 30 and 31:



- ♦ -> Contact assignment on the connector of the disconnected control unit for selector lever lock -J221.
- ♦ Location: Auxiliary relay carrier II

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

- ♦ If both brake light bulbs should fail, the selector lever lock will not work, i.e. the selector lever can be shifted out of P or N without the brake pedal being depressed.



Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
32	13 + 7	Auxiliary signal for air conditioner (when kick-down is activated)	▪ Control unit -J217 connected ▪ Ignition switched on ▪ Diode test lamp V.A.G 1527 A connected to sockets Final control diagnosis initiated and kickdown switch - F8 actuated => from Page 43	Diode test lamp V.A.G 1527 A must flash	- Test wiring using current flow diagram Test function of air conditioner => Heating, air conditioner; Repair group 01; Self-diagnosis; Interrogating fault memory Self-diagnosis; Interrogating fault memory

6 - Electrical test for vehicles with 88-pin control unit (MY 96 ä; gradual introduction)

6.1 - Electrical test for vehicles with 88-pin control unit (MY 96 ä; gradual introduction)

Observe general notes and test requirements =>Page 77 .

Note:

- ♦ Wait for 30 seconds after the ignition has been switched off before unplugging the connector for automatic gearbox control unit -J217.
- ♦ By unplugging the connector for the automatic gearbox control unit -J217, the permanent positive supply will be cut off, thus the permanent memory will be erased.

6.2 - Connect adapter V.A.G 1598/20

- Switch off ignition.
- Remove control unit for automatic gearbox J217 =>Page 17.
- Remove connector from gearbox control unit =>Page 19 .
- Connect adapter V.A.G 1598/20 to gearbox wiring harness connector.

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6.3 - Test table for vehicles with 88-pin control unit (MY 96 ä; gradual introduction)

Contact assignment to 88-pin control unit, to 88-pin connector and sockets on V.A.G 1598/20 A.

1 - Not allocated	11 - Not allocated
2 - Selector lever lock relay -J378	12 - Not allocated
3 - Not allocated	13 - Not allocated
4 - Not allocated	14 - Gearbox speed sender -G38 1)
5 - Solenoid valve 4 -N91 (pressure control valve)	15 - Gearbox speed sender (screening) -G38 1)
6 - Earth	16 - Not allocated
7 - Accelerator pedal value from engine control unit (throttle valve)	17 - MIL signal for engine control unit (USA only)

8 - Multi-function switch -F125	18 - Kickdown signal
9 - Not allocated	19 - Input signal from control unit for ABS (EDL) 1)
10 - Selector lever lock solenoid -N110 / brake light switch	20 - Ignition timing/injection quantity retardation
Continued ▼	

1) Only for gearbox 01K.

21 - Sender for gearbox oil temperature -G93 (ATF)	33 - Solenoid valve 2 -N89
22 - Sender for gearbox oil temperature -G93 (ATF)	34 - Not allocated
23 - Not allocated	35 - Fuel consumption signal
24 - Output signal for cruise control system	36 - Multi-function switch -F125
25 - Selection range display -Y5	37 - Multi-function switch -F125
26 - Supply voltage (terminal 30)	38 - Front left wheel speed signal from -G47 2)
27 - A/C shut-off when kickdown is activated.	39 - Front right wheel speed signal from -G45 2)
28 - Not allocated	40 - Rear left wheel speed signal from -G44 2)
29 - Not allocated	41 - Rear right wheel speed signal from -G46 2)
30 - Solenoid valve 1 -N88	42 - Gearbox speed sender -G38 1)
31 - K-wire for diagnosis	43 - Engine speed signal
32 - Solenoid valve 3 -N90	44 - Not allocated
Continued ▼	

1) Only for gearbox 01K.

2) Only for gearbox 01F.

45 - Not allocated	Contacts 56 to 88 are not allocated
46 - Not allocated	
47 - Not allocated	
48 - Not allocated	
49 - Not allocated	
50 - Supply voltage (only for cruise control system)	
51 - Not allocated	
52 - Not allocated	
53 - Supply voltage for solenoid valves	
54 - Not allocated	
55 - Supply voltage (terminal 15)	

Overview of test steps

Only carry out test steps listed according to component in the fault table and the measured value block.

Component to be tested	Test steps to be performed	Component to be tested	Test steps to be performed
Supply voltage from control unit -J217	▪ Test steps 1, 2, 3	Input signal from control unit for ABS (EDL)	▪ Test step 16
Selector lever lock solenoid -N110	▪ Test step 27	Selection range display -Y5	▪ Test step 22
Brake light switch -F	▪ Test step 7	Engine speed	▪ Test steps 25, 26
Multi-function switch -F125	▪ Test steps 4, 5, 6	Kickdown switch -F8	▪ Test steps 9 and 28



Solenoid valve 1 -N88	▪ Test step 17	Gearbox speed sender - G38	▪ Test step 11
Solenoid valve 2 -N89	▪ Test step 18	Speed sensor -G44 ... - G47	▪ Test steps 12, 13, 14, 15
Solenoid valve 3 -N90	▪ Test step 19	Sender for gearbox oil temperature -G93 (ATF)	▪ Test step 10
Solenoid valve 4 -N91	▪ Test step 20	Engine/gearbox electrical connection	▪ Test step 21
Fuel consumption signal	▪ Test step 24	Input signal for accelerator pedal value (throttle valve)	▪ Test step 23
Cruise control system (CCS)	▪ Test step 8		

Test steps

General notes and test requirements => Page **77**.

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 socket	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
1	55 + 6	Voltage measurement (terminal 15)	▪ Ignition switched on	approx. battery voltage	- Perform test step 3 Test wiring connections according to current flow diagram
2	26 + 6	Supply voltage (terminal 30)	▪ Battery voltage OK	approx. battery voltage	- Perform test step 3 Test wiring connections according to current flow diagram
Switch on measuring range: Resistance measurement					
3	6 + earth	Earth connection	▪ Ignition switched off	$\leq 1.5 \, \Omega$	- Test wiring according to current flow diagram.

