

Audi A8 1994 ➤

Automatic Gearbox 01V Self-diagnosis								
Geartype	01V	01VA						

Edition 12.2001



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Repair GroupsList of Workshop Manual Repair Groups

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Automatic Gearbox 01V Self-diagnosis

Repair Group

01 - Self-diagnosis, Electrical check

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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, Electrical check

1 - Function of self-diagnosis

1.1 - Function of self-diagnosis

Control of the automatic gearbox is electronic/hydraulic.

The control unit -J217 for automatic gearbox contains information about components which influence gear shifting. Based on this information the control unit controls the corresponding solenoid valves in the valve body. The solenoid valves transfer the fluid pressure produced by the ATF pump to the clutches and brakes to be closed.

Fault recognition of gearbox control unit

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

The control unit is equipped with a fault memory so that the fault can be traced quickly in the event of an electronic/electrical component failure or an open circuit.

Faults are detected via electrical signals. If faults occur in the monitored sensors or components, these are stored in the memory together with an identification of the faulty component and an indication of the type of fault.

When a fault occurs for the first time, it will be stored in the memory as a static fault. If the fault does not occur again, it will then be reclassified initially as a sporadic fault (SP).

Faults which are stored as sporadic faults in the fault memory are displayed as "sporadic faults" during the fault interrogation. "SP" appears on the right of the display. If the printer is switched on, "sporadic faults" are printed out after the fault is addressed.

Sporadic faults stored in the fault memory are erased automatically after 40 cold engine starts (and subsequent gearbox warm-up).

The possibilities offered by self-diagnosis can only be utilised in full with the vehicle diagnostic, testing and information system VAS 5051 or the fault reader V.A.G 1551 (mode 1 "Rapid data transfer").

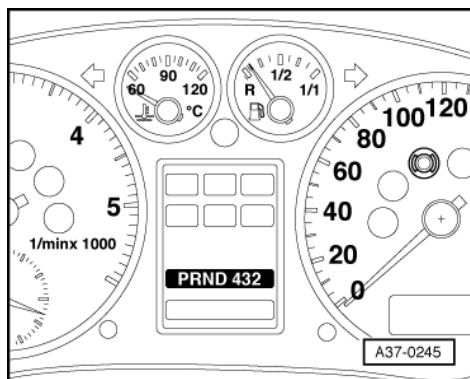
Functions which the vehicle diagnostic, testing and information system VAS 5051 can register => Page 25 , List of selectable functions.

Safety functions of engine control unit

If one or more of the system components or sensors fails, control unit -J217 switches to a corresponding back-up mode, or emergency running program. This enables the automatic gearbox to continue operating without becoming damaged, but will affect the operation and smoothness of the gearshifts accordingly.

When critical faults occur and with an active control unit -J217 the momentary selected gear will be kept. As soon as it is safe to do so (i.e. without damaging the gearbox or affecting driving), control unit -J217 will switch to the Mechanical emergency running mode with active control unit.

Mechanical emergency running with active control unit

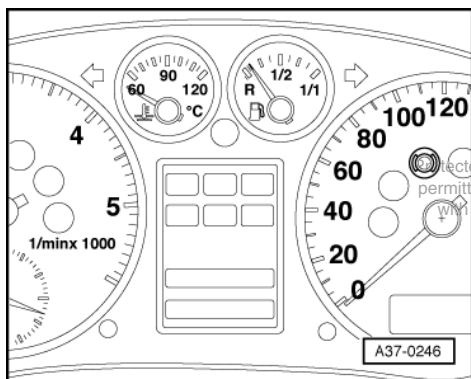




- Gearbox changes into hydraulic 4th gear from all forward gears. Converter clutch is open. All solenoid valves are inactive.
- Maximum switching pressure on force transferring elements.
- Reverse gear may be selected. Selector lever lock (in "P" and "N") is active.
- -> All segments of the gear display are completely illuminated.

When the control unit -J217 fails (e.g. failing of voltage supply, or disconnection of connector) the gearbox is immediately operated in "Mechanical emergency running mode with non-active control unit".

Mechanical emergency running with non-active control unit



- Gearbox changes into hydraulic 4th gear from all forward gears. Converter clutch is open. All solenoid valves are inactive.
- Maximum switching pressure on force transferring elements.
- Reverse gear may be selected. Selector lever lock (in "P" and "N") is inactive.
- -> All segments of the gear display are dark.
- Control unit -J217 is not functioning at all, i.e. it cannot be interrogated via self-diagnosis.

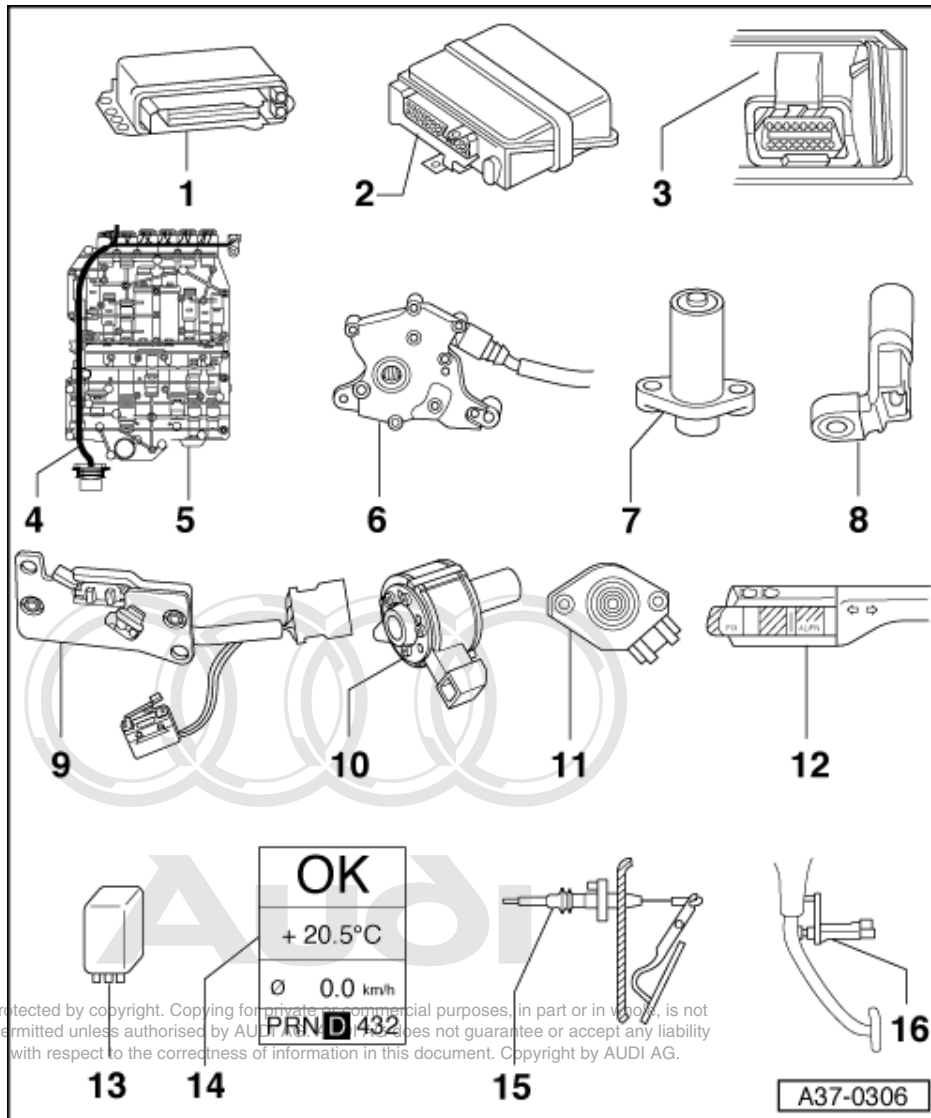
1.2 - Technical data of self-diagnosis

Fault memory	
- Non-volatile memory	yes
Data output	
- Rapid data transfer	yes
- Flash code output	no
Final control diagnosis	yes
Basic setting	no 1)
Encoding control unit	yes
Reading measured value block	yes
Electric/electronic components and fitting locations	=>Page 3

- 1) Resetting adaption values for gearbox control unit => Page 79

2 - Electric/electronic components and fitting locations

2.1 - Electric/electronic components and fitting locations

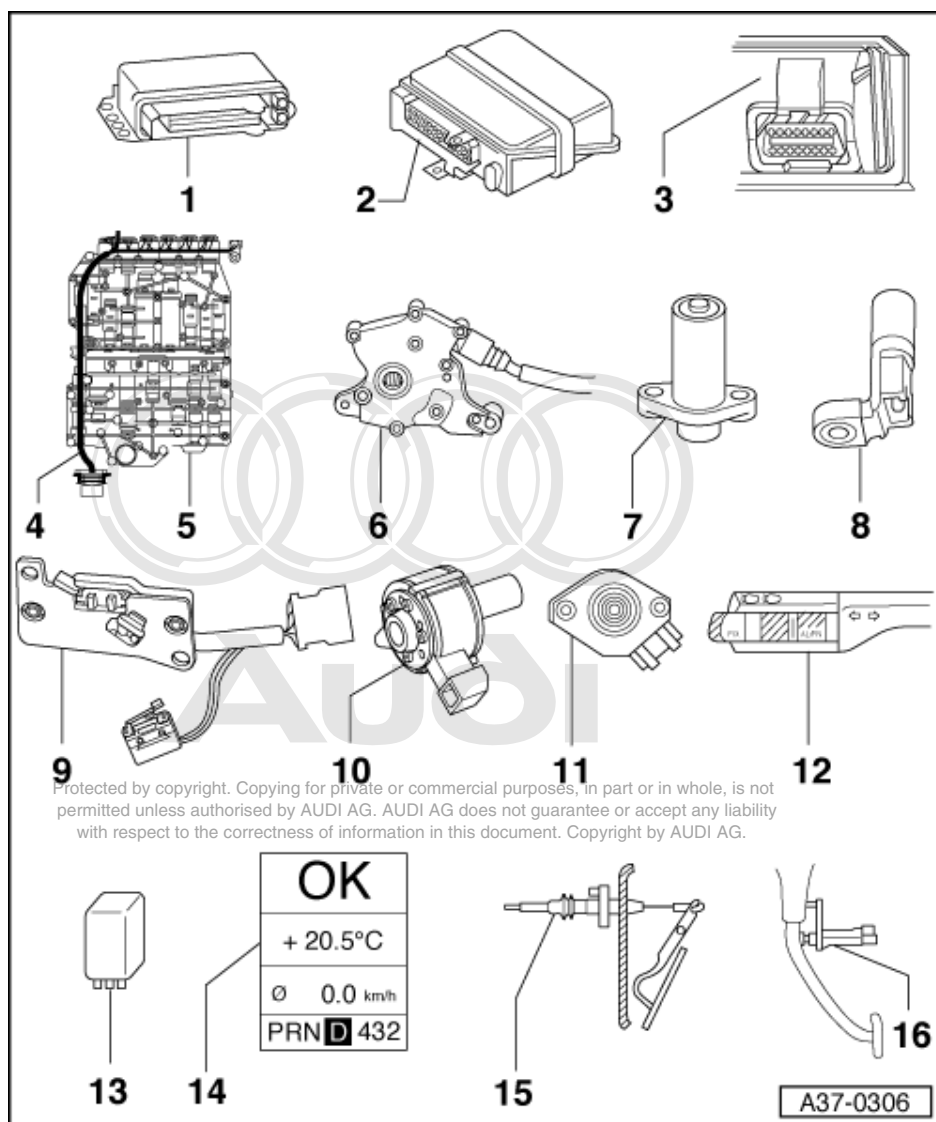


1 Control unit for automatic gearbox -J217

- ◆ Fitting location => Fig. 12
- ◆ Removing and installing: => Fig. 12
- ◆ Unplug multi-pin connector => Fig. 13
- ◆ Control unit is checked by self-diagnosis => Performing self-diagnosis

2 Engine control unit

- ◆ Fitting location => Fig. 13
- ◆ Control unit is checked by self-diagnosis => Performing self-diagnosis of engine

**3 Diagnostic socket**

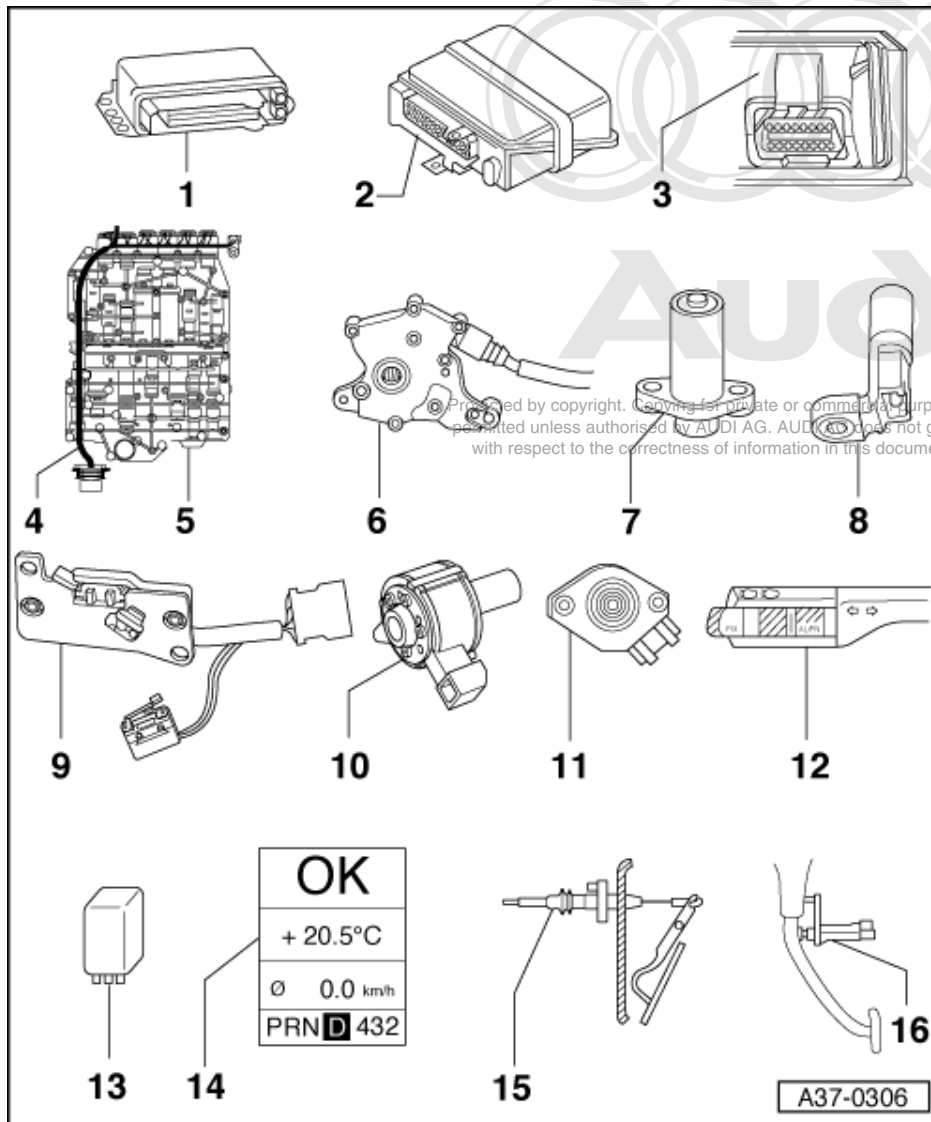
- ♦ Fitting location => Fig. 13

4 Internal gearbox wiring harness with integrated gearbox oil temperature sender (ATF) -G93

- ♦ Fitting location => Fig. 15
- ♦ -G93 is checked by self-diagnosis

5 Valve body

- ♦ Fitting location => Fig. 14
- ♦ The solenoid valves -N88, -N89, -N90, -N91, -N92, -N93 and -N94 are attached to the valve body.
- ♦ Components are checked by self-diagnosis