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Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
4	6 + 36	Multi-function switch -F125	▪ Ignition switched on Selector lever in P, R, 3, 2	approx. battery voltage	- One value $< 1 \, \text{V}$ is always measured: Perform test step 5 Test wiring to multifunction switch=> Page 127 If the measured values do not correspond to the selector lever position:

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
(cont.) ▼			- Selector lever in N, D, 1	< 1 V	- Adjust selector lever cable => Automatic gearbox 01F, four-wheel drive; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable Perform test step 6

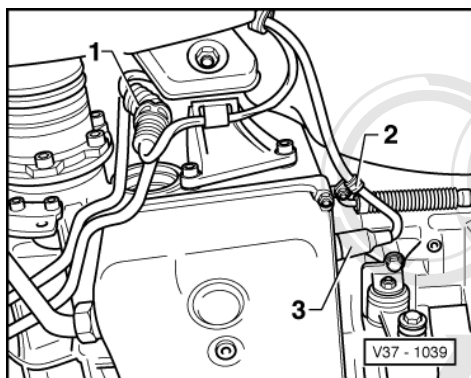
Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
4	6 + 8	Multi-function switch -F125	▪ Ignition switched on Selector lever in R, N, D, 3	approx. battery voltage	- One value <1 V is always measured: Perform test step 5 Test wiring to multifunction switch => Page 127 If the measured values do not correspond to the selector lever position:
			- Selector lever in P, 2, 1	< 1 V	- Adjust selector lever cable => Automatic gearbox 01F, four-wheel drive; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable Servicing shift mechanism; Adjusting selector lever cable
	6 + 37		- Selector lever in D, 3, 2, 1	approx. battery voltage	=> Automatic gearbox 01K, front-wheel drive; Repair Group 37; Servicing shift mechanism; Adjusting selector lever cable
			- Selector lever in P, R, N	< 1 V	- Perform test step 6

Switch on measuring range: Voltage measurement					
Test step	Plug contact 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
5	1 + 6	Voltage supply to multi-function switch -F125	▪ Ignition switched on	approx. battery voltage	- Test wiring using current flow diagram

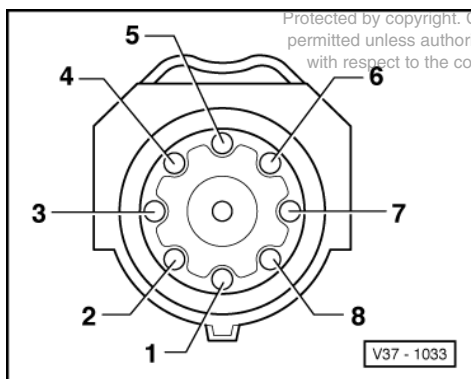
Switch on measuring range: Voltage measurement					
Test step	Plug contact 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
	8 + 6				

1) Contacts on the disconnected connector of the multifunction switch -F125. Disconnecting connector from the multifunction switch and contact assignment =>Fig. on Page 106 .

Notes on test step 5:



- -> Remove spring bracket lock of connector -1- for multifunction switch.



- -> Contact assignment on 8-pin connector of multifunction switch -F125.
- Use test leads from V.A.G 1594 for the measurement.

Switch on measuring range: Resistance measurement					
Test step	Contacts on -F125 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
6	1 +7 4 +5 3 +6 2 +8	Multi-function switch -F125	▪ Ignition switched off Selector lever in P, R, N, D, 3, 2, 1	$\infty \Omega$	- Test connector of multi-function switch for contact corrosion, moisture or loose fit. Replace multi-function switch - F125

ont.)

▼

- Selector level



ffects on the plug connector of the multi-f
switch and contact assignment =>Page

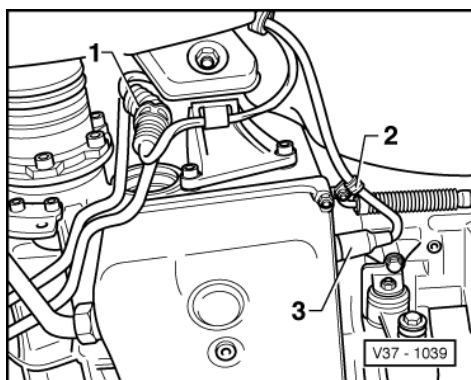
Switch on measuring range: Resist

acts on the plug connector of the multi-f
switch and contact assignment =>Page

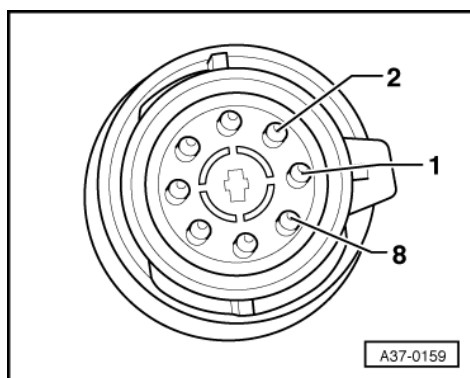
Switch on measuring range: Resistance measurement					
Test step	Contacts on -F125 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
6	7 +8	Multi-function switch -F125 (reverse lights)	▪ Ignition switched off Selector lever in R	$\leq 10 \omega$	- Test connector of multi-function switch for contact corrosion, moisture or loose fit.
			- Selector lever in P, N, D, 3, 2, 1	$\infty \omega$	- Replace multi-function switch - F125
	6 +5	P/N-signal of multi-function switch	- Selector lever in P, N	$\leq 10 \omega$	=> Automatic gearbox 01F, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch - F125.
			- Selector lever in R, D, 3, 2, 1	$\infty \omega$	=> Automatic gearbox 01K front-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125

1) Contacts on the plug connector of the multi-function switch -F125. Disconnecting connector from the multi-function switch and contact assignment => Page 108.

Notes on test step 6:



- -> Remove spring bracket lock of connector -1- for multi-function switch.



- -> Contact assignment on the plug connector of the multi-function switch -F125.

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
7	10 + 6	Brake light switch -F	- Brake pedal not pressed	< 1 V	- Test wiring using current flow diagram
			- Press brake pedal	approx. battery voltage	- Replace brake light switch => Running gear four-wheel drive; Repair Group 46; Servicing pedal assembly Servicing pedal assembly
8 (cont.) ▼	50 + 6	Voltage supply at -J217 for cruise control system	▪ Ignition switched on	approx. battery voltage	- Supply voltage for cruise control system is provided via gearbox control unit Test wiring using current flow diagram

Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
8	xx 1) + 6	Actuation of cruise control system (CCS):	▪ Control unit -J217 connected to wiring harness ▪ Final control diagnosis initiated and CCS transistor actuated => from Page 43	Diode test lamp flashes	- Test wiring using current flow diagram Perform "Output signal for cruise control system (CCS)" test

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Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
	xx 1) + 6	Output signal for cruise control system (CCS)	- Control unit -J217 connected to wiring harness - After switching on the ignition, a speed of over 30 km/h was reached - Selector lever in D, 3, 2	approx. battery voltage	- Test wiring using current flow diagram - If no defect is found in the wiring in the test, replace gearbox control unit if necessary =>

Page 17

1) Contacts on the control unit for cruise control system -J213

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
9 (cont.) ▼	6 + 18	Kickdown signal for petrol engine	- Ignition switched off - Accelerator pedal not depressed	$\infty \Omega$	- Test wiring according to current flow diagram. - Adjust or replace throttle cable => 5-cyl. injection engine (4-valve, turbo), Mechanical components; Repair Group 20; Servicing throttle actuation; Adjusting throttle cable - Removing and installing parts of fuel system; Adjusting throttle cable

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Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
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9 (cont.) ▼	6 + 18	Kickdown signal for petrol engine	▪ Ignition switched off - Depress gas pedal until kickdown	$\leq 1.5 \omega$	- Adjust or replace throttle cable => 6-cyl. injection engine (2-valve), Mechanical components; Repair Group 20; Removing and installing parts of fuel system; Adjusting throttle cable - Removing and installing parts of fuel system; Adjusting throttle cable
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Switch on measuring range: Voltage measurement					
Test step	V.A.G 1598 A sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
9	6 + 18	Kickdown signal for TDI engine	▪ Ignition switched on - Accelerator pedal not depressed	approx. battery voltage	- Test wiring according to current flow diagram.
			- Depress gas pedal until kickdown	$\leq 3 \text{ V}$	- Servicing accelerator mechanism => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair Group 23; Repairing diesel direct injection system; Repairing accelerator mechanism - Repairing diesel direct injection system; Repairing accelerator mechanism

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
10	22 + 21	Gearbox oil temperature sender - G93	▪ Ignition switched off	0.5 ... 3 kW	- Test wiring using current flow diagram
	22 + 6 21 + 6			$\infty \omega$	- Replace gearbox wiring harness
11 1)	14 + 42	Gearbox speed sender -G38	▪ Ignition switched off	approx. 1 kW	- Test wiring using current flow diagram
	14 + 15			$\infty \omega$	- Replace gearbox speed sender -G38



Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
	42 + 20			> 500 Ω	=> Automatic gearbox 01K, front-wheel drive; Repair group 38; Removing and installing gearbox speed sender

1) Only for gearbox 01K.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
12 2)	6 + 38	Speed sensor front left -G47	▪ Ignition switched off ▪ Control unit for anti-lock brake system -J104 disconnected	$\infty\omega$	- The wiring connections for the anti-lock brake system -J104 are tested - Test wiring according to current flow diagram.
	xx 1) + 38			$\leq 1.5\omega$	
13 2)	6 + 39	Speed sensor Front right -G45		$\infty\omega$	
	xx1) + 39			$\leq 1.5\omega$	
14 2)	6 + 40	Speed sensor Rear left -G44		$\infty\omega$	
	xx 1) + 40			$\leq 1.5\omega$	
15 2)	6 + 41	Speed sensor Rear right -G46		$\infty\omega$	
	xx1) + 41			$\leq 1.5\omega$	
16 3)	6 + 19	Input signal from control unit for ABS (EDL)		$\infty\omega$	
	xx1) + 19			$\leq 1.5\omega$	

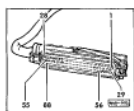
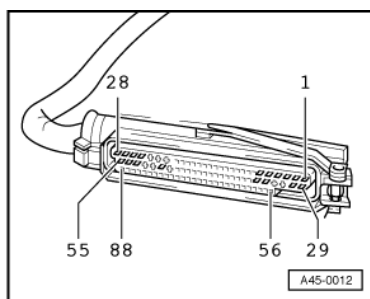
1) Contact on disconnected control unit connector for anti-lock brake system -J104 => Page 113.

2) Only for gearbox 01F.

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3) Only for gearbox 01K.

Notes on test steps 12, 13, 14, 15, 16:



- ◆ -> Contact assignment on 88-pin connector of ABS control unit.
- ◆ Location: On left under rear seat.

- Connect adapter V.A.G 1598/20 to ABS control unit connector.

=> Running gear, Four-wheel drive; Repair Group 01; Self-diagnosis Electrical Test Self-diagnosis Electrical Test

- ◆ Contacts for wiring connections of gearbox control unit

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	Test conditions - Additional operations	Specification	Action in the event of deviation from specification
17	30 + 53	Solenoid valve 1 - N88	▪ Ignition switched off	30 ... 40 ω	- Test wiring between 8-pin connector and gearbox control unit => Page 128
	30 + 55 30 + 6			$\infty\omega$	- Testing wiring harness in gearbox => Page 128
18	33 + 53	Solenoid valve 2 - N89	▪ Ignition switched off	30 ... 40 ω	- Test wiring between 8-pin connector and gearbox control unit => Page 128
	33 + 55 33 + 6			$\infty\omega$	- Testing wiring harness in gearbox => Page 128

Notes for testing solenoid valves:

If the specifications are not attained, but the solenoid valves do not react in the final control diagnosis, test the actuation of the solenoid valves => Page 125. If this test does not reveal any fault affecting the activation of the valve, replace the relevant solenoid valve or the valve body.

=> Automatic gearbox 01F, four-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

=> Automatic gearbox 01K, front-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	Test conditions - Additional operations	Specification	Action in the event of deviation from specification
19	32 + 53	Solenoid valve 3 - N90	▪ Ignition switched off	30 ... 40 ω	- Test wiring between 8-pin connector and gearbox control unit => Page 128
	32 + 55 32 + 6			$\infty\omega$	- Testing wiring harness in gearbox => Page 128



Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
20	5 + 53	Solenoid valve 4 - N91	▪ Ignition switched off	5 ... 8 ω	- Test wiring between 8-pin connector and gearbox control unit => Page 128
	5 + 55 5 + 6			$\infty \omega$	- Testing wiring harness in gearbox => Page 128

Notes for testing solenoid valves:

If the specifications are not attained, but the solenoid valves do not react in the final control diagnosis, test the actuation of the solenoid valves => Page 125. If this test does not reveal any fault affecting the activation of the valve, replace the relevant solenoid valve or the valve body.