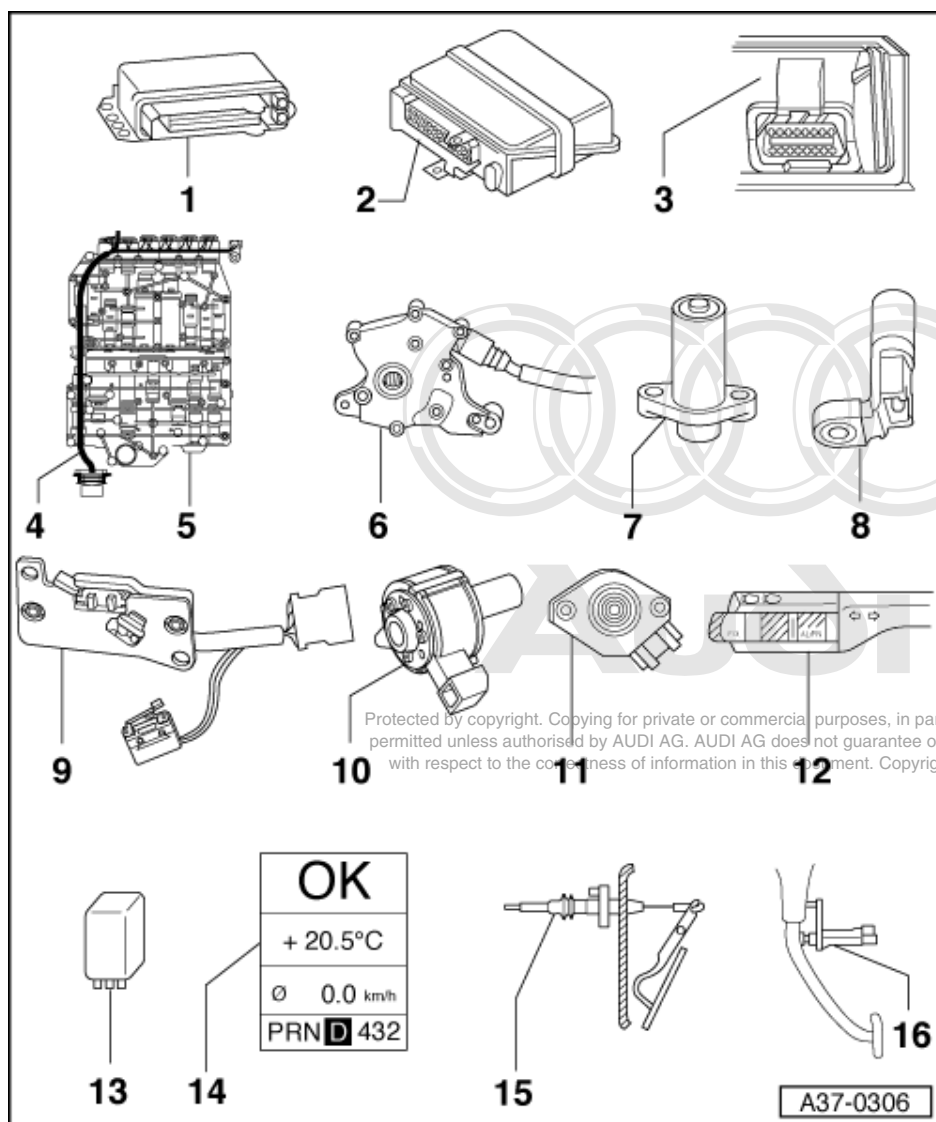


6 Multi-function switch -F125

- ♦ Fitting location and removing/installing =>Fig. 16
- ♦ Tested by self-diagnosis
- ♦ Can be checked in measured value block => Page 136

7 Sender for gearbox input speed -G182

- ♦ Fitting location and removing/installing =>Fig. 17
- ♦ Tested by self-diagnosis

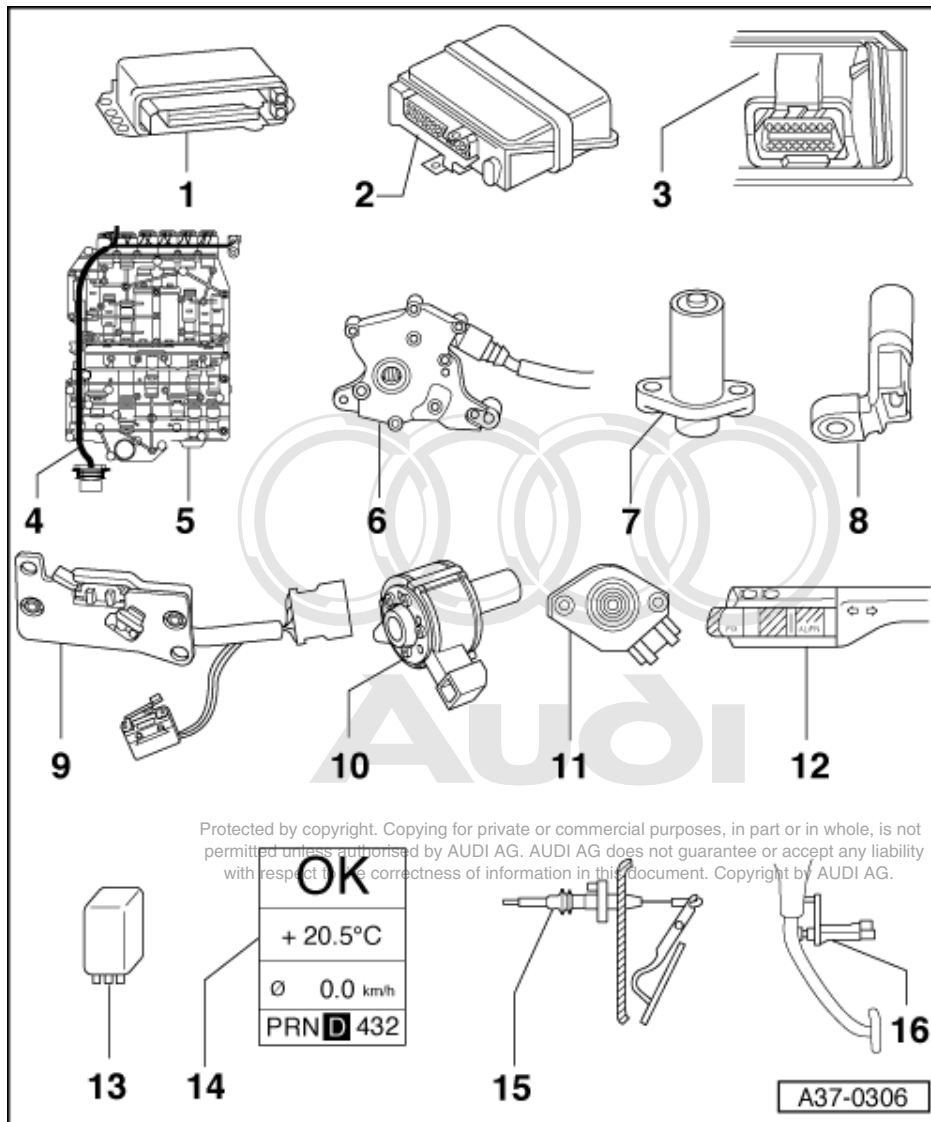


8 Gearbox speed sender -G38
 (is also referred to as sender for gearbox output speed -G195)

- ♦ Fitting location and removing/installing =>Fig. 16
- ♦ Tested by self-diagnosis
- ♦ Registers gearbox output speed

9 Switch for Tiptronic -F189

- ♦ Fitting location and removing/installing =>Fig. 16
- ♦ Tested by self-diagnosis
- ♦ Can be checked in measured value block => Page 136

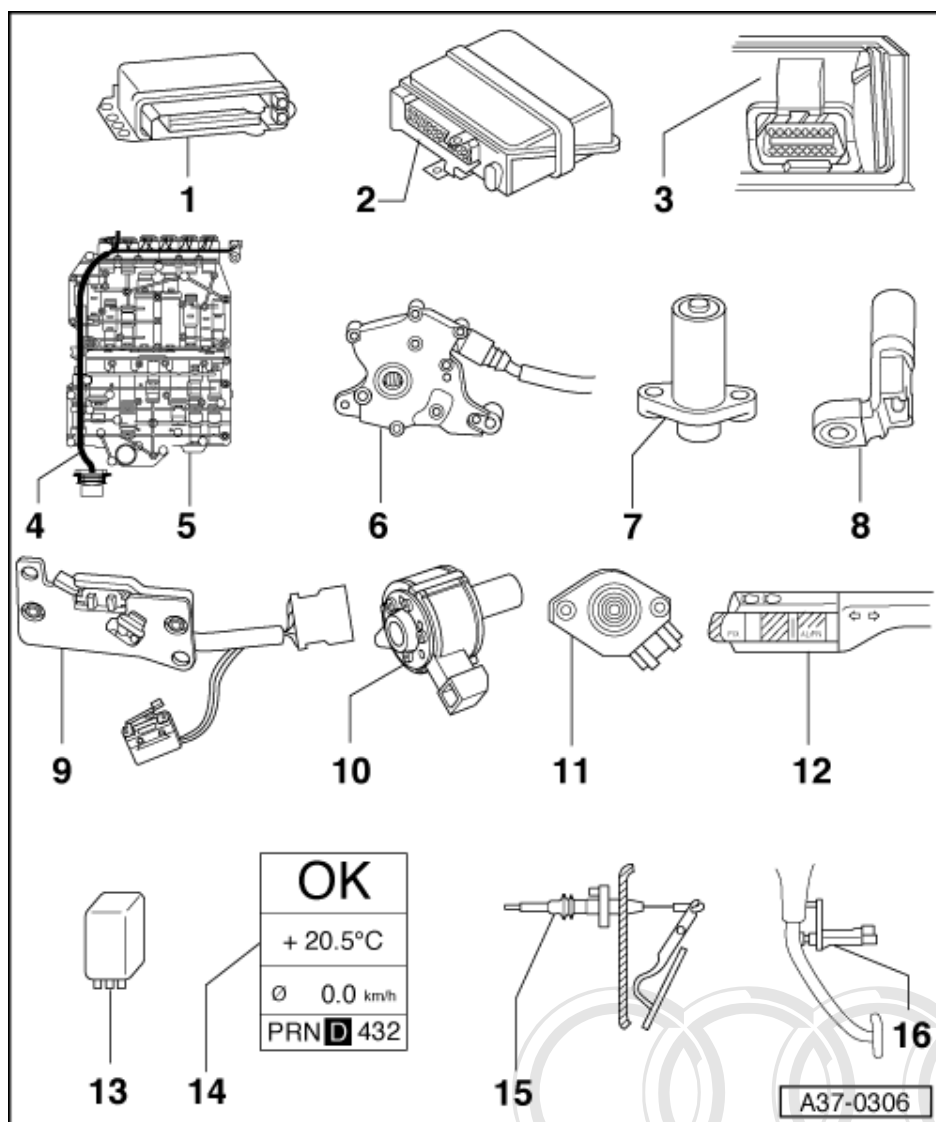


10 Selector lever lock solenoid -N110

- ♦ Fitting location => Fig. 18
- ♦ Removing and installing:

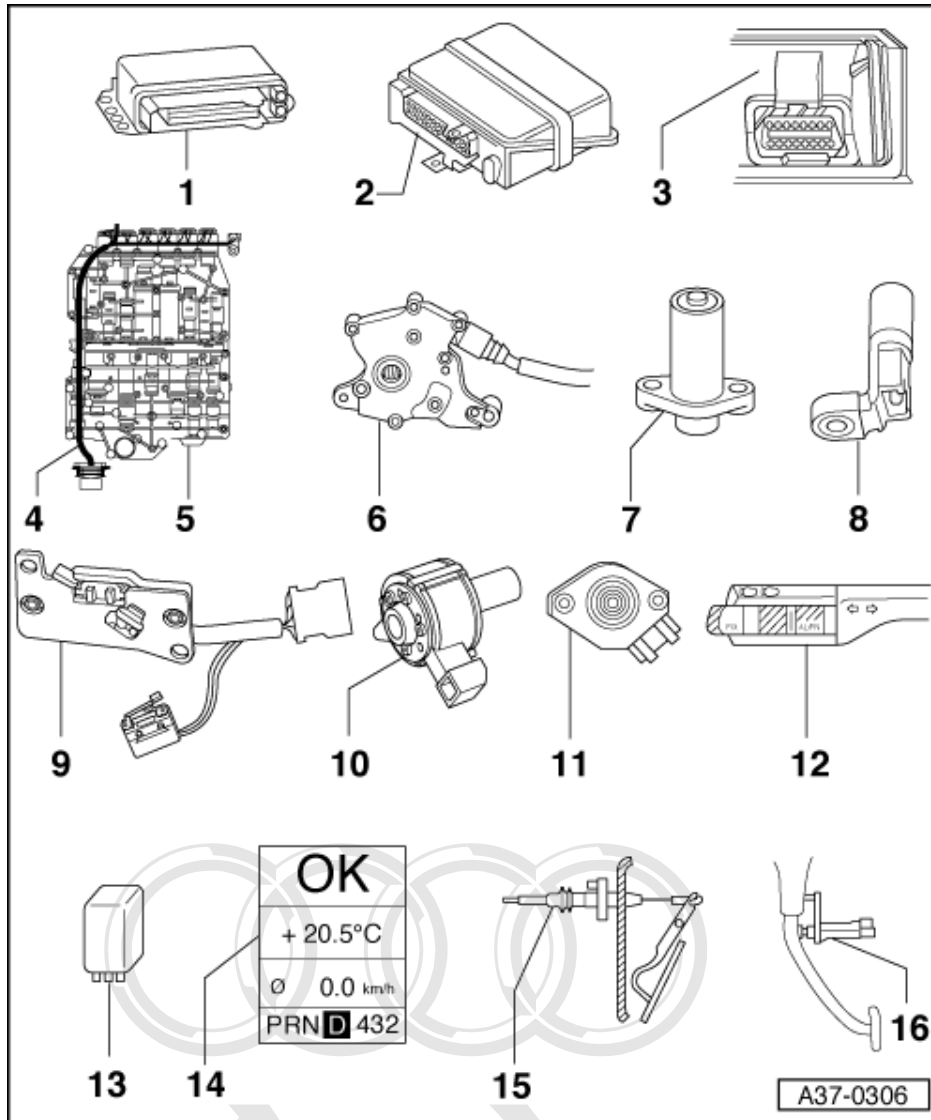
=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism; Dismantling and assembling shift mechanism Servicing shift mechanism Dismantling and assembling shift mechanism

- ♦ Can be checked in measured value block => Page 136

**11 -G69 throttle valve potentiometer**

- ◆ Fitting location => Fig. 18
 - ◆ The signal of the throttle flap potentiometer is checked with self-diagnosis.
 - ◆ Signal is sent from throttle flap potentiometer via the engine control unit to the gearbox control unit. Signal can only be checked in measured value block => Page 85. If the throttle flap potentiometer is shown as a fault during self-diagnosis then the self-diagnosis for the engine control unit must also be carried out.
- => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis

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12 Switch for speed control system -E45

- ◆ Fitting location: Cruise control switch is located at steering column switch.
- ◆ Removing and installing:

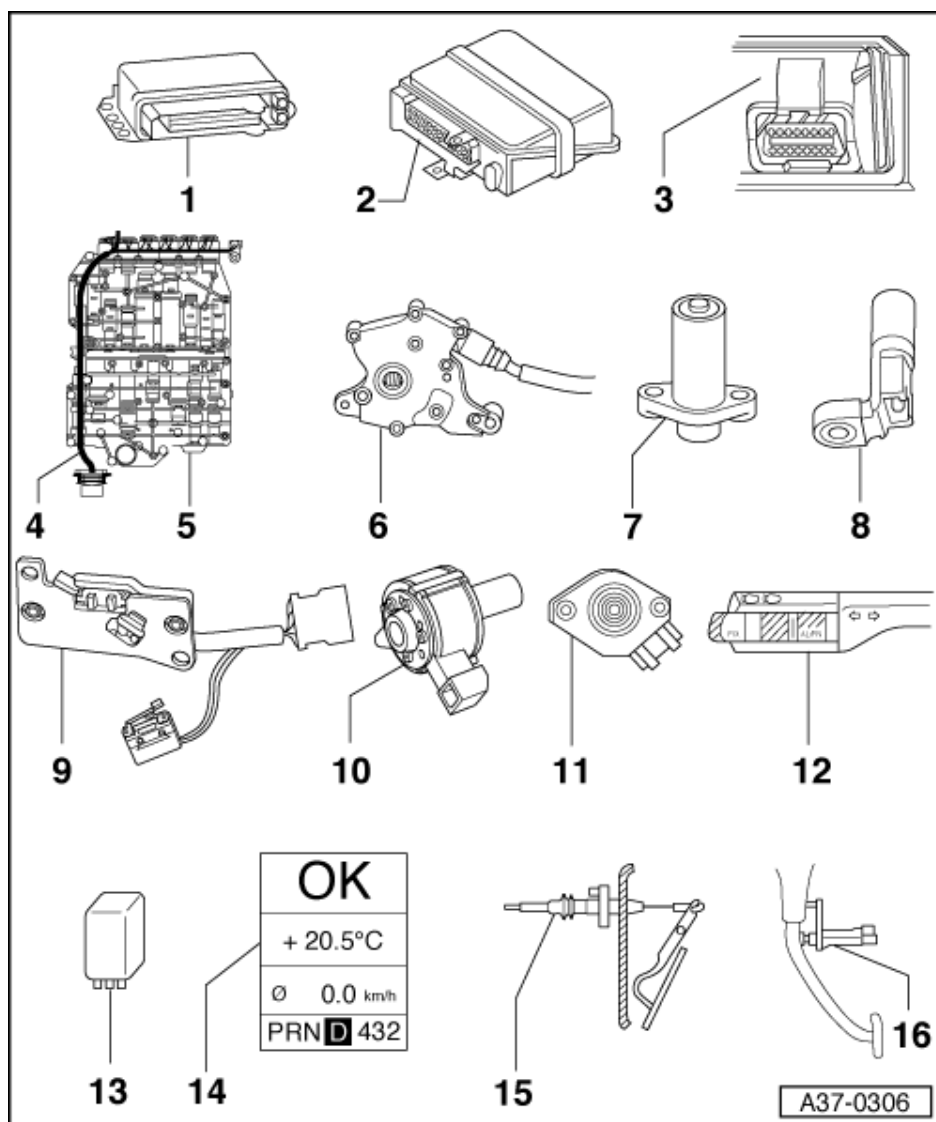
=> Electrical System; Repair group 94; Servicing steering column switch Servicing steering column switch

- ◆ May be checked with electrical test => Page **136**

13 Starter inhibitor relay -J207

- ◆ Fitting location => Fig. **19**

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

**14 Selector lever position indicator -Y6**

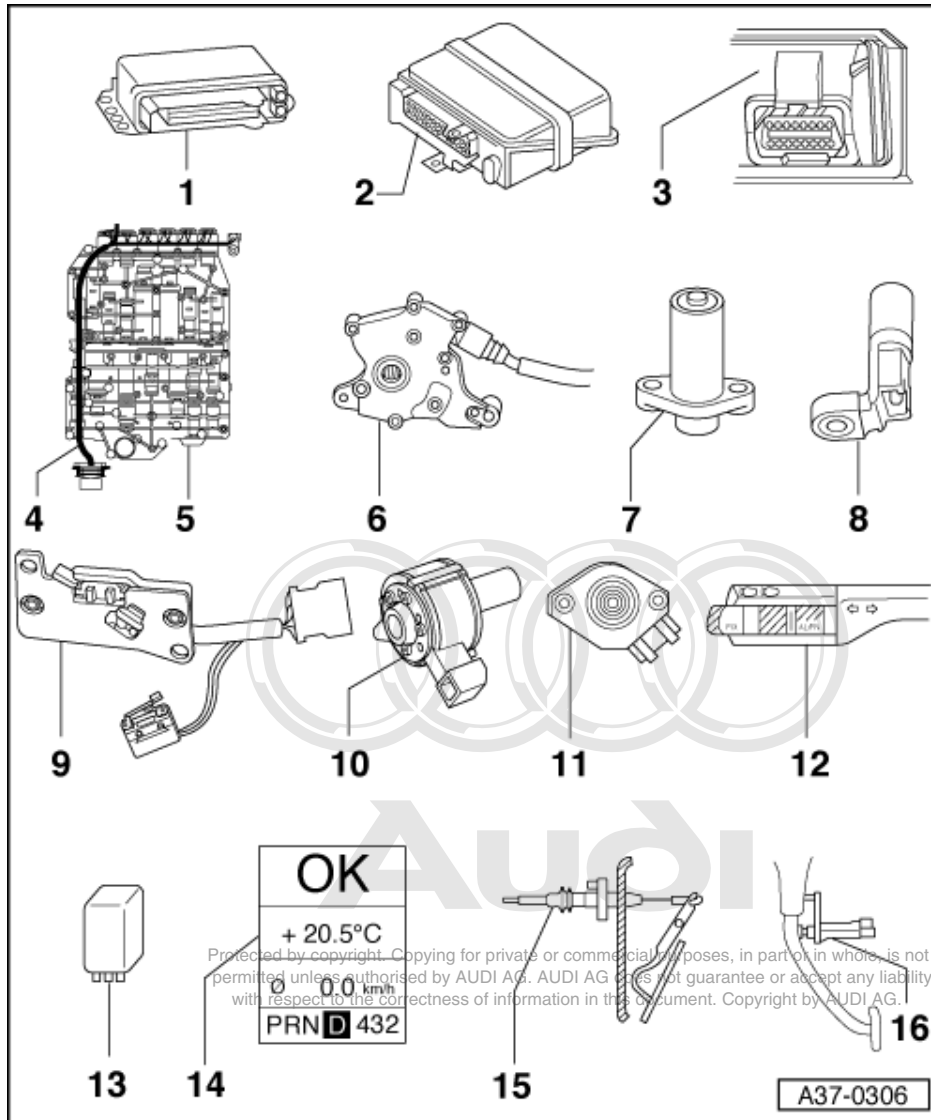
- ♦ Fitting location => Fig. 19
- ♦ If selector lever position indicator does not light up, this indicates that gearbox is in emergency running mode with gearbox control unit inactive.
- ♦ If all segments of selector lever position indicator light up together, this indicates that gearbox is in emergency running mode with gearbox control unit active.

15 Kickdown switch -F8

- ♦ Fitting location => Fig. 19
- ♦ Can be checked in measured value block => Page 136



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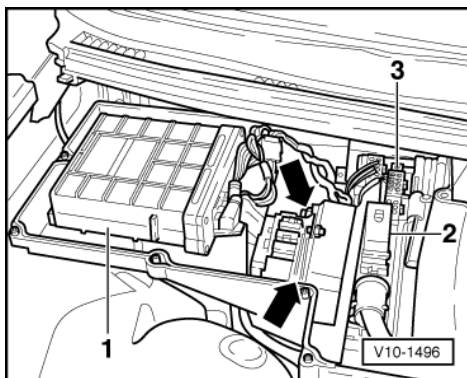


16 Brake light switch -F

- ♦ Fitting location => Fig. 20
- ♦ Removing and installing

=> Running Gear; Repair group 46; Removing and installing pedal cluster; Servicing pedal cluster Removing and installing pedal cluster Servicing pedal cluster

- ♦ Can be checked in measured value block => Page 136





-> Fig.1 Fitting location of automatic gearbox control unit -J217

Control unit is located in electronics box in front/right of plenum chamber.

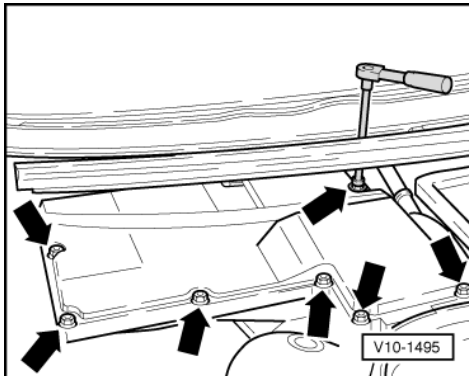
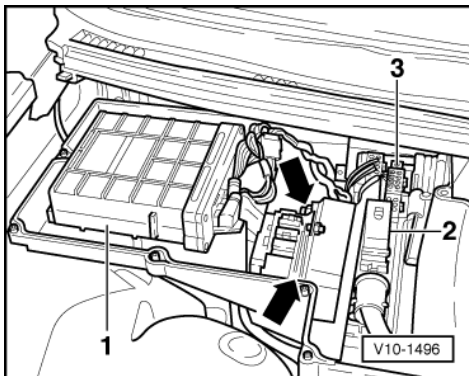


Fig.2 Removing and installing control unit for automatic gearbox -J217

Removing

- Switch off the ignition.
- -> Open electronics box in plenum chamber front/right. Unscrew 7 bolts -arrows-. Unclip bore cover for bolt (top right of illustration).

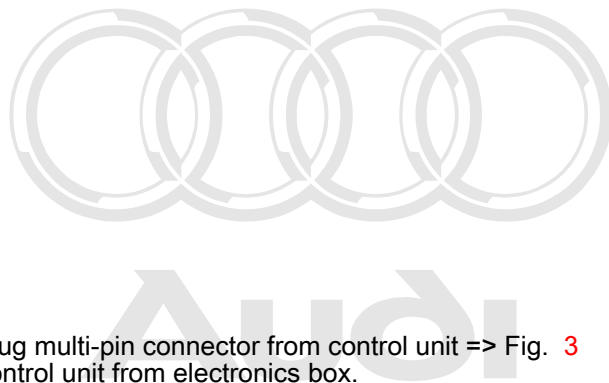
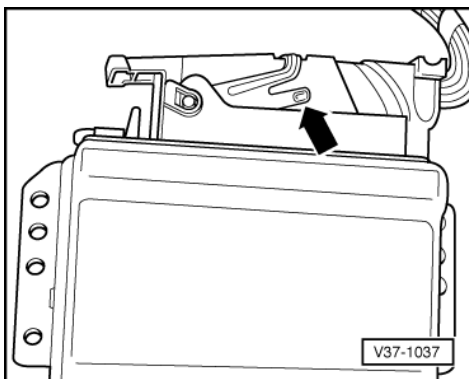


- -> Unlock multi-pin connector -2- and then unplug multi-pin connector from control unit => Fig. 3
- Unscrew bolts -arrows- and remove gearbox control unit from electronics box.
- Check container for water leaks and seal, if necessary.

Installation:

Install in reverse order. Additionally, the following operational steps must be followed:

- Interrogate fault memory of gearbox control unit => Page 21 .

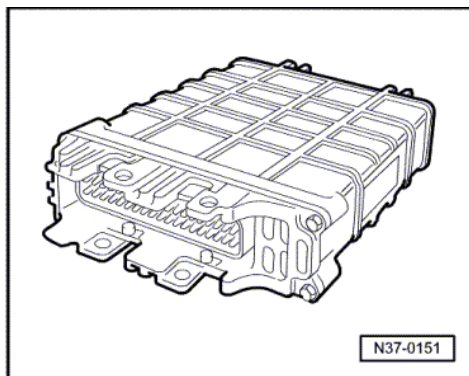


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-> **Fig.3 Disconnect control unit for automatic gearbox -J217 from multi-pin connector**

- Switch off ignition and wait approx. 30 seconds.
- To unlock connector press lock in direction of arrow.

Install in reverse order.



-> **Fig.4 Engine control unit**

Fitting location: Control unit is located in plenum chamber on right in electronics box.

Removing and installing control unit

The procedure for removing and installing the control unit is described in the corresponding engine workshop manual in Repair group 01, 23 or 24.

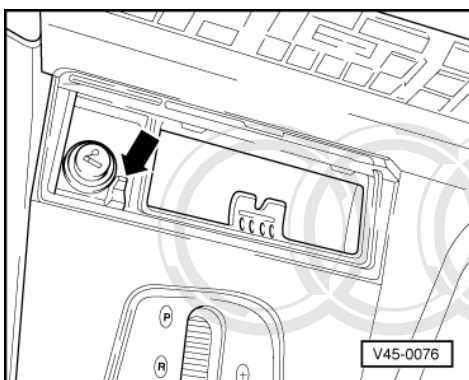


Fig.5 Diagnostic connector

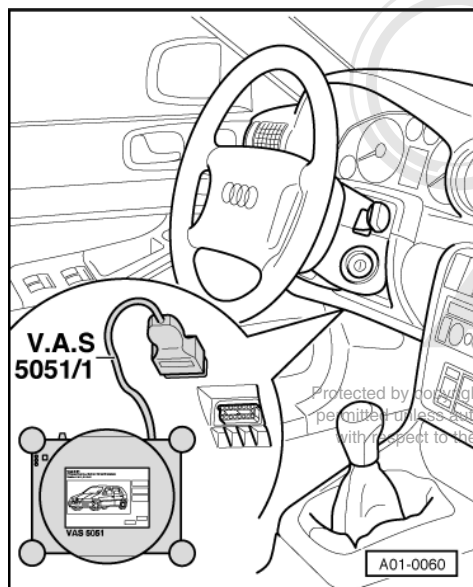
For vehicles up to model year 2000

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Fitting location: respect to the correctness of information in this document. Copyright by AUDI AG.

-> Diagnostic connector is located beneath cover in ashtray on vehicles up to model year 2000.

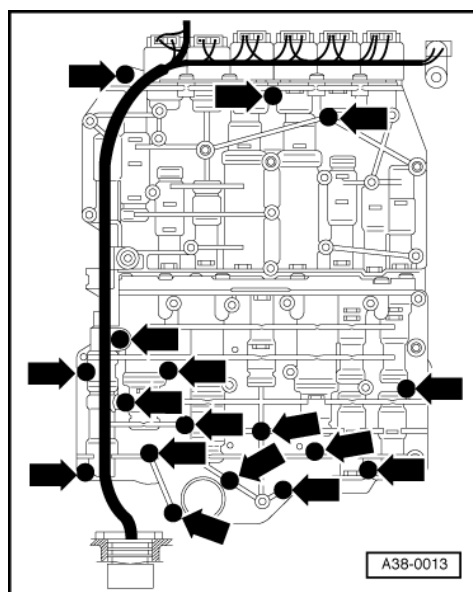
- -> Release ashtray -arrow- and remove from centre console.
- Remove cover for diagnostic connector.



For vehicles as of model year 2000

Fitting location:

-> As of model year 2000 diagnostic connector is located below knee bolster to left of steering wheel.



-> Fig.6 Valve body

Fitting location: The valve body is bolted to the underside of gearbox housing inside the oil pan.

The solenoid valves -N88, -N89, -N90, -N91, -N92, -N93, -N94 are attached to the valve body. Solenoid valves -N91, -N92, -N93, -N94 are also referred to as automatic gearbox pressure control valves 1 (-N215), 2 (-N216), 3 (-N217) and 4 (-N218).

Removing and installing valve body

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body
Removing and installing valve body

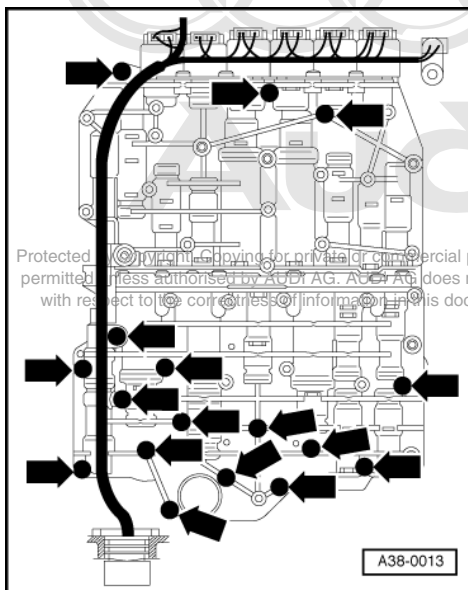
A distinction is made between two types of gearbox.

Gearbox with hydraulic control E17, in which gearbox input speed sender (inductive sender) is attached to underside of valve body.

Gearbox with hydraulic control E18/2, in which gearbox input speed sender (Hall sender) is attached to gearbox housing behind valve body.

Information on the gearbox concerned can be found in the following Workshop Manual under the Repair group quoted:

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment
Code letters, gearbox allocation, ratios, equipment



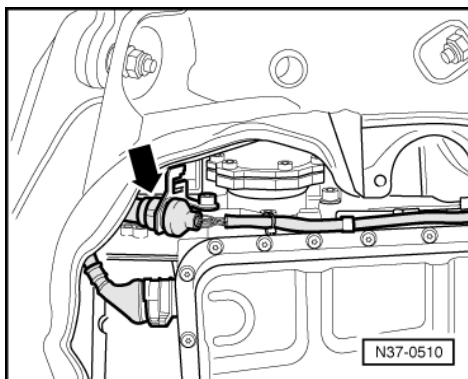
-> Fig. 7 Internal wiring harness in gearbox with integrated gearbox oil temperature sender (ATF) -G93

Fitting location: The wiring harness is attached to the valve body.

The wiring harness can be replaced with gearbox installed after removing the valve body.

Removing and installing wiring harness in gearbox

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox
Removing and installing oil pan, oil filter and valve body
Removing and installing wiring harness in gearbox





-> Fig.8 Multi-function switch -F125

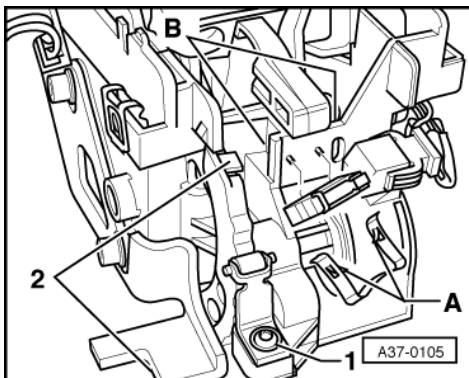
Fitting location: The multi-function switch is on the left of the gearbox; arrow shows connector for multi-function switch.

Two versions of multi-function switch are fitted:

1. Multi-function switch with 8-pin connector
2. Multi-function switch with 10-pin connector

Removing and installing multi-function switch

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Replacing multi-function switch Replacing multi-function switch

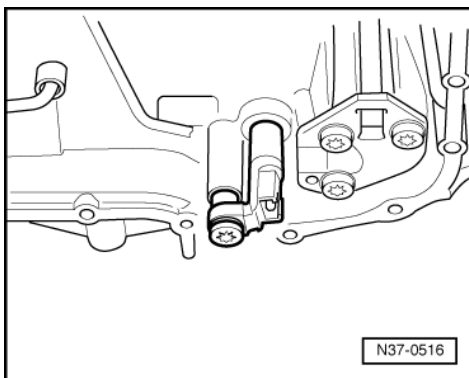


-> Fig.9 Switch for Tiptronic -F189

Fitting location: Switch for Tiptronic -F189 is located in the shift mechanism.

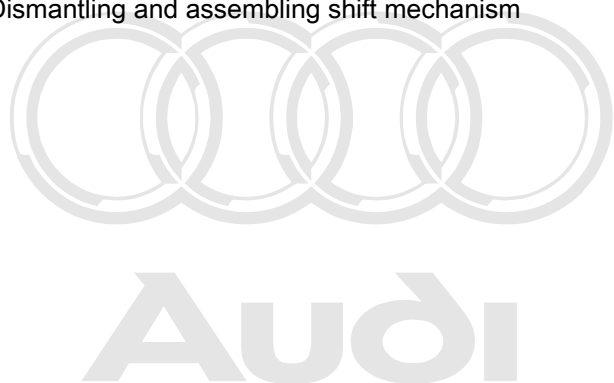
Removing and installing Tiptronic switch -F189

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism; Dismantling and assembling shift mechanism Servicing shift mechanism Dismantling and assembling shift mechanism



-> Fig.10 Gearbox speed sender -G38

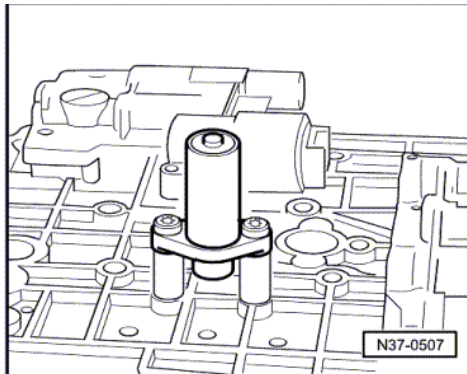
Fitting location: The gearbox speed sender is located at rear right of gearbox. It is also designated as gearbox output speed sender -G195.



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Removing and installing gearbox speed sender

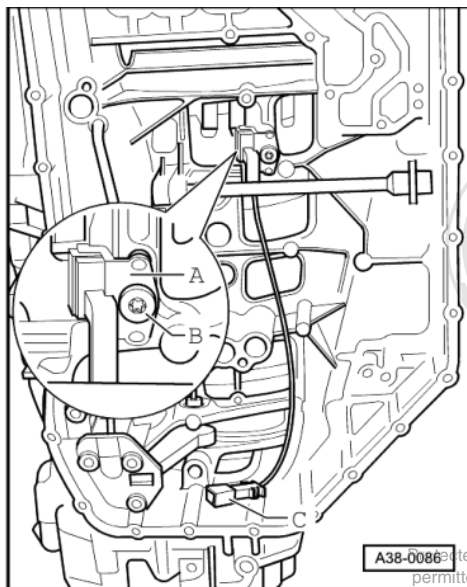
=> Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body; Replacing gearbox speed sender -G38 Removing and installing valve body Replacing gearbox speed sender -G38



-> Fig.11 Sender for gearbox input speed -G182

Fitting location:

In the case of gearboxes with hydraulic control E17, gearbox input speed sender is located on underside of the valve body (see Fig.). In such cases the sender is of the inductive type.



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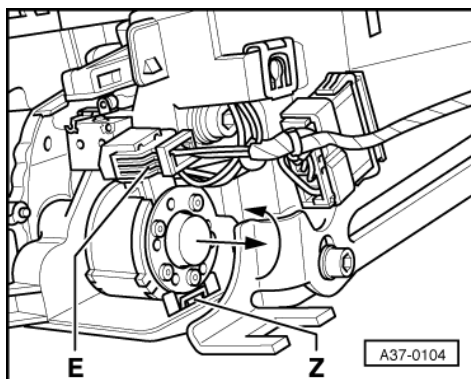
-> In the case of gearboxes with hydraulic control as of E18/2, gearbox input speed sender -A- is attached to the gearbox housing behind the valve body. In these cases the sender is a Hall sensor.

Information on the gearbox concerned can be found in the following Workshop Manual under the Repair group quoted:

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

**Removing and installing gearbox input speed sender**

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body; Replacing gearbox input speed sender -G182 Removing and installing valve body Replacing gearbox input speed sender -G182

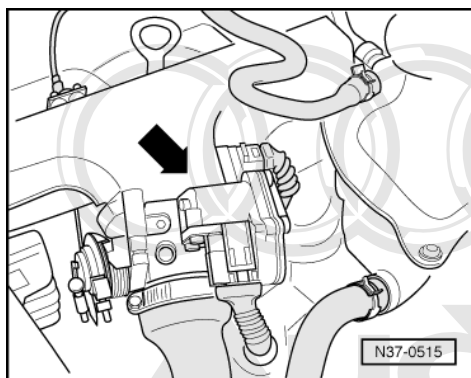


-> Fig.12 Solenoid for selector lever lock -N110

Fitting location: The selector lever lock solenoid is located in the shift mechanism -arrow-.

Removing and installing the selector lever lock solenoid

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism



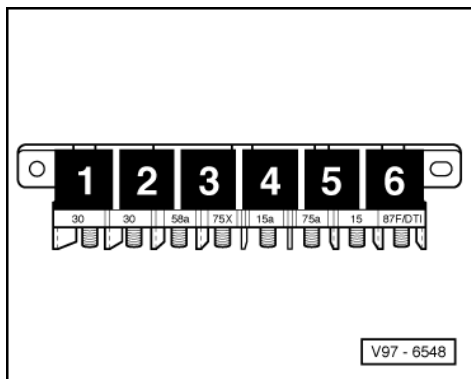
-> Fig.13 Throttle valve potentiometer -G69

Fitting location in vehicles with petrol engine: Integrated in throttle valve control part -J338 (arrow).

The fitting location is described in the corresponding engine workshop manual in Repair group 01, 23 or 24.

Note:

Function of throttle-valve potentiometer is assumed by accelerator (pedal) position sender (-G79, -G185) on TDI engines and engines with electronic throttle.

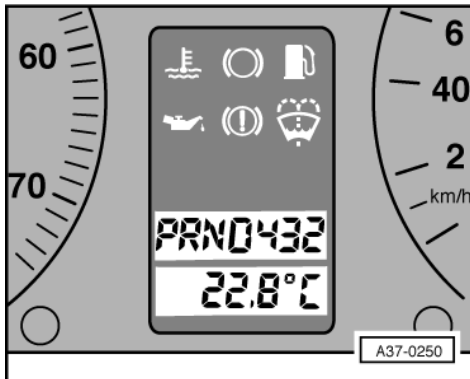


-> **Fig.14 Relay for starter inhibitor -J207**

Fitting location: Relay is located on central electrics.

Assignment

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations

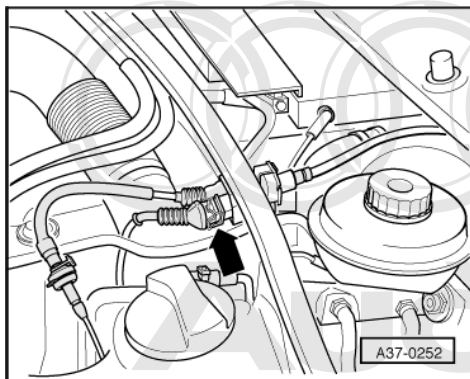


-> **Fig.15 Selector lever position indicator -Y6**

Fitting location: In dash panel insert

Removing and installing selector lever position indicator

=> Electrical System; Repair group 90; Servicing dash panel insert Servicing dash panel insert



-> **Fig.16 Kickdown switch -F8**

Fitting location on petrol engines without electronic throttle:

Behind flashback in plenum chamber, integrated into throttle cable -arrow-.

Fitting location on TDI engines and engines with electronic throttle:

In accelerator pedal stop

=> Fuel Supply - Petrol Engines; Repair group 20

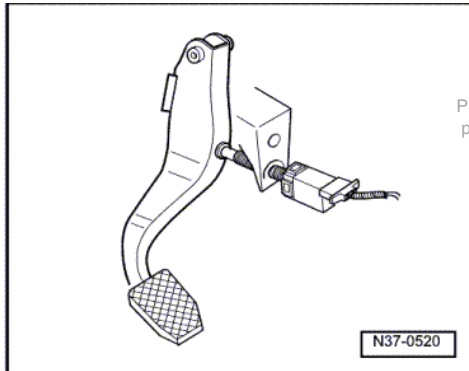


=> Fuel Supply - Diesel Engines; Repair group 20

Removing and installing kickdown switch

=> Fuel Supply - Petrol Engines; Repair group 20

=> Fuel Supply - Diesel Engines; Repair group 20



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-> Fig.17 Brake light switch -F

Fitting location: Brake light switch (arrow) is located on pedal cluster.

Removing and installing brake light switch

=> Running Gear; Repair group 46; Removing and installing pedal cluster, Servicing pedal cluster Removing and installing pedal cluster, Servicing pedal cluster

Note:

On engines with electronic throttle, brake light signal is transmitted by way of CAN bus from engine control unit to gearbox control unit.

3 - Notes on tow-starting and towing

3.1 - Notes on tow-starting and towing

Important

When towing the vehicle, the selector lever must be in position N and the vehicle must be towed no further than 50 km and no faster than 50 km/h, otherwise the gearbox will be damaged.

Note:

If, for example, the battery is too weak or the starter is defective, tow-starting the vehicle engine is not possible.

4 - Performing self-diagnosis

4.1 - Performing self-diagnosis

Additionally required information

- ♦ Workshop Manual Audi A8 1994 ä; Automatic Gearbox 01V, FWD and 4WD
- ♦ "Current Flow Diagrams, Electrical Fault-finding and Fitting Locations" binder
- ♦ Technical Service Manual
- ♦ Replacement part catalogue

4.2 - Safety precautions

Note the following points if testers and measuring instruments have to be used during a road test:

Warning

- ♦ **Always install testers and measuring instruments on the back seat and have a second person operate them from there.**
- ♦ **If test equipment is operated from the front passenger seat, the person sitting there could be injured if the front passenger airbag were triggered in the event of an accident.**

To prevent injuries to persons and/or damage to the fuel injection and ignition system, the following must be noted:

- ♦ Always switch off the ignition before connecting or disconnecting measuring instruments and testers.
- ♦ In the case of some tests, a fault may be recognised and stored by the control unit. At the end of all tests and repairs, therefore, the fault memory should be interrogated and, if necessary, erased.
- ♦ Always switch off the ignition before connecting or disconnecting the battery, otherwise the engine control unit may be damaged.

4.3 - Connecting vehicle diagnostic, testing and information system VAS 5051 and selecting functions

Test requirements

- Selector lever in position "P" and handbrake applied.
- Supply voltage of vehicle electrical system OK
- Voltage supply and fuses for the relevant systems OK.

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

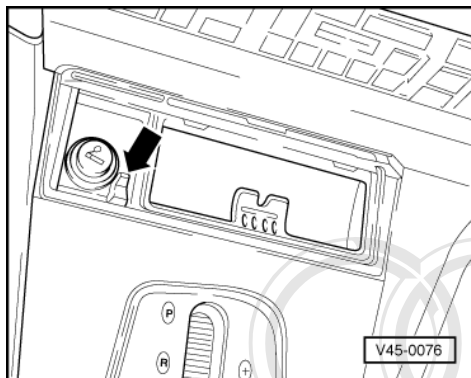
- Earth connections and earth point for gearbox OK.

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

- Check earth connections for corrosion and damaged connections and repair, if necessary.
- Check battery earth cable and earth cable between battery and gearbox.

Procedure

- Switch ignition off.