=> Automatic gearbox 01F, four-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

=> Automatic gearbox 01K, front-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
21	20 + xx 1)	Engine/gearbox electrical connection	▪ Ignition switched off ▪ Engine control unit disconnected	$\leq 1.5 \omega$	- Test wiring using current flow diagram
	20 + 55 20 + 6			$\infty \omega$	
22	25 + 55	Selection range display -Y5	▪ Ignition switched on ▪ Replace multi-function switch -F125 OK ▪ Diode test lamp V.A.G 1527 A connected to sockets	Diode test lamp should illuminate	- Test wiring using current flow diagram Rectify fault in dash panel insert => Electrical System; Repair Group 90; Repair dash panel insert Repair dash panel insert

1) Corresponding contact assignment on connector of engine control unit

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Note for testing the selection range display -Y5:

Only perform the test if the selector lever position is not indicated on the selector range display.

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If no deviations from the specification are found in this test, but the self-diagnosis and measured value block indicate faults in the signal, the gearbox control unit must be replaced => Page 17.

6.3 - Test table for vehicles with 88-pin control unit (MY 96 ä: gradual introduction)



23	7 + 6	Input signal for accelerator pedal value (throttle valve)	▪ Ignition switched on ▪ Fault memory of engine control unit interrogated ▪ Diode test lamp V.A.G 1527 A connected to sockets Press accelerator pedal	The diode test lamp must illuminate slightly and become brighter on pressing the accelerator pedal.	- Test throttle valve potentiometer or accelerator pedal position sender => Motronic injection and ignition system (6-cylinder); Repair Group 24; Repairing Motronic injection system; Testing throttle valve position Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position => MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 24; Repairing Multi-Point Injection system; Testing output signal for throttle valve position
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(cont.)



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Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
23	7 + 6	Input signal for accelerator pedal value (throttle valve)	Or: - V.A.G 1767 connected to earth (socket 6) with test leads from V.A.G 1594 A and to socket 7 with green connector Accelerator pedal not depressed	Duty cycle approx. 13 %	- Test wiring according to current flow diagram. Test throttle valve potentiometer or accelerator pedal position sender => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing control unit input values; Testing accelerator pedal position sender -G79 Testing control unit input values; Testing accelerator pedal position sender -G79

(cont.) ▼					=> Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing output signal for throttle valve position
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Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
23	7 + 6	Input signal for accelerator pedal value (throttle valve)	- V.A.G 1767 connected to earth (socket 6) with test leads from V.A.G 1594 A and to socket 7 with green connector Accelerator pedal pressed down until full throttle	Duty cycle increasing evenly to approx. 83 %	- Test throttle valve potentiometer or accelerator pedal position sender => Motronic injection and ignition system (6-cylinder); Repair Group 24; Repairing Motronic injection system; Testing throttle valve position Repairing Multi-Point Fuel Injection system; Testing output signal for throttle valve position

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
24	35 + 6	Fuel consumption signal	▪ Fault memory of engine control unit interrogated ▪ Engine running at idling speed ▪ Diode test lamp V.A.G 1527 A connected to sockets Press accelerator pedal	Diode test lamp must flash faintly and slowly and then become brighter and faster as the speed increases.	- If deviations from the specification are found, connect display unit to computer -J128 and repeat the test. If no deviations from the specification are found without -J128, test -J128 and replace if necessary. Testing actuation of the vehicle computer



(cont.) ▼					=> Diesel direct injection and glow plug system (TDI 5-cyl.), Repair group 23; Testing auxiliary signals; Testing actuation of vehicle computer (fuel consumption display)
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Note on testing the fuel consumption signal:

If no deviations from the specification are found in this test, but the self-diagnosis and measured value block indicate faults in the signal, the gearbox control unit must be replaced => Page 17.

Test step	V.A.G 1598/20 sockets	Testing of	- Test conditions - Additional operations	Specification	Action in the event of deviation from specification
24 (cont.) ▼	35 + 6	Fuel consumption signal	- Fault memory of engine control unit interrogated - Engine running at idling speed - Diode test lamp V.A.G 1527 A connected to sockets - Press accelerator pedal	Diode test lamp must flash faintly and slowly and then become brighter and faster as the speed increases.	- Testing actuation of the vehicle computer => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing actuation of vehicle computer for fuel consumption display Repairing Motronic injection system; Testing fuel consumption signal for vehicle computer

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Test step	V.A.G 1598/20 sockets	Testing of	- Test conditions - Additional operations	Specification	Action in the event of deviation from specification
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24	35 + 6	Fuel consumption signal	▪ Fault memory of engine control unit interrogated ▪ Engine running at idling speed ▪ Diode test lamp V.A.G 1527 A connected to sockets Press accelerator pedal	Diode test lamp must flash faintly and slowly and then become brighter and faster as the speed increases.	- Testing actuation of the vehicle computer => MPFI injection and ignition system (6-cylinder); Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing actuation of vehicle computer (fuel consumption display) Repairing Multi-Point Fuel Injection system; Testing actuation of vehicle computer (fuel consumption display) - Test wiring according to current flow diagram.
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Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
24	35 + 6	Fuel consumption signal	Or: ▪ V.A.G 1767 connected to earth (socket 6) with test leads from V.A.G 1594 A and to socket 35 with green connector Accelerator pedal not actuated	Duty cycle $\leq 5\%$	- If deviations from the specification are found, connect display unit to computer -J128 and repeat the test. If no deviations from the specification are found without -J128, test -J128 and replace if necessary.