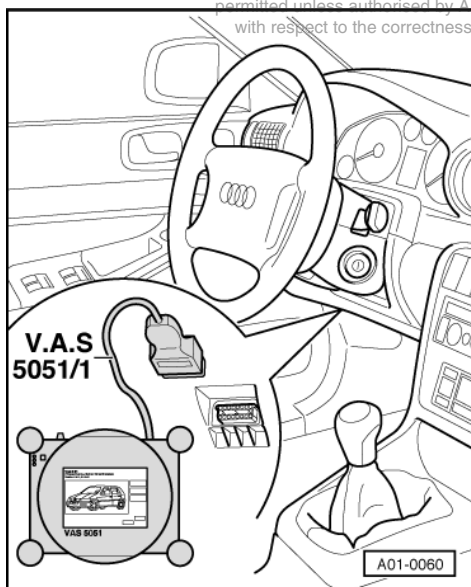
For vehicles up to model year 2000

Fitting location:

-> Diagnostic connector is located beneath cover in ashtray on vehicles up to model year 2000.

- -> Release ashtray -arrow- and remove from centre console.
- Remove cover for diagnostic connector.

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For vehicles as of model year 2000

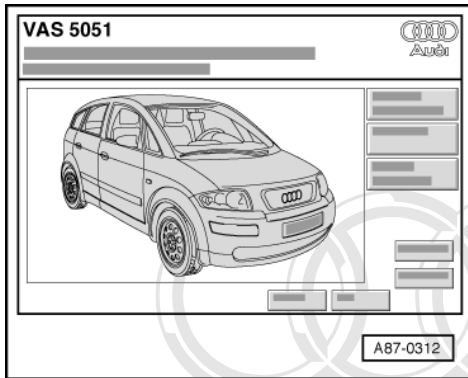
-> As of model year 2000, diagnostic connector is located below knee bolster to left of steering wheel.

For all vehicles:

- -> Connect up vehicle diagnostic, testing and information system VAS 5051 with diagnostic wire VAS 5051/1.

Important

- ♦ **When driving the vehicle for measurement and test purposes, always secure the vehicle diagnostic, testing and information system VAS or fault reader V.A.G**
- ♦ **Observe the safety precautions =>**



Note:

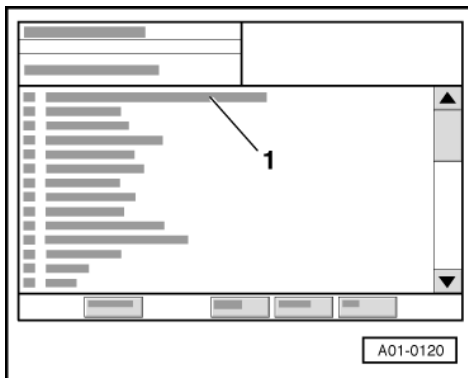
If a fault message appears in the display:

=> Operating instructions for vehicle diagnostic, testing and information system VAS 5051

- Switch the ignition on.

-> Display on VAS 5051:

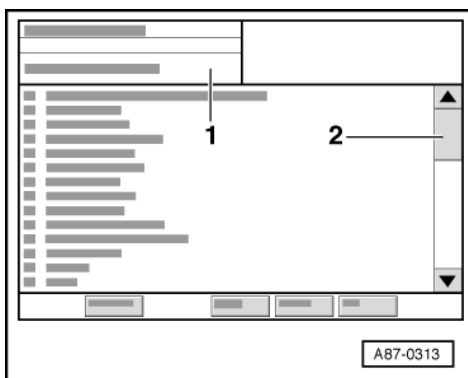
- Press the "vehicle self-diagnosis" key.



-> Display on VAS 5051:

Note:

The automatic test sequence is carried out by pressing "00 - Interrogate fault memory - whole system" under -1-, i.e. the fault memories of all vehicle systems with self-diagnosis capability are interrogated.

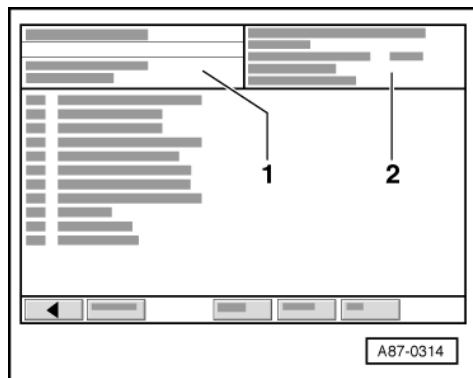




- -> Select vehicle system "02- Gearbox electronics".

Notes:

- ♦ The prompt for selection of a vehicle system appears in display zone -1-.
- ♦ Vehicle systems (for all vehicle types and equipment) can be displayed by "scrolling" down the screen display with scroll bar -2-.
- Wait until the next display appears.



-> Display on VAS 5051:

- 2 - Control unit identification of gearbox control unit => Page 24 .

If display "vehicle system not available" appears in display zone -1- of the VAS 5051's display, check:

- Power supply to diagnostic connector according to current flow diagram.
- Wiring from diagnostic connector to control unit.

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

- Check supply voltage of control unit, carry out test step 1 => Page 136 , Electrical test.

Gearbox control unit identification (example)	
02 - Gearbox electronics	Vehicle system
4D0927156BT	Part-No.; assignment => Parts List
AG5 01V1)2.8l5V2)RoW3)14164)	1) Automatic gearbox (5-gear) 01V 2) Engine version: 6-cylinder 2.8l / 5-valve 3) Market - "Rest of the world" 4) Control unit data status (software type)
Code 1	Coding of control unit => Page 80
Dealership No. 12345	Workshop Code of VAS 5051 with which encoding was last performed



- -> You now have the option of selecting between the following diagnostic functions -1-:

4.4 - Overview of function selection

All other displayed diagnostic functions cannot be selected or are not relevant here.

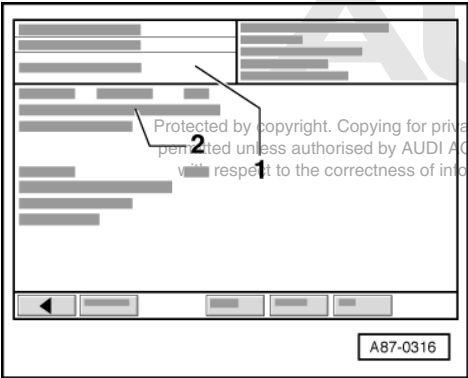
Diagnostic functions	Page
02 Interrogating fault memory	25
03 Final control diagnosis	70
05 Erasing fault memory	77
06 End of output	79
07 Encoding control unit	80
08 Reading measured value block	85

5 - Interrogating fault memory

5.1 - Interrogating fault memory



- Connect the vehicle diagnostic, testing and information system VAS 5051 => Page 21 and select vehicle system "02 - Gearbox electronics". For this purpose, the ignition must be switched on.
- > Display on VAS 5051:
- Under -1- select diagnostic function "02 - Interrogate fault memory".





-> Display on VAS 5051:

- 1 - Content of the fault memory:
 - 0 faults recognised
 - or
 - X faults recognised
- 2 - Faults
 - fault code
 - fault location
 - type of fault

A - if faults were recognised:

- Print out the screen contents or the self-diagnosis report.
- End function "02 - Interrogate fault memory" by pressing the ◀ key.



-> Display on VAS 5051:

- After display and print out of the last fault the faults must be erased according to fault table => from Page 26 .
- Select diagnostic function "02 - Interrogate fault memory" in selection -1- again and erase the fault memory => Page 77 .
- Under -1- select diagnostic function "06 - End output" => Page 79 .

B - if no fault was recognised:

- End function "02 - Interrogate fault memory" by pressing the ◀ key.
- Select diagnostic function "06 - End output" => Page 79 .

6 - Fault table

6.1 - Fault table

6.2 - Important tips:

- ♦ Listed below are all possible faults that are recognised by the automatic gearbox control unit -J217 and displayed on the VAS 5051 when the fault memory content is interrogated.
- ♦ The fault table is sorted according to the 5-digit fault code on the left.
- ♦ The content of the fault memory is retained until the next erase operation, Erase fault memory => Page 77 .
- ♦ 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 => Fault recognition of gearbox control unit, Page 1 .

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- ◆ Do not immediately renew components indicated as faulty by the VAS 5051 but first check the wiring and connectors of these components against the current flow diagram. Also check the earth connections against current flow diagram. This is particularly relevant for faults recorded as "sporadic".

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

7 - Part 1, up to fault code 00638 / P1767

7.1 - Part 1, up to fault code 00638 / P1767

Output on VAS 5051	
No fault detected!	If "No fault detected!" appears on display after repair self-diagnosis is completed. If the automatic gearbox does not function properly even though self-diagnosis is OK: Perform final control diagnosis => Page 85

Output on VAS 5051	Possible causes of fault	Fault remedy
00258 P0753 Solenoid valve 1 -N88 Open circuit/short to earth 1) Short to positive 1)	Open circuit or short circuit to earth/positive Solenoid valve 1 -N88 defective	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 005 3) - Perform final control diagnosis =>Page 136

- 1) One of these displays appears in addition to component concerned.
- 2) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

Notes on fault recognition of fault code 00258 / P0753:

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

Output on VAS 5051	Possible causes of fault	Fault remedy
00260 P0758 Solenoid valve 2 -N89 Open circuit/short to earth 1) Short to positive 1)	Open circuit or short circuit to earth/positive Solenoid valve 2 -N89 defective	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 005 3) - Perform final control diagnosis =>Page 136

- 1) One of these displays appears in addition to component concerned.
- 2) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

**Notes on fault recognition of fault code 00260 / P0758:**

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

Output on VAS 5051	Possible causes of fault	Fault remedy
00262 P0763 Solenoid valve 3 -N90 Open circuit/short to earth 1) Short to positive 1)	Open circuit or short to earth Solenoid valve 3 -N90 defective	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 005 3) - Perform final control diagnosis =>Page 136

- 1) One of these displays appears in addition to component concerned.
- 2) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Notes on fault recognition of fault code 00262 / P0763:

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

Output on VAS 5051	Possible causes of fault	Fault remedy
00264 P1813 Solenoid valve 4 -N91 Open circuit/short to earth 1) Short to positive 1)	Open circuit or short to earth Solenoid valve 4 -N91 defective	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 006 3) - Perform final control diagnosis =>Page 136

- 1) One of these displays appears in addition to component concerned.
- 2) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
00266 P1818 Solenoid valve 5 -N92 Open circuit/short to earth 1) Short to positive 1)	Open circuit or short to earth Solenoid valve 5 -N92 defective	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 006 3) - Perform final control diagnosis =>Page 136
00268 P1823 Solenoid valve 6 -N93	Open circuit or short to earth Solenoid valve 6 -N93 defective	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 006 3)

Open circuit/short to earth 1) Short to positive 1)		- Perform final control diagnosis =>Page 136
--	--	--

Footnotes and notes on fault code 00266 / P1818 and 00268 / P1823 can be found on next page.

- 1) One of these displays appears in addition to component concerned.
- 2) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
00270 P1828 Solenoid valve 7 -N94 Open circuit/short to earth 1) Short to positive 1)	Open circuit or short to earth Solenoid valve 7 -N94 defective	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 007 3) - Perform final control diagnosis =>Page 136

- 1) One of these displays appears in addition to component concerned.
- 2) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
00293 P0705 Multi-function switch -F125 Implausible signal	Open circuit or short circuit to earth or positive Voltage supply of multi-function switch is interrupted. Multi-function switch -F125 defective Connector for multi-function switch unplugged	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 004 2) - Carry out electrical test => Page 136 If necessary, replace multi-function switch -F125 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Replacing multi-function switch -F125 Replacing multi-function switch -F125

- 1) First check 8-pin connectors for contact corrosion and water damage and replace, if necessary.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
00296 P1704 Kickdown switch -F8	Short circuit to earth between -F8 and gearbox control unit Open circuit between -F8 and gearbox control unit	- Check wiring and connectors according to current flow diagram - Read measured value block =>Page 85 ; Display group number 008 1)

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Short to earth	Kickdown switch -F8 defective	- Carry out electrical test => Page 136 Adjust or replace accelerator cable => Fuel Supply System - Petrol Engines; Repair group 20; Servicing throttle mechanism - front and four-wheel drive Servicing throttle mechanism - front and four-wheel drive
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1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Notes on fault code 00296 / P1704:

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

Output on VAS 5051	Possible causes of fault	Fault remedy
00297 P0722 Gearbox speed sender -G38	Open circuit or short circuit to earth or positive Screen for -G38 defective Gearbox speed sender -G38 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 136 Replace gearbox speed sender -G38 if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Replacing gearbox speed sender -G38 Replacing gearbox speed sender -G38
No signal	Engine/gearbox input speed signal is incorrect ATF level not OK Defective or incorrect converter Continued ▼	- Carry out fault remedy according to fault code 00529, 17101 - Check ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/ changing ATF Checking/changing ATF Check converter code

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

Output on VAS 5051	Possible causes of fault	Fault remedy
00297 P0722 Gearbox speed sender -G38 No signal	(Fault 00297 continued) Slipping of clutches/brakes or solenoid valve defective	Read measured value block, display group numbers 004 to 006 1) =>Page 85 and during driving operation, establish which elements are defective/not activated

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Notes on fault recognition of fault code 00297 / P0722:

- The fault recognition process also includes a plausibility check: Ratio of gearbox output speed to engine speed and gearbox input speed with gear engaged implausible. (Test requirement: A definite forward gear must be engaged; selector lever must not be in P, N or any intermediate positions and gearshift must have been completed.)

Output on VAS 5051	Possible causes of fault	Fault remedy
00300 P0712 Gearbox oil temperature sender -G93 Short to earth 1)	Open circuit/short circuit	- Check wiring and connectors according to current flow diagram 3) Read measured value block =>Page 85 ; Display group number 004 4) - Carry out electrical test => Page 136 Check ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF
00300 P0713 Gearbox oil temperature sender -G93 Open circuit/short to positive 2)	Gearbox oil temperature sender -G93 defective ATF level not OK 2)	Gearbox oil temperature sender -G93 is integrated into internal gearbox wiring harness

- 1) Additional fault recognition: if ATF temperature detected is below - 50 °C.
- 2) Additional fault recognition: if ATF temperature detected is above - 180 °C.
- 3) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 4) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

Fault code 00518 / P0121 for vehicles with CAN bus A) (for vehicles with no CAN bus => see next fault):

Output on VAS 5051	Possible causes of fault	Fault remedy
00518 P0121 -G69 throttle valve potentiometer	Fault in throttle flap potentiometer - G69 diagnosed by engine control unit Wiring connection between throttle valve potentiometer and engine control unit defective	- Read measured value block =>Page 85 ; Display group number 008 and 009 1) Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Wrong or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

Footnotes and notes on fault code 00518 / P0121 (for vehicles with CAN bus) can be found on next page.

- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Notes on fault code 00518 / P0121 for vehicle models with CAN bus A):

- ♦ The signal from throttle valve potentiometer -G69 is transmitted from the engine control unit to the gearbox control unit via the CAN bus line.



- ♦ Conditions of fault recognition: The fault in the component concerned is diagnosed by the engine control unit. This fault diagnosis is sent to the engine control unit via the CAN bus-line.
- ♦ Fault code 00518 / P0121 for vehicles with no CAN bus => refer to next fault

Fault code 00518 / P0121 for vehicles with no CAN bus A) (for vehicles with CAN bus => see preceding fault):

Output on VAS 5051	Possible causes of fault	Fault remedy
00518 P0121 -G69 throttle valve potentiometer	Loose contact or short circuit between engine and gearbox control unit	- If fault 00638 is also displayed, this is to be remedied first Check wiring and connectors according to current flow diagram Read measured value block =>Page 85 ; Display group number 008 and 009 3)
Signal too small 1) Signal too large 1) Implausible signal 1) 2)	Wiring connection between throttle valve potentiometer -G69 and engine control unit defective -G69 throttle valve potentiometer defective No signal being sent from engine control unit, or signal is incorrect	- Fault remedy according to fault code 16504, 16505, 16506 and 16507 of engine control unit - Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis

Footnotes and notes on fault code 00518 / P0121 (for vehicles with no CAN bus) can be found on next page.

- 1) One of these displays appears in addition to component concerned.
- 2) For vehicles with Motronic fuel-injection and ignition systems, the only type of fault is "implausible signal".
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Notes on fault code 00518 / P0121 for vehicle models with no CAN bus A):

- ♦ Signal is transmitted in digital form from throttle valve potentiometer -G69 via engine control unit to gearbox control unit.
- ♦ In the case of fault code 00518 / P0121 fault detection by gearbox control unit is much more sensitive than fault detection by engine control unit. This means that a brief interruption in the throttle valve signal (up to 1 second) is not detected by the engine control unit but is registered as a fault by the gearbox control unit.
- ♦ Conditions of fault recognition: Frequency of digital signal to gearbox control unit outside permissible tolerance (signal pulse must occur at least every 30 ms).
- ♦ Fault code 00518 / P0121 for vehicles with CAN bus => refer to preceding fault.

Output on VAS 5051	Possible causes of fault	Fault remedy
00526 P0703	Brake light switch -F defective	- Check wiring and connectors according to current flow diagram
Brake light switch -F	Open circuit or short to earth/positive between gearbox control unit and brake light switch -F	- Read measured value block =>Page 136
Implausible signal		- If necessary, replace brake light switch -F

- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Note on fault code 00526 / P0703:

- ♦ The fault is preset when switching on ignition and is erased after one-off operation of brake pedal when brake light switch -F is OK.
- ♦ Before interrogating fault memory briefly operate brake pedal in order to erase pre-set fault.

Fault code 00529 / P0727 for vehicles with CAN bus A) (for vehicles with no CAN bus => see next fault):

Output on VAS 5051	Possible causes of fault	Fault remedy
00529 P0727	Fault in engine speed sender -G28 detected by engine control unit	- Read measured value block =>Page 85 ; Display group number 001 1) Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
Speed information missing (engine speed)	Incorrect or defective engine control unit <small>Protected by copyright. Copying for private or commercial purposes, or part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept liability with respect to the correctness of information.</small>	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Wrong or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

Footnotes and notes on fault code 00529 / P0727 (for vehicle models with CAN bus) can be found on next page.

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Notes on fault code 00529 / P0727 for vehicle models with CAN bus:

- ♦ The engine speed signal is transmitted from the engine control unit to the gearbox control unit via the CAN bus line.
- ♦ Conditions of fault recognition: The fault in the component concerned is diagnosed by the engine control unit. This fault diagnosis is sent to the engine control unit via the CAN bus-line.

Fault code 00529 / P0727 for vehicles with no CAN bus A) (for vehicles with CAN bus => see preceding fault):

Output on VAS 5051	Possible causes of fault	Fault remedy
00529 P0727	Open circuit in wiring between engine and gearbox control unit	- Check wiring and connectors according to current flow diagram
Speed information missing (engine speed)	Engine speed signal is interrupted by wrongly laid electric line (e.g. retrofitting of telephone)	- Read measured value block =>Page 136
Open circuit/short to earth 1) Short to positive 1) Implausible signal 1)	Signal from engine speed Sender to engine control unit faulty Engine speed Sender -G28 defective Engine control unit defective Short circuit to earth/positive Short circuit in on-board computer	- Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis



Footnotes and notes on fault code 00529 / P0727 (for vehicles with no CAN bus) can be found on next page.

- 1) One of these displays appears in addition to component concerned.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Notes on fault code 00529 / P0727 for vehicle models with no CAN bus A):

- ♦ In the case of fault code 00529 / P0727 fault detection by gearbox control unit is much more sensitive than fault detection by engine control unit. This means that a brief interruption in the engine speed signal (up to 1 second) is not detected by the engine control unit but is registered as a fault by the gearbox control unit.
- ♦ Fault recognition for fault code 00529 / P0727 is based on a plausibility check with regard to the consumption signal (or if this is not available, with regard to the throttle valve value)
- ♦ Conditions of fault recognition: Multi-function switch -F125 OK, consumption signal or throttle valve signal OK, value detected for gearbox speed greater than 200 rpm and no engine speed signal at gearbox control unit for 200 ms.

Output on VAS 5051	Possible causes of fault	Fault remedy
00532 P1746	Vehicle voltage less than 9 V	- Check and, if necessary, repair electrical system
Power supply (control unit, solenoid valves)	Fuse defective Supply voltage for solenoid valves or gearbox control unit (terminal 15) less than 9 V or greater than 16 V. Supply voltage applied even with ignition off, i.e. short to positive	- Read measured value block =>Page 85 ; Display group number 003 3) Check supply voltage to gearbox control unit -J217 Check wires and connections according to current flow diagram
Signal too small 1) 2) Output not switched/short to earth1) Output not switched/short to positive1)	Open circuit in wiring or short circuit of terminals 52, 53, 54 or 55 of control unit -J217	- Carry out electrical test => Page 136

- 1) One of these displays appears in addition to component concerned.
- 2) Fault recognition condition: Engine speed in excess of 1600 rpm.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

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Output on VAS 5051	Possible causes of fault	Fault remedy
00543 P0726	Open circuit	- Check wiring and connectors according to current flow diagram
Maximum revs exceeded2) (engine speed)	Engine speed signal is interrupted by wrongly laid electric line (e.g. retrofitting of telephone) Signal from engine speed Sender to engine control unit faulty Engine speed Sender -G28 defective	- Read measured value block =>Page 85 ; Display group number 001 1) Fault remedy according to fault code 16706 of engine control unit

	Engine speed limiter function defective Engine control unit defective Continued ▼	- Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
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- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".
- 2) For notes and fault recognition conditions, See fault code 00529/ P0727 (no speed information)

Output on VAS 5051	Possible causes of fault	Fault remedy
00543 P0726 Maximum revs exceeded2) (engine speed)	(Fault 00543 continued) Impermissible downshift of gearbox (e.g. through mechanically defective valve body)	Read measured value block, display group numbers 005 1) =>Page 85 and during driving operation, establish which elements are defective/not activated If necessary, replace solenoid valves or valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body Removing and installing oil pan, oil filter and valve body

- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".
- 2) For notes and fault recognition conditions, See fault code 00529/ P0727 (no speed information)

Output on VAS 5051	Possible causes of fault	Fault remedy
00545 P0702 Engine/gearbox electrical connection (modulation of ignition timing) Connector	Open circuit or short	- Check wiring and connectors according to current flow diagram
00545 P1781 Engine/gearbox electrical connection (modulation of ignition timing) Open circuit / short to Earth	No connection between engine/gearbox control unit and pin 20	- Read measured value block =>Page 85 ; Display group number 004 1)
00545 P1782 Engine/gearbox electrical connection (modulation of ignition timing) Short to positive	Ignition was switched on with engine control unit disconnected. Engine control unit defective	- Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary

Footnotes and notes on fault code 00545 / P0702 can be found on next page.

- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page **85** => under "Reading measured value block".

Note on fault recognition for fault code 00545 / P0702 (only for fault type "Connector"):

- ♦ Test requirements: Throttle valve and consumption signal not detected by gearbox control unit. Gearbox input speed registered greater than 2000 rpm.



- ♦ This fault can only occur on model versions without CAN bus A)

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Output on VAS 5051	Possible causes of fault	Fault remedy
00549 Fuel consumption signal Short to earth 1) Open circuit/short to positive 1) Implausible signal 1) 2)	Loose contact in wiring between engine and gearbox control unit Short circuit in on-board computer Open circuit/short to earth or positive between engine and gearbox control unit (to pin 35) Short circuit in wiring between engine control unit and on board computer Engine control unit defective	- Check wiring and connectors according to current flow diagram Check on-board computer - Read measured value block =>Page 136 - Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary

1) One of these displays appears in addition to component concerned.

2) Fault recognition condition: Engine speed and throttle valve signal OK and consumption signal not detected by gearbox control unit for 200 ms.

3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Notes on fault code 00549 can be found overleaf.

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- ♦ This fault can only occur on model versions without CAN bus A)

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Output on VAS 5051	Possible causes of fault	Fault remedy
00638 P0702 Engine/gearbox electrical connection 2 Open circuit/short circuit to positive	Open circuit or short circuit to positive Short to earth No connection between engine/gearbox control unit (to pin 41)	- Check wiring and connectors according to current flow diagram Read measured value block =>Page 85 ; Display group number 009 1)
00638 P1767 Engine/gearbox electrical connection 2 Short to earth	Throttle valve signal not transmitted to gearbox control unit	- Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary

Output on VAS 5051	Possible causes of fault	Fault remedy
	Connector unplugged	- Carry out electrical test => Page 136

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Note on fault codes 00638 / P0702 and 00638 / P1767:

♦ This fault can only occur on model versions without CAN bus A)

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

8 - Part 2, up to fault code 17106 / P0722

8.1 - Part 2, up to fault code 17106 / P0722

Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0732	Engine speed, gearbox input speed or gearbox speed not OK	- Remedy fault in line with fault code 17116 / P0732, 00529 / P0727 or 00297 / P0722
Gear monitoring	ATF level not OK Defective or incorrect converter	- Checking and topping up ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF Checking/changing ATF Check converter code
Implausible signal	Slipping of clutch or brakes Valve body/solenoid valves defective Continued ▼	- Read measured value block, display group number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body Removing and installing oil pan, oil filter and valve body

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Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0732	(Fault 00652 / P0732 continued)	Check gearbox control unit identification =>Page 24
Gear monitoring	Incorrect gearbox control unit/engine control unit fitted	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Incorrect gearbox may have been fitted (gearbox code does not match engine version)	- Check gearbox code letters => Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

**Notes on fault recognition of fault code 00652 / P0732:**

- ♦ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged implausible. (fault recognition condition: Gearbox input speed and gearbox speed greater than 64 rpm, engine speed in excess of 1400 rpm)
- ♦ Implausibility of 2nd gear ratio is recognised by gearbox control unit.

Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0733 Gear monitoring	Engine speed, gearbox input speed or gearbox speed not OK ATF level not OK Defective or incorrect converter	- Remedy fault in line with fault code 17117 / P0733, 00529 / P0727 or 00297 / P0722 - Checking and topping up ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF Checking/changing ATF Check converter code
Implausible signal	Slipping of clutch or brakes Valve body/solenoid valves defective Continued ▼	- Read measured value block, display group number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body Removing and installing oil pan, oil filter and valve body

Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0733 Gear monitoring	(Fault 00652 / P0733 continued) Incorrect gearbox control unit/engine control unit fitted	Check gearbox control unit identification =>Page 24 - Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Incorrect gearbox may have been fitted (gearbox code does not match engine version)	- Check gearbox code letters => Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault recognition of fault code 00652 / P0733:

- ♦ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged implausible. (fault recognition condition: Gearbox input speed and gearbox speed greater than 64 rpm, engine speed in excess of 1400 rpm)
- ♦ Implausibility of 3rd gear ratio is recognised by gearbox control unit.

Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0734 Gear monitoring	Engine speed, gearbox input speed or gearbox speed not OK ATF level not OK Defective or incorrect converter	- Remedy fault in line with fault code 17118 / P0734, 00529 / P0727 or 00297 / P0722 - Checking and topping up ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF Checking/changing ATF Check converter code

Implausible signal	Slipping of clutch or brakes Valve body/solenoid valves defective Continued ▼	- Read measured value block, display group number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body Removing and installing oil pan, oil filter and valve body
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Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0734 Gear monitoring	(Fault 00652 / P0734 continued) Incorrect gearbox control unit/engine control unit fitted	Check gearbox control unit identification =>Page 24 - Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Incorrect gearbox may have been fitted (gearbox code does not match engine version)	- Check gearbox code letters => Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Notes on fault recognition of fault code 00652 / P0734:

- ♦ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged implausible. (fault recognition condition: Gearbox input speed and gearbox speed greater than 64 rpm, engine speed in excess of 1400 rpm)
- ♦ Implausibility of 4th gear ratio is recognised by gearbox control unit.

Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0735 Gear monitoring	Engine speed, gearbox input speed or gearbox speed not OK Multi-function switch defective	- Remedy fault in line with fault code 17119 / P0735, 00529 / P0727, 00297 / P0722 or 00293 / P0705
	ATF level not OK Defective or incorrect converter	- Checking and topping up ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF Checking/changing ATF Check converter code
Implausible signal	Slipping of clutch or brakes Valve body/solenoid valves defective Continued ▼	- Read measured value block, display group number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body Removing and installing oil pan, oil filter and valve body

Output on VAS 5051	Possible causes of fault	Fault remedy
00652 P0735 Gear monitoring	(Fault 00652 / P0735 continued) Incorrect gearbox control unit/engine control unit fitted	Check gearbox control unit identification =>Page 24



Implausible signal		- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
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1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault recognition of fault code 00652 / P0735:

- ♦ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged implausible. (fault recognition condition: Gearbox input speed and gearbox speed greater than 64 rpm, engine speed in excess of 1400 rpm)
- ♦ Implausibility of 5th gear ratio is recognised by gearbox control unit.

Output on VAS 5051	Possible causes of fault	Fault remedy
00668 P0560	Open circuit or short to earth	- Check wiring and connectors according to current flow diagram
Vehicle voltage terminal 30	Fuse defective	- Read measured value block =>Page 85 ; Display group number 003 1)
Open circuit/short to earth		- Carry out electrical test => Page 136

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Note on fault code 00668 / P0560:

- ♦ When the system voltage (term. 30) fails application values are lost, i.e. the engine control unit must be readapted to these values on restart. The switching quality may be lower than normal during this readaption process.
- ♦ Fault is only registered by self-diagnosis if it occurs five times in succession after switching ignition off/on.

Output on VAS 5051	Possible causes of fault	Fault remedy
01044 P1749 Control unit incorrectly encoded	Gearbox control unit recognises invalid coding in EEPROM => Control unit defective	- Check gearbox control unit identification =>Page 24

Output on printer V.A.G 1551	Possible causes of fault	Fault remedy
01045	Short to earth between up, down or manual gate switch	- Read measured value block =>Page 85 ; Display group number 011 1)
Switch for Tiptronic -F189	Short to earth in up, down or manual gate switch	- Carry out electrical test => Page 136
Short to earth		

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

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Note on fault code 01045:

- ♦ Only an implausible short to earth on contacts of gearbox control unit is diagnosed.

Output on printer V.A.G 1551	Possible causes of fault	Fault remedy
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01166 Engine torque signal	Fault in "signal for motor torque" diagnosed by engine control unit	- Read measured value block =>Page 85 ; Display group number 009 Read stored fault code of engine control unit and remedy fault.
	Incorrect or defective engine control unit	- Check engine control unit identification in self-diagnosis of engine control unit, if necessary replace engine control unit
Implausible signal	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

Note on fault code 01166:

- ♦ This fault can only occur on model versions with CAN bus A)
- ♦ Function of CAN-Bus => Page **131**
- ♦ The signal for the motor torque is sent to the gearbox control unit by the engine control unit via the CAN-Bus-line.
- ♦ Conditions of fault recognition: The fault in the component concerned is diagnosed by the engine control unit. This fault diagnosis is sent to the engine control unit via the CAN bus-line.