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(cont.) ▼					- Testing actuation of the vehicle computer => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing auxiliary signals; Testing actuation of vehicle computer (fuel consumption display) Testing auxiliary signals; Testing actuation of vehicle computer (fuel consumption display)
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Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
24 (cont.) ▼	35 + 6	Fuel consumption signal	▪ V.A.G 1767 connected to earth (socket 6) with test leads from V.A.G 1594 A and to socket 35 with green connector Press accelerator pedal to full throttle	Duty cycle increasing to $\geq 20\%$	- Testing actuation of the vehicle computer => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing actuation of vehicle computer for fuel consumption display Repairing Motronic injection system; Testing fuel consumption signal for vehicle computer

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
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24	35 + 6	Fuel consumption signal	- V.A.G 1767 connected to earth (socket 6) with test leads from V.A.G 1594 A and to socket 35 with green connector - Press accelerator pedal to full throttle	Duty cycle increasing to $\geq 20\%$	- Testing actuation of the vehicle computer => MPFI injection and ignition system (6-cylinder); Repair Group 24; Repairing Multi-Point Fuel Injection system; - Testing actuation of vehicle computer (fuel consumption display) Repairing Multi-Point Fuel Injection system; - Testing actuation of vehicle computer (fuel consumption display) - Test wiring according to current flow diagram.
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Test step	V.A.G 1598/20 sockets	Testing of	- Test conditions - Additional operations	Specification	Action in the event of deviation from specification
25		Engine speed input signal	- Fault memory of engine control unit interrogated - Selector lever in position P or N - Engine running at idling speed - Press accelerator pedal	The speed is displayed on the rev counter according to the engine speed	- Test wiring using current flow diagram - Remove connector from gearbox control unit and repeat test - If the engine speed is now displayed on the rev counter, replace gearbox control unit - If the engine speed is not displayed, continue from test step 26

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	- Test conditions - Additional operations	Specification	Action in the event of deviation from specification



26	43 + xx 1)	Wiring between gearbox control unit and engine control unit for engine speed input signal	▪ Ignition switched off ▪ Connector for engine control unit, gearbox control unit, rev counter and if necessary, additional components removed => current flow diagram ▪ Adapter V.A.G 1598/20 connected to wiring harness for gearbox control unit	$\leq 1.5 \omega$	- Test wiring according to current flow diagram. If no deviations from the specification are found in this test, test actuation of the rev counter => Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing auxiliary signals; Testing actuation of rev counter Testing auxiliary signals; Testing actuation of rev counter => Motronic injection and ignition system (5-cylinder); Repair Group 24; Repairing Motronic injection system; Testing actuation of rev counter
(cont.) ▼					

1) Corresponding contact assignment on connector of engine control unit

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
26	43 + xx 1)	Wiring between gearbox control unit and engine control unit for engine speed input signal	▪ Ignition switched off ▪ Connector for engine control unit, gearbox control unit, rev counter and if necessary, additional components removed => current flow diagram	$\leq 1.5 \omega$	=> Motronic injection and ignition system (6-cylinder); Repair Group 24; Repairing Motronic injection system; Testing throttle valve position => MPFI injection and ignition system (6-cylinder); Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing actuation of rev counter Repairing Multi-Point Fuel Injection system; Testing actuation of rev counter

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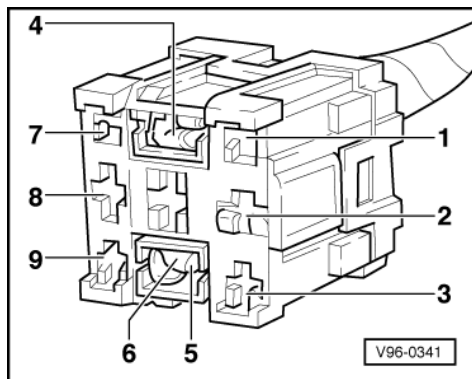
	43 + 6		▪ Adapter V.A.G 1598/20 only connected to wiring harness for gearbox control unit	$\infty \omega$	=> MPI fuel injection and ignition system (6-cyl.) 06.94 ä; Repair Group 24; Repairing Multi-Point Fuel Injection system; Testing actuation of rev counter
--	--------	--	---	-----------------	--

- 1) Corresponding contact assignment on connector of engine control unit
=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
27	10 + xx 1)	Selector lever lock solenoid - N110	▪ Ignition switched off ▪ Selector lever lock relay - J378 disconnected ▪ Adapter V.A.G 1598/20 connected to wiring harness for gearbox control unit	10 ... 20 ω	- Test wiring using current flow diagram. Replace solenoid for selector lever lock -N110. => Automatic gearbox 01F four-wheel drive; Repair Group 37; Servicing shift mechanism; Dismantling and assembling shift mechanism Servicing shift mechanism; Dismantling and assembling shift mechanism

- 1) Contact 8 on the connector of the selector lever lock relay -J378, contact assignment on the connector
=> Page 123 .

Notes on test step 27:



- ♦ -> Contact assignment on the connector of the disconnected selector lever lock relay -J378.
- ♦ Location: Auxiliary relay carrier II



=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Test step	V.A.G 1598/11 socket	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
28	Earth + xx 1)	Auxiliary signal for air conditioner (when kickdown is activated)	▪ Adapter cable V.A.G 1598/11 connected to the wiring harness connector C and to the air conditioner operating and display unit - E87 2) ▪ Ignition switched on Final control diagnosis initiated and kickdown switch -F8 actuated => Page 43	Diode test lamp V.A.G 1527 A must flash	- Test wiring using current flow diagram Test function of air conditioner => Heating, air conditioner; Repair group 01; Self-diagnosis; Interrogating fault memory Self-diagnosis; Interrogating fault memory

1) Connect diode test lamp V.A.G 1527 A with test leads from V.A.G 1594 to the corresponding contacts or sockets on V.A.G 1598/11 for the kickdown signal on the air conditioner operating and display unit -E87.

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

2) Connect V.A.G 1598/11

=> Heating, air conditioner; Repair group 01; Self-diagnosis; Connecting test box V.A.G 1598 to the connector for air conditioner operating and display unit -E87 Self-diagnosis Connecting test box V.A.G 1598 to the connector for air conditioner operating and display unit -E87

7 - Electric tests - all model years

7.1 - Electric tests - all model years

7.2 - Unplugging 8-pin connector on gearbox

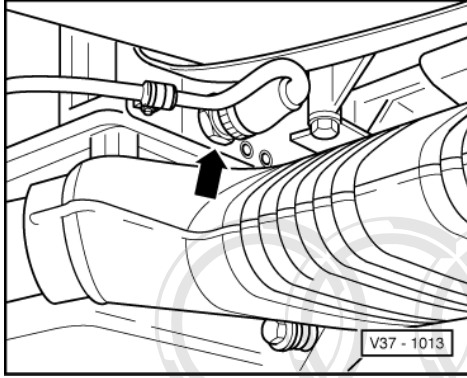
- If necessary, remove exhaust pipe with catalytic converter.

=> 5-cyl. diesel engine, mechanical components (2.5 l engine); Repair Group 26; Removing and installing exhaust system parts Removing and installing exhaust system parts

=> 5-cyl. injection engine (4-valve turbo), mechanical components; Repair Group 26; Removing and installing parts of exhaust system Removing and installing parts of exhaust system

=> 6-cyl. injection engine (2.6 l engine, 2-valve), mechanical components; Repair group 26; Removing and installing exhaust system; B - vehicles with four-wheel drive Removing and installing exhaust system B - vehicles with four-wheel drive

=> 6-cyl. injection engine (2-valve), mechanical components; Repair group 26; Removing and installing exhaust system; C - vehicles with four-wheel drive Removing and installing exhaust system C - vehicles with four-wheel drive



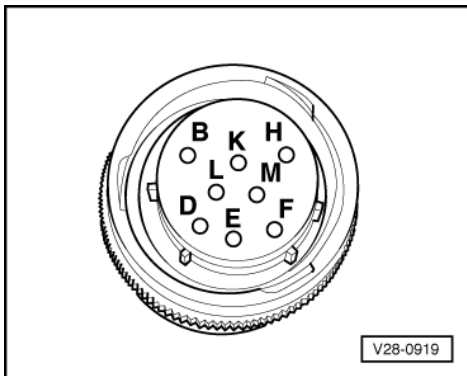
=> 6cylinder engine (5-valve), mechanical components; Repair Group 26; Removing and installing exhaust system parts; Vehicles with four-wheel drive, engine code ACK Removing and installing exhaust system parts
Vehicles with four-wheel drive, engine code ACK

- -> Detach bayonet lock from 8-pin connector -arrow-by turning to the left and unplug connector from gearbox.

7.3 - Testing activation of solenoid valves

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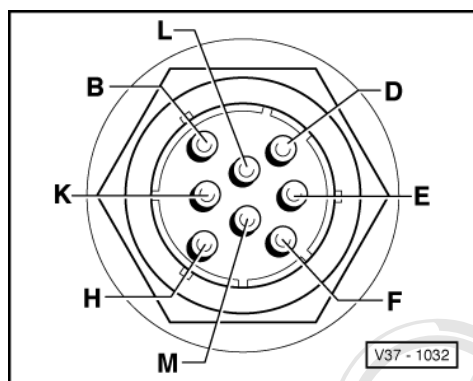
- Unplug 8-pin connector from gearbox =>Page **124** .
- Initiate final control diagnosis =>Page **43** and activate the solenoid valve to be tested.



- -> Connect diode test lamp V.A.G 1527 A with test leads from V.A.G 1594 to the corresponding connector contacts:

Component	Contacts on connector
Solenoid valve 1 -N88	M + H
Solenoid valve 2 -N89	M + K
Solenoid valve 3 -N90	M + L
Solenoid valve 4 -N91 1)	M + B

- 1) Note test requirements

**Test requirements for solenoid valve 4 -N91:**

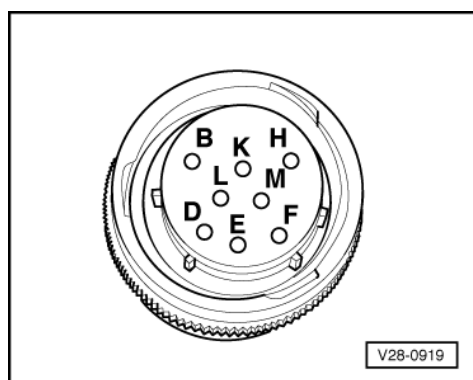
- -> To test activation of solenoid valve 4 -N91, the connector contacts M and B with test leads from V.A.G 1594 must be connected to the contacts M and B of the plug connector. In parallel with the above, the diode test lamp V.A.G 1527 A must be connected, i.e. the diode test lamp must also be connected from M to B.
- For the 55-pin gearbox control unit, this test can also be performed with the plugged-in connector and using test box V.A.G 1598 A => Electrical test, test step "Activation of solenoid valve 4 -N91" from Page 80 .

The diode test lamp must flash on actuation of the relevant solenoid valve in the final control diagnosis.

- If the diode test lamp does not flash on actuation of the solenoid valve:
 - Test solenoid valve relay =>Page 126 .
- If no defects are found in the test for the solenoid valve relay:

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 - Test wiring between multiple connector of gearbox control unit and 8-pin connector on gearbox => Page 128 .
 - If a defect is found in the actuation of solenoid valve 4 -N91, test the wiring harness in the gearbox => Page 128 .
 - If no defects are found in the wiring test, replace control unit for automatic gearbox -J217 => Page 17 .
 - After completing the test and reconnecting 8-pin connector, delete fault memory => Page 46 .

Test solenoid valve relay

- Unplug 8-pin connector from gearbox => Page 124 .
- -> Connect diode test lamp V.A.G 1527 A with test leads from V.A.G 1594 A to contact -M- of connector and gearbox earth.
- Switch on ignition, initiate final control diagnosis => Page 43 :
- The diode test lamp must illuminate.

Note:

The diode test lamp must flash on actuation of the solenoid valve relay in the final control diagnosis.

- If the diode test lamp does not illuminate:

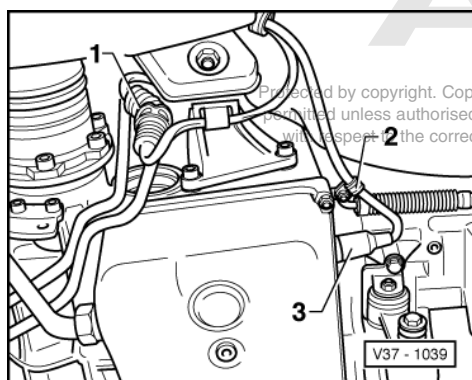
- Test wiring between multiple connector of gearbox control unit and 8-pin connector on gearbox => Page 128 .
- If no defects are found in the wiring test, replace control unit for automatic gearbox -J217 => Page 17 .
- After completing the test and reconnecting 8-pin connector, delete fault memory => Page 46 .