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Output on VAS 5051	Possible causes of fault	Fault remedy
01192 P0741	ATF level not OK Defective or incorrect converter	- Checking and topping up ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/ changing ATF Checking/changing ATF Check converter code
Clutch for converter bridging	Mechanical fault in solenoid valve - N94 ATF supply to solenoid valve -N94 not functioning properly Incorrect control unit fitted	- Read measured value block =>Page 24
Speed deviation too great	Electrical activation of solenoid valve -N94 defective	- Carry out fault remedy according to fault code 00270, P1828

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Notes on fault recognition of fault code 01192 / P0741:

- ♦ Ratio of gearbox speed and gearbox input speed to engine speed not plausible with torque converter lock-up clutch.

Output on VAS 5051	Possible causes of fault	Fault remedy
01196 P1625	The ignition was switched on with plug of gearbox control unit -J217 disconnected.	- Check connector of connection wiring from engine to gearbox control unit
Engine/gearbox-CAN Bus	Open circuit or short circuit between engine and gearbox control unit	- Carry out electrical test => Page 85 ; Display group number 008 and 009 1)
	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary



Implausible signal	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 3
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1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Notes on fault code 01196 / P1625:

- ♦ This fault can only occur on model versions with CAN bus
- ♦ Function of CAN-Bus => Page **131**

Output on VAS 5051	Possible causes of fault	Fault remedy
01236 P1760	Fuse defective	- Check wiring and connectors according to current flow diagram
Solenoid for selector lever lock -N110	Missing voltage supply of solenoid -N110	- Read measured value block =>Page 85 ; Display group number 003 2)
Open circuit/short to earth 1) Short to positive 1)	Open circuit or short circuit to earth or positive	- Carry out electrical test => Page 136

1) One of these displays appears in addition to component concerned.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
16987 P0603		
Control unit defective	Control unit -J217 defective	- Replace control unit => Page 3
16989 P0605		
Control unit defective	Control unit -J217 defective	- Replace control unit => Page 3
17086 P0702		
Control unit defective	Control unit -J217 defective	- Replace control unit => Page 3

Notes on fault codes 16987 / P 0603, 16989 / P0605 and 17086 / P0702:

After recognition of possible fault cause and remedy of following faults:

- ♦ Mechanical faults
- ♦ Hydraulic faults
- ♦ Electrical/electronic components and wiring connections

Output on VAS 5051	Possible causes of fault	Fault remedy
17087 P0703	Implausible brake light switch -F signal transmitted by engine control unit	- Read measured value block =>Page 85 ; Display group number 003 1)
Brake light switch -F	Fault in wiring between brake light switch -F and engine control unit (open circuit or short to earth/positive)	- Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
Electrical fault in circuit	Brake light switch -F defective	- Check wiring and connectors according to current flow diagram Replace brake light switch -F if necessary => Fig. 20
	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary

	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24
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Footnotes and notes on fault code 17087 / P0703 can be found on next page.

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 17087 / P0703:

- ◆ Brake light switch -F signal is transmitted by engine control unit via CAN bus line to gearbox control unit.
- ◆ Conditions of fault recognition: Brake light switch and brake test switch signals are transmitted via CAN bus wire to gearbox control unit for evaluation. This fault code is displayed in gearbox control unit in the event of implausibility.

Output on VAS 5051	Possible causes of fault	Fault remedy
17090 P0706 Drive stage sender => -F125 1) Implausible signal	Open circuit or short circuit to earth or positive Voltage supply of drive stage Sender (multi-function switch) is interrupted Drive stage sender (multi-function switch) -F125 defective Plug of drive stage Sender (multi-function switch) -F125 not plugged in	- Check wiring and connectors according to current flow diagram 2) - Read measured value block =>Page 85 ; Display group number 004 3) - Carry out electrical test => Page 136 - If necessary, replace drive stage Sender (multi-function switch) -F125 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Replacing multi-function switch -F125 Replacing multi-function switch -F125

- 1) The drive stage sender -F125 is generally known as multi-function switch -F125.
- 2) First check 8-pin connectors for contact corrosion and water damage and replace, if necessary.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17094 P0710 Sender for gearbox oil temperature -G93	Open circuit or short circuit to earth or positive Sender for gearbox oil temperature -G93 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 004 3)



Electrical fault in circuit		- Carry out electrical test => Page 136 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox
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- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17095 P0711 Sender for gearbox oil temperature -G93 Implausible signal	Open circuit or short circuit to earth or positive Sender for gearbox oil temperature -G93 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 004 3) - Carry out electrical test => Page 136 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox

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Footnotes and notes on fault code 17095 / P0711 can be found on next page.

- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Note on fault code 17095 / P0711:

- ◆ Condition for fault recognition: Gearbox oil temperature does not rise after starting engine or temperature jumps.

Output on VAS 5051	Possible causes of fault	Fault remedy
17096 P0712	Short to earth	- Check wiring and connectors according to current flow diagram 1)

Sender for gearbox oil temperature -G93 Signal too small	Sender for gearbox oil temperature -G93 defective	- Read measured value block =>Page 85 ; Display group number 004 3) - Carry out electrical test => Page 136 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox
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- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17097 P0713 Sender for gearbox oil temperature -G93 Signal too great	Open circuit or short circuit to positive Sender for gearbox oil temperature -G93 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 004 3) - Carry out electrical test => Page 136 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox Removing and installing oil pan, oil filter and valve body; Removing and installing wiring harness in gearbox

- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17100 P0716	Open circuit or short circuit to earth or positive	- Check wiring and connectors according to current flow diagram 1)



Sender for gearbox input speed -G182	Gearbox input speed sender -G182 defective	- Read measured value block =>Page 136 Replacing gearbox input speed sender-G182 => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox input speed sender -G182 Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox input speed sender -G182
Implausible signal Continued ▼	Faulty gearbox speed signal	- Carry out fault remedy according to fault code 17105 / P0721

Output on VAS 5051	Possible causes of fault	Fault remedy
Fault continued 17100 P0716 Sender for gearbox input speed -G182	ATF-oil level not OK Defective or incorrect converter	- Check ATF-oil level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF Checking/changing ATF Check converter code
	Slipping clutches or brakes	- Read measured value block, display group numbers 005 2) to 007 2) =>Page 85 and during driving operation, establish which elements are defective/not activated
Implausible signal	Solenoid valve or pressure control valve sticks	- Performing final control diagnosis If necessary, replace solenoid valves, pressure control valves or valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing valve body Removing and installing oil pan, oil filter and valve body; Removing and installing valve body

Footnotes and notes on fault code 17100 / P0716 can be found on next page.

- 1) First check connectors for corrosion and water damage and replace, if necessary.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Note on fault code 17100 / P0716:

- ♦ Condition for fault recognition: A driving position (D, 4, 3 or 2) is definitely selected, no intermittent setting. The engine speed is greater than 608 rpm in driving operation. The gearbox output speed is greater than 416 rpm in driving operation.
- ♦ The fault is displayed when conditions for fault recognition are met and the gearbox input speed is equal 0 rpm or greater than 8000 rpm.

Protected by copyright. Output on VAS 5051	Possible causes of fault	Fault remedy
17101 P0717	Open circuit or short circuit to earth or positive	- Check wiring and connectors according to current flow diagram 1)

<p>Sender for gearbox input speed -G182</p> <p>No signal</p> <p><small>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 © 2001 Audi AG</small></p>	<p>Screening of wiring to sender - G182 defective Gearbox input speed sender - G182 defective</p>	<p>- Read measured value block =>Page 136 Replace gearbox input speed sender if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox input speed sender -G182 Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox input speed sender -G182</p>
	<p>Engine speed signal/gearbox speed signal not OK</p>	<p>- Remedy fault in line with fault code 00529, 00297, 17106, 17110 or 17090</p>
	<p>ATF level not OK Defective or incorrect converter Continued ▼</p>	<p>- Check ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking ATF level and topping up Checking ATF level and topping up Check converter code</p>

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

Output on VAS 5051	Possible causes of fault	Fault remedy
<p>17101 P0717 Sender for gearbox input speed -G182</p> <p>No signal</p>	<p>(Fault 17101 / P0717 continued) Slipping clutches or brakes</p>	<p>Read measured value block, display group numbers 005 2) to 007 2) =>Page 85 and during driving operation, establish which elements are defective/ not activated</p>
	<p>Solenoid valve or pressure control valve sticks</p>	<p>- Perform final control diagnosis =>Page 70 If necessary, replace solenoid valves, pressure control valves or valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing valve body Removing and installing oil pan, oil filter and valve body; Removing and installing valve body</p>

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

- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Notes on fault code 17101 / P0717 can be found on next page.

Notes on fault recognition of fault code 17101 / P0717:

- ♦ The fault recognition process also includes a plausibility check: Ratio of gearbox input speed to engine speed and gearbox output speed with gear engaged implausible. (Test requirement: A definite forward gear must be engaged; selector lever must not be in P, N or any intermediate positions and gearshift must have been completed.)



Output on VAS 5051	Possible causes of fault	Fault remedy
17105 P0721 Gearbox output speed sender -G195 2) Implausible signal Continued ▼	Open circuit or short circuit to earth or positive Screen for -G195 defective Gearbox output speed sender -G195 2) defective Engine/gearbox input speed signal is incorrect	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 136 Replace gearbox output speed sender -G195 2) => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox speed sender -G38 Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox speed sender -G38 - Carry out fault remedy according to fault code 17100 / P0716 Continued ▼

Output on VAS 5051	Possible causes of fault	Fault remedy
Fault continued 17105 P0721 Sender for gearbox output speed -G195 Implausible signal	ATF oil level not OK Defective or incorrect converter Slipping of clutches/brakes or solenoid valve defective	- Check ATF-oil level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF Checking/changing ATF Check converter code - Read measured value block=>Page 85 , Display group numbers 005 3) to 007 3) and during driving operation, establish which elements are defective/not activated

- 1) First check connectors for corrosion and water damage and replace, if necessary.
- 2) Gearbox output speed sender -G195 is also referred to as gearbox speed sender -G38.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17106 P0722 Gearbox output speed sender -G195 2) No signal	Open circuit or short circuit to earth or positive Screen for gearbox speed sender -G38 2) defective Gearbox speed sender -G38 2) defective Engine/gearbox input speed signal is incorrect	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 136 Replace gearbox speed sender -G38 if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox speed sender -G38 Removing and installing oil pan, oil filter and valve body; Removing and installing gearbox speed sender -G38 - Carry out fault remedy according to fault code 17100 / P0716

	ATF level not OK Defective or incorrect converter Continued ▼	- Check ATF level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF Checking/changing ATF Check converter code
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Output on VAS 5051	Possible causes of fault	Fault remedy
17106 P0722 Gearbox output speed sender -G195 2) No signal	(Fault 17106 / P0722 continued) Slipping of clutches/brakes or solenoid valve defective	Read measured value block=>Page 85 , Display group numbers 005 3) to 007 3) and during driving operation, establish which elements are defective/not activated

- 1) First check connectors for corrosion and water damage and replace, if necessary.
- 2) Gearbox output speed sender -G195 is also referred to as gearbox speed sender -G38.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault recognition of fault code 17106 / P0722:

- ♦ The fault recognition process also includes a plausibility check: Ratio of gearbox output speed to engine speed and gearbox input speed with gear engaged implausible. (Test requirement: A definite forward gear must be engaged; selector lever must not be in P, N or any intermediate positions and gearshift must have been completed.)

9 - Part 3, up to fault code 18171 / P1763

9.1 - Part 3, up to fault code 18171 / P1763

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Output on VAS 5051	Possible causes of fault	Fault remedy
17110 P0726	Fault in engine speed sender - G28 detected by engine control unit Excessive engine speed detected (engine over-revving)	- Read measured value block =>Page 85 ; Display group number 001 1) Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
Speed signal from engine control unit	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 17110 / P0726:

- ♦ The engine speed signal is transmitted from the engine control unit to the gearbox control unit via the CAN bus line.



Output on VAS 5051	Possible causes of fault	Fault remedy
17114 P0730	ATF oil level not OK or ATF contaminated	- Check ATF-oil level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/changing ATF
Gear/transmission ratio monitoring Incorrect transmission ratio	Clutch slips/defective or solenoid valve dirty/defective	- Perform final control diagnosis =>Page 70
	Open circuit or short circuit to earth or positive	- Check wiring and connectors according to current flow diagram Carry out electrical test => Page 136
	Incorrect gearbox control unit installed or incorrectly coded	- Check gearbox control unit identification =>Page 24
	Sender for gearbox input speed - G182 defective	- Carry out fault remedy according to fault code 17100 / P0716 or 17101 / P0717
	Gearbox output speed sender - G195 defective	- Carry out fault remedy according to fault code 17105 / P0721 or 17106 / P0722

Footnotes and notes on fault code 17114 / P0730 can be found on next page.

Notes on fault recognition of fault code 17114 / P0730:

- ♦ The gear monitoring of the gearbox control unit checks the transmission ratio by comparing the gearbox input and output speed whilst taking the chosen gear into account. This fault is displayed when a recognised, unreliable transmission ratio (implausibility) is displayed.
- ♦ When testing the fixed brake speed the gearbox input speed in the converter must be almost Zero with selected gear and when stationary. If this is not the case this fault is also displayed, as the clutch could be damaged (Read measured value block =>Page 85 ; Display group number 001).

Output on VAS 5051	Possible causes of fault	Fault remedy
17115 P0731 1st gear	Clutch of selected gear slips/ is defective or the solenoid valve of this gear is contaminated/defective	- Perform final control diagnosis =>Page 70 See clutch logic or solenoid valve logic => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements Overview of transmission; Position of selector elements
Incorrect transmission ratio	Gearbox output speed sender - G195 defective	- Carry out fault remedy according to fault code 17105 / P0721 or 17106 / P0722
	Sender for gearbox input speed - G182 defective	- Carry out fault remedy according to fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit installed or incorrectly coded	- Check gearbox control unit identification =>Page 24

Notes on fault recognition of fault code 17115 / P0731:

- ♦ The gear monitoring of the gearbox control unit checks the transmission ratio by comparing the gearbox input and output speed whilst taking the chosen gear into account. This fault is displayed when a recognised, unreliable transmission ratio (implausibility) is displayed.

Output on VAS 5051	Possible causes of fault	Fault remedy
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17116 P0732 2nd gear Incorrect transmission ratio	Clutch of selected gear slips/is defective or the solenoid valve of this gear is contaminated/defective	- Perform final control diagnosis =>Page 70 See clutch logic or solenoid valve logic => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements Overview of transmission; Position of selector elements
	Gearbox output speed sender - G195 defective	- Carry out fault remedy according to fault code 17105 / P0721 or 17106 / P0722
	Sender for gearbox input speed - G182 defective	- Carry out fault remedy according to fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit installed or incorrectly coded	- Check gearbox control unit identification =>Page 24

Notes on fault recognition of fault code 17116 / P0732:

- ♦ The gear monitoring of the gearbox control unit checks the transmission ratio by comparing the gearbox input and output speed whilst taking the chosen gear into account. This fault is displayed when a recognised, unreliable transmission ratio (implausibility) is displayed.

Output on VAS 5051	Possible causes of fault	Fault remedy
17117 P0733 3rd gear Incorrect transmission ratio	Clutch of selected gear slips/is defective or the solenoid valve of this gear is contaminated/defective	- Perform final control diagnosis =>Page 70 See clutch logic or solenoid valve logic => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements Overview of transmission; Position of selector elements
	Gearbox output speed sender - G195 defective	- Carry out fault remedy according to fault code 17105 / P0721 or 17106 / P0722
	Sender for gearbox input speed - G182 defective	- Carry out fault remedy according to fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit installed or incorrectly coded	- Check gearbox control unit identification =>Page 24

Notes on fault recognition of fault code 17117 / P0733:

- ♦ The gear monitoring of the gearbox control unit checks the transmission ratio by comparing the gearbox input and output speed whilst taking the chosen gear into account. This fault is displayed when a recognised, unreliable transmission ratio (implausibility) is displayed.