7.4 - Test wiring between control unit for automatic gearbox -J217 and gearbox

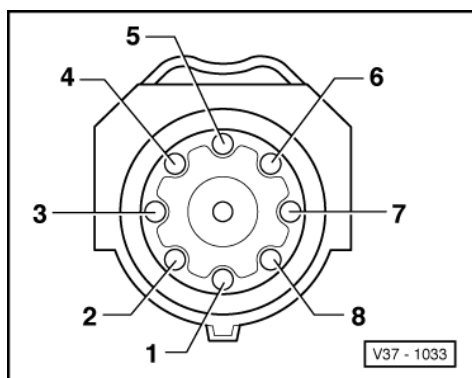
Test requirements:

- Gearbox control unit disconnected
- Ignition switched off
- Test box V.A.G 1598 A with adapter cable V.A.G 1598/5 connected to the disconnected 55-pin multiple connector or with adapter 1589/20 to the disconnected 88-pin multiple connector of the gearbox wiring harness.
- Set down the test box outside of vehicle.

Test wiring to F125 multi-function switch



- -> Remove spring bracket lock of connector -1- for multifunction switch -F125.



- -> Test wiring connections with V.A.G 1526 A and test lead from V.A.G 1594 between the contacts of the connector and sockets of test box V.A.G 1598 A or of adapter V.A.G 1598/20 according to current flow diagram.

Note:

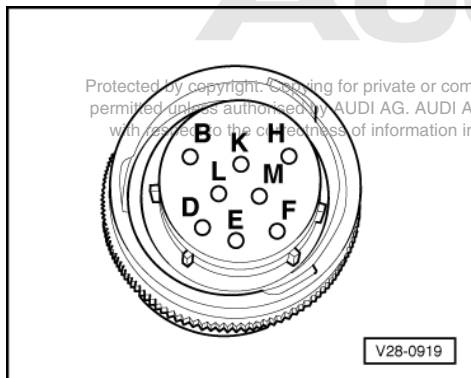
- ♦ In particular, test for contact corrosion, leaks and water damage in the connectors.
- ♦ If no impermissible deviations were found in the wiring test but the test table shows deviations, replace multi-function switch -F125.



=> Automatic gearbox 01F, Four-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125. Dismantling and assembling gearbox Removing and installing multi-function switch -F125.

=> Automatic gearbox 01K, front-wheel drive; Repair group 37; Dismantling and assembling gearbox; Removing and installing multi-function switch -F125 Dismantling and assembling gearbox Removing and installing multi-function switch -F125

Test wiring to 8-pin connector on the gearbox



- Unplug 8-pin connector from gearbox => Page 124 .
- -> Test wiring connections with V.A.G 1526 A and test lead from V.A.G 1594 between the contacts of the 8-pin connector and sockets of test box V.A.G 1598 A or of adapter V.A.G 1598/20 according to current flow diagram.

Note:

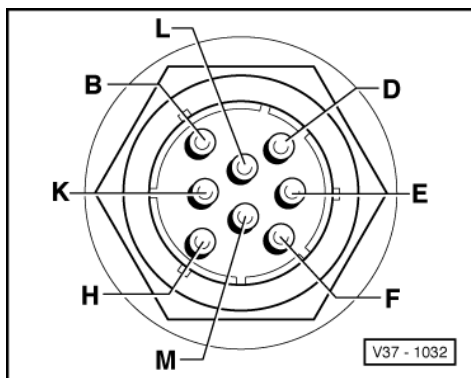
In particular, test for contact corrosion, leaks and water damage in the connectors.

Testing wiring harness in gearbox

Note:

Perform test if the solenoid valves do not click in the final control diagnosis or if defects were found in the electrical test of the solenoid valves with test box V.A.G 1598, but the wiring connections from the gearbox control unit to the 8-pin connector are OK.

- Unplug 8-pin connector from gearbox => Page 124 .



- -> Connect hand-held multimeter V.A.G 1526 A with test leads from V.A.G 1594 to the connector according to the table for the resistance measurement.

Component	Contacts on connector	Specification ω
Solenoid valve 1 - N88	M + H	30 ... 40

Component	Contacts on connector	Specification ω
Solenoid valve 2 - N89	M + K	30 ... 40
Solenoid valve 3 - N90	M + L	30 ... 40
Solenoid valve 4 - N91	M + B	5 ... 8
Gearbox oil temperature sender - G93 at approx. 20 °C	E + F	500 ... 3000 940

- If any deviations from the specification are found in this test:
 - Detach wiring harness from relevant solenoid valve and test according to current flow diagram. If necessary, replace wiring harness.
 - Measure resistance at solenoid valve again and replace valve or valve body if necessary.

=> Automatic gearbox 01F, four-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

=> Automatic gearbox 01K, front-wheel drive; Repair Group 38; Removing and installing oil pan, ATF screen and valve body; Removing and installing valve body Removing and installing oil pan, ATF screen and valve body Removing and installing valve body

7.5 - Testing output signal for gearshift

Note:

This signal enables smoother gearshifts by momentarily retarding the ignition timing.

- Interrogate fault memory of engine control unit

=> Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 01; Self-diagnosis for diesel direct injection system; Interrogating and erasing fault memory Self-diagnosis for diesel direct injection system Interrogating and erasing fault memory

=> Motronic injection and ignition system (5-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system Interrogating and erasing fault memory

=> Motronic injection and ignition system (6-cylinder); Repair group 01; Self-diagnosis of Motronic system; Interrogating and erasing fault memory Self-diagnosis of Motronic system Interrogating and erasing fault memory

=> MPFI injection and ignition system (6-cyl.); Repair Group 01; Self-diagnosis for Multi-Point Fuel Injection (MPFI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point Fuel Injection (MPFI) Interrogating and erasing fault memory

=> MPI injection and ignition system (6-cyl.) ä 05.94; Repair Group 01; Self-diagnosis for Multi-Point Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point Injection (MPI) Interrogating and erasing fault memory

=> MPI injection and ignition system (6-cyl.) 06.94 ä; Repair Group 01; Self-diagnosis for Multi-Point Injection (MPI); Interrogating and erasing fault memory Self-diagnosis for Multi-Point Injection (MPI) Interrogating and erasing fault memory