Output on VAS 5051	Possible causes of fault	Fault remedy
17118 P0734 4th gear	Clutch of selected gear slips/is defective or the solenoid valve of this gear is contaminated/defective	- Perform final control diagnosis =>Page 70 See clutch logic or solenoid valve logic => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements Overview of transmission; Position of selector elements



Incorrect transmission ratio	Gearbox output speed sender - G195 defective	- Carry out fault remedy according to fault code 17105 / P0721 or 17106 / P0722
	Sender for gearbox input speed - G182 defective	- Carry out fault remedy according to fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit installed or incorrectly coded	- Check gearbox control unit identification =>Page 24

Notes on fault recognition of fault code 17118 / P0734:

- ♦ The gear monitoring of the gearbox control unit checks the transmission ratio by comparing the gearbox input and output speed whilst taking the chosen gear into account. This fault is displayed when a recognised, unreliable transmission ratio (implausibility) is displayed.

Output on VAS 5051	Possible causes of fault	Fault remedy
17119 P0735 5th gear	Clutch of selected gear slips/ is defective or the solenoid valve of this gear is contaminated/defective	- Perform final control diagnosis =>Page 70 See clutch logic or solenoid valve logic => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements Overview of transmission; Position of selector elements
Incorrect transmission ratio	Gearbox output speed sender - G195 defective	- Carry out fault remedy according to fault code 17105 / P0721 or 17106 / P0722
	Sender for gearbox input speed - G182 defective	- Carry out fault remedy according to fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit installed or incorrectly coded	- Check gearbox control unit identification =>Page 24

Notes on fault recognition of fault code 17119 / P0735:

- ♦ The gear monitoring of the gearbox control unit checks the transmission ratio by comparing the gearbox input and output speed whilst taking the chosen gear into account. This fault is displayed when a recognised, unreliable transmission ratio (implausibility) is displayed.

Output on VAS 5051	Possible causes of fault	Fault remedy
17125 P0741	ATF -oil level not OK Defective or incorrect converter	- Check ATF-oil level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Check- ing ATF level and topping up Check- ing ATF level and topping up Check converter code

Clutch for converter bridging No power transfer	Mechanical defect in pressure control valve 4 -N218 1) Problems with ATF oil supply to pressure control valve 4 -N2181) Valve for converter pressure defective Valve for converter clutch defective Continued ▼	- Read measured value block =>Page 85 ; Display group number 007 2) and clutch TC (closed) and check permissible converter slip Replace pressure control valve 4 -N218 or if necessary, valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing valve body Removing and installing oil pan, oil filter and valve body; Removing and installing valve body
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1) The pressure control valve 4 -N218 is also designated as solenoid valve 7 -N94.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17125 P0741 Clutch for converter bridging	(Fault 17125 / P0741 continued) Clutch for converter bridge, defective, worn out.	If necessary, replace torque converter => Automatic Gearbox 01V, FWD and 4WD; Repair group 32; Torque converter Torque converter
No power transfer	Electrical activation of pressure control valve 4 -N218 1) defective	- Carry out fault remedy according to fault code 18237 / 18238

1) The pressure control valve 4 -N218 is also designated as solenoid valve 7 -N94.

Notes on fault recognition of fault code 17125 / P0741:

- ♦ The ratio of gearbox input speed (-G182) to engine speed with closed converter clutch does not fit (implausibility).

Output on VAS 5051	Possible causes of fault	Fault remedy
17135 P0751 Shift valve 1 => solenoid valve 1 -N88 Open circuit/short to earth	Open circuit or short to earth Solenoid valve 1 -N88 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136
17136 P0752 Shift valve 1 => solenoid valve 1 -N88 Short to positive	Short to positive Solenoid valve 1 -N88 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136

Notes and footnotes on fault codes 17135 / P0751 and 17136 / P0752 can be found on next page.

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

**Notes on fault recognition of fault codes 17135 / P0751 and 17136 / P0752**

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

Output on VAS 5051	Possible causes of fault	Fault remedy
17137 P0753 Shift valve 1 => solenoid valve 1 -N88 Electrical fault in circuit	Open circuit or short circuit to earth or positive Solenoid valve 1 -N88 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17140 P0756 Shift valve 2 => Solenoid valve 2 -N89 Open circuit/short to earth	Open circuit or short to earth Solenoid valve 2 -N89 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136
17141 P0757 Shift valve 2 => Solenoid valve 2 -N89 Short to positive	Short to positive Solenoid valve 2 -N89 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136

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Notes and footnotes on fault codes 17140 / P0756 and 17141 / P0757 can be found on next page.

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17142 P0758 Shift valve 2 => Solenoid valve 2 -N89	Open circuit or short circuit to earth or positive Solenoid valve 2 -N89 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2)

Electrical fault in circuit		- Perform final control diagnosis =>Page 136
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- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17145 P0761 Shift valve 3 => Solenoid valve 3 -N90 Open circuit/short to earth	Open circuit or short to earth Solenoid valve 3 -N90 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136
17146 P0762 Shift valve 3 => Solenoid valve 3 -N90 Short to positive	Short to positive Solenoid valve 3 -N90 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136

Notes and footnotes on fault codes 17145 / P0761 and 17146 / P0762 can be found on next page.

- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17147 P0763 Shift valve 3 => Solenoid valve 3 -N90 Electrical fault in circuit	Open circuit or short circuit to earth or positive Solenoid valve 3 -N90 defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 005 2) - Perform final control diagnosis =>Page 136

- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and cable loom.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
17968 P1560 Maximum engine speed exceeded	Signal from engine speed Sender to engine control unit faulty Engine speed Sender -G28 defective Engine speed signal is interrupted by incorrectly laid electric lines (e.g. retrofitting of telephone)	- Read measured value block =>Page 85 ; Display group number 001 1) Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis



	Impermissible downshift of gearbox (e.g. through mechanically defective valve body)	- Read measured value block, display group number 005 =>Page 85 and during driving operation, establish which elements are defective/not active If necessary, replace solenoid valves or valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing oil pan, oil filter and valve body; Removing and installing valve body Removing and installing oil pan, oil filter and valve body; Removing and installing valve body
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1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Note on fault code 17968 / P1560:

- ◆ Condition for fault recognition: Engine speed greater than 7400 rpm.

Output on VAS 5051	Possible causes of fault	Fault remedy
18112 P1704	Short to earth between -F8 and gearbox control unit	- Check wiring and connectors according to current flow diagram
Kickdown switch -F8	Open circuit between -F8 and gearbox control unit	- Read measured value block =>Page 85 ; Display group number 008 2)
Electrical fault in circuit	Kickdown switch -F8 1) defective	- Carry out electrical test => Page 19

1) The kickdown switch -F8 is integrated in the accelerator position sender -G79.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Note on fault code 18112 / P1704:

- ◆ Conditions of fault recognition: Throttle flap signal OK, throttle flap value lower than 25% and kickdown input at gearbox control unit has a short to earth(corresponding to kickdown signal) or positive, engine must be running.
- ◆ If the brake pedal is pressed and at the same time the accelerator pedal is applied as far as kickdown (full throttle), this may be the cause of a wrong fault message being displayed even though the kickdown switch is OK.

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Output on VAS 5051	Possible causes of fault	Fault remedy
18141 P1733	Short to earth in Tiptronic switch - F189 1) downshift position (back)	- Read measured value block =>Page 85 ; Display group number 011 2)
Switch for Tiptronic, return -F189	Short to earth in wiring	- Carry out electrical test => Page 136

Short to earth	Tiptronic shift up/shift down switch -F189 is defective	- Replace Tiptronic shift up/shift down switch -F189 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism
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- 1) When selector lever is in Tiptronic gate, it is possible to shift down manually by moving lever back (-), or - on vehicles with Tiptronic sports steering wheel - by pressing one of the minus (-) buttons on the steering wheel (downshift switch).
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Notes on fault recognition of fault code 18141 / P1733:

- ♦ Fault is displayed if operation of downshift switch 1) is detected in selector lever position other than D.

Output on VAS 5051	Possible causes of fault	Fault remedy
18147 P1739 Tiptronic upshift switch -F189 Short to earth	Short to earth in Tiptronic switch - F189 1) upshift position (forward) Short to earth in wiring Tiptronic shift up/shift down switch - F189 is defective	- Read measured value block =>Page 85 ; Display group number 011 2) - Carry out electrical test => Page 136 - Replace Tiptronic shift up/shift down switch -F189 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism

- 1) When selector lever is in Tiptronic gate, it is possible to shift up manually by moving lever forwards (+), or - on vehicles with Tiptronic sports steering wheel - by pressing one of the positive (+) buttons on the steering wheel (upshift switch).
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

Notes on fault recognition of fault code 18147 / P1739:

- ♦ Fault is displayed if operation of upshift switch 1) is detected in selector lever position other than D.

Output on VAS 5051	Possible causes of fault	Fault remedy
18152 P1744 Tiptronic recognition switch -F189 Short to earth	Short to earth in Tiptronic recognition switch -F189 1) Short to earth in wiring Tiptronic recognition switch -F189 is defective	- Read measured value block =>Page 85 ; Display group number 011 2) - Carry out electrical test => Page 136 - Replace Tiptronic recognition switch -F189 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism

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- 1) When switching to the Tiptronic gate in the selector lever position D this switching procedure is recognised by the Tiptronic switch -F189 and transferred to the gearbox control unit.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".

**Note on fault recognition of fault code 18152 / P1744:**

- ♦ Fault is displayed if Tiptronic switch detects shift to Tiptronic mode although selector lever is not in Tiptronic gate.

Output on VAS 5051	Possible causes of fault	Fault remedy
18153 P1745	Short circuit of contacts 52, 53 from control unit -J217 to positive	- Check supply voltage to control unit -J217; to do so, read measured value block =>Page 85 ; Display group number 003 2)
Supply voltage for solenoid valves	Control unit -J217 defective	- Check wires and connections according to current flow diagram 1)
Short to positive		- Carry out electrical test => Page 3

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18155 P1747	Open circuit or short to earth in contacts 52, 53 of control unit -J217	- Check supply voltage to control unit -J217; to do so, read measured value block =>Page 85 ; Display group number 003 2)
Supply voltage for solenoid valves	Control unit -J217 defective	- Check supply voltage to control unit -J217
Open circuit/short to earth		- Check wires and connections according to current flow diagram 1)
		- Carry out electrical test => Page 3

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18156 P1748		
Control unit defective	Control unit -J217 defective	- Replace control unit => Page 3

Notes on fault codes 18156 / P1748:

After recognition of possible fault cause and remedy of following faults:

- ♦ Mechanical faults
- ♦ Hydraulic faults
- ♦ Electrical/electronic components and wiring connections

Output on VAS 5051	Possible causes of fault	Fault remedy
18157 P1749		
Control unit for automatic gearboxes	Gearbox control unit recognises invalid coding	- Check gearbox control unit identification =>Page 3

Incorrect coding	Engine control unit incorrectly coded or wrong engine control unit fitted	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary
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Output on VAS 5051	Possible causes of fault	Fault remedy
18158 P1750	Open circuit or short to earth	- Check wiring and connectors according to current flow diagram
Voltage supply	Battery monitoring recognises fault	- Check supply voltage to control unit -J217
Voltage too low	Open circuit/short circuit to constant positive in gearbox control unit	- Read measured value block =>Page 85 ; Display group number 003 1) - Carry out electrical test => Page 3

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18158 / P1750:

- ◆ Condition for fault recognition: Battery voltage less than/equal to 9 V => gearbox switches to emergency running => Page 1 .
- ◆ When the system voltage (term. 30) fails application values are lost, i.e. the engine control unit must be readapted to these values on restart. The switching quality may be lower than normal during this readaption process.

Output on VAS 5051	Possible causes of fault	Fault remedy
18159 P1751	Supply voltage for engine control unit - J217 greater than 16 Volt	- Check wiring and connectors according to current flow diagram
Voltage supply	Voltage controller -C1 for light machine defective/faulty For example, second battery was switched into series by mistake during external start.	- Check supply voltage to control unit -J217 Read measured value block=>Page 136
Voltage too high		- Check voltage controller -C1 for light machine and if necessary, replace => Electrical System; Repair group 27

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18159 / P1751:

- ◆ Condition for fault recognition: Battery voltage greater than 16 Volt.
- ◆ The battery monitoring is divided into four areas: (U = battery voltage)
1. U < 7 Volt => gearbox switches to emergency run => Page 1

Output on VAS 5051	Possible causes of fault	Fault remedy
18160 P1752	Supply voltage for automatic gearbox control unit -J217 subject to pronounced fluctuation/voltage interrupted	- Check wiring and connectors according to current flow diagram Check supply voltage to control unit -J217
Voltage supply	Voltage controller -C1 for light machine defective/faulty	- Read measured value block =>Page 136



Implausible signal	- Check voltage controller -C1 for light machine and if necessary, replace => Electrical System; Repair group 27
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1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18160 / P1752:

- ♦ Condition for fault recognition: Battery voltage less than/equal to 9 V => gearbox switches to emergency running => Page 1.
- ♦ When the system voltage (term. 30) fails application values are lost, i.e. the engine control unit must be readapted to these values on restart. The switching quality may be lower than normal during this readaption process.

Output on printer	Possible causes of fault	Fault remedy
18161 P1753 Switch for Tiptronic -F189 Implausible signal	- Selector lever cable not correctly adjusted - Tiptronic switch -F125 defective 1)	- Check adjustment of selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37 85 ; Display group number 002 2) Replace Tiptronic recognition switch - F189 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism
	- Connector not connected to shift mechanism - No supply voltage of shift mechanism - Open circuit in all 3 Tiptronic lines	- Check wiring and connectors according to current flow diagram

1) When switching to the Tiptronic gate in the selector lever position D this switching procedure is recognised by the Tiptronic switch -F189 and transferred to the gearbox control unit.

2) When selecting measured value block, note what type of hydraulic control the gearbox features; control E18/2 must be selected here. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18169 P1761 Select. lev. lock =>Solenoid -N1101) Short to earth	Short to earth 3) Missing voltage supply of solenoid -N110 Fuse defective Solenoid -N110 defective	- Check wiring and connectors according to current flow diagram - Read measured value block =>Page 85 ; Display group number 003 2) - Carry out electrical test => Page 136 Replace solenoid -N110 if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism

			Control unit -J217 defective	- If necessary, replace gear control unit -J217 => Page 3
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- 1) Select. lev. lock => Solenoid -N110 is also referred to as selector lever lock solenoid -N110
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".
- 3) Solenoid -N110 for selector lever lock cannot be switched off, i.e. the selector lever cannot even be switched out of selector lever positions P or D when operating the brake pedal.

Output on VAS 5051			Possible causes of fault	Fault remedy
18170 P1762 Select. lev. lock => Solenoid -N1101) Short to positive			Short to positive 3)	- Check wiring and connectors according to current flow diagram
			Solenoid -N110 defective	- Read measured value block => Page 85 ; Display group number 003 2) - Carry out electrical test => Page 136 Replace solenoid -N110 if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism
			Control unit -J217 defective	- If necessary, replace gear control unit -J217 => Page 3

- 1) Select. lev. lock => Solenoid -N110 is also referred to as selector lever lock solenoid -N110
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".
- 3) The