- Test wiring to control unit for gearbox

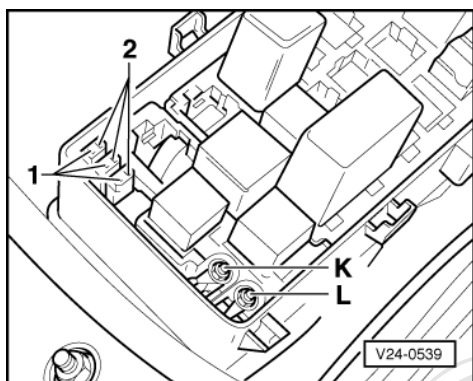


=> Diesel direct injection and glow plug system (TDI 5-cyl.); Repair group 23; Testing auxiliary signals; Testing wiring connections to gearbox control unit Testing auxiliary signals Testing wiring connections to gearbox control unit

=> Motronic injection and ignition system (6-cylinder); Repair Group 24; Testing additional signals; Testing ignition timing retardation during gearshift Testing additional signals Testing ignition timing retardation during gearshift

7.6 - Testing wiring for diagnostic connector

Testing voltage supply to black diagnostic connector



-> Installation position of diagnostic connector: In relay carrier I

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Contact assignment for black diagnostic connector:

- 1 - Earth
- 2 - Terminal 30

Note:

- ♦ Testing is to be carried out with the hand-held multimeter V.A.G 1526 A and measuring tool set V.A.G 1594 A.
- ♦ Switch off ignition before testing wiring connections.

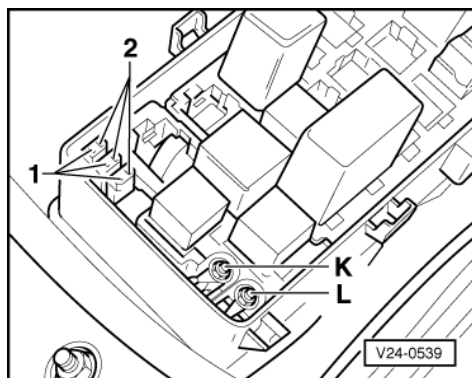
Switch on measuring range: Voltage measurement				
contact Diagnosis socket	Testing of	Test conditions - Additional operations	Specification	Action in the event of deviation from specification
1 1) + Body earth	Wiring according to body earth	- Ignition switched off Ignition switched on	0 V	- Test wiring using current flow diagram
2 1) + Body earth	Wiring according to permanent positive (terminal 30)	- Ignition switched off Ignition switched on	approx. battery voltage	- Test wiring using current flow diagram

1) Earth connection and voltage supply for black diagnostic connector => Fig. Page 130

Switch on measuring range: Resistance measurement				
contact Diagnosis socket	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
1 1) + Body earth	Wiring according to body earth	- Ignition switched off	$\leq 1.5 \omega$	- Test wiring using current flow diagram

1) Earth connection for black diagnostic connector => Fig. Page 130

Test wiring between white diagnostic connector and control unit for automatic gearbox -J217.



-> Installation position of diagnostic connector and wiring junction K: In relay carrier I

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

Contact assignment for white diagnostic connector:

- 1 - L-Wire (not required here)
- 2 - K-Wire

Note:

- ♦ The wiring between white diagnostic connector (contact 2) and gearbox control unit via wiring junction K

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

- ♦ To test hand-held multimeter V.A.G 1526 A, use measuring tool set V.A.G 1594 A and test box V.A.G 1598 A with adapter cables V.A.G 1598/5 or adapter V.A.G 1598/20.
- ♦ Switch off ignition before testing wiring connections.

- Connect test box V.A.G 1598 A with adapter cable V.A.G 1598/5 or adapter V.A.G 1598/20 only on the wiring harness of the gearbox control unit => Page 102 .

Switch on measuring range: Resistance measurement					
Control unit version	V.A.G 1598 A socket + contact for auxiliary relay carrier 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
55-pin	51 + K 2) 51 + 2 3)	Wiring	▪ Ignition switched off	$\leq 1.5 \omega$	- Test wiring using current flow diagram
	51 + Car body earth point		- Control unit -J217 disconnected	$\infty \omega$	- Measures in the event of a short circuit => Page 132



Switch on measuring range: Resistance measurement					
Control unit version	V.A.G 1598 A socket + contact for auxiliary relay carrier 1)	Testing of	▪ Test conditions - Additional operations	Specification	Action in the event of deviation from specification
	V.A.G 1598/20 socket + contact for auxiliary relay carrier				
88-pin	31 + K 2) 31 + 2 3)	Wiring	▪ Ignition switched off	≤ 1.5 Ω	- Test wiring using current flow diagram
	31 + Car body earth point			∞ Ω	- Measures in the event of a short circuit => Page 132

- 1) Connect with adapter cable V.A.G 1598/5.
- 2) Corresponding contact on auxiliary relay carrier I => Fig. Page 131
- 3) Corresponding contact on white diagnostic connector => Fig. Page 131

Testing for short to positive or earth in wiring to white diagnostic connector**Note:**

This test has to be performed if one of the following displays appears on the connected fault reader V.A.G 1551.

-> Indicated on display:

Rapid data transfer
Communication problem

or

Rapid data transfer HELP
K- wire not switching to earth

or

Rapid data transfer HELP
K-wire not switching to positive

-> Indicated on display:

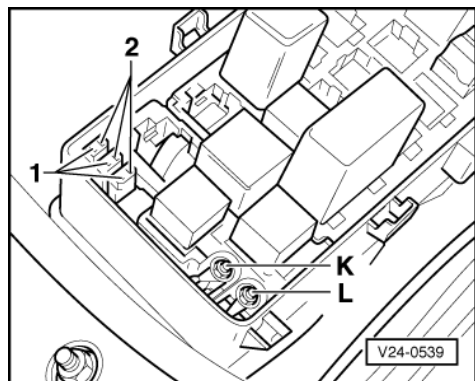
Control unit does not respond! HELP

Wiring to gearbox control unit has been interrupted.

Note:

Switch off ignition before disconnecting any wiring.

- Switch off ignition.



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- -> One by one, disconnect all wiring connections for other vehicle systems with self-diagnosis ("Rapid data transfer") from wiring junctions K and L.

=> "Current Flow Diagrams, Electrical Fault Finding and Fitting Locations" binder

- After the wiring to a vehicle system has been interrupted, switch on the ignition or allow engine to run at idle speed and re-enter address word 02 for "Gearbox electronics" => Page **21**.
- If the control unit identification and code then appears on the display, use the current flow diagram to test the wiring to the last control unit that was disconnected.
- If no wiring faults are found, replace the last control unit that was disconnected and re-connect all wires to wiring junction K.



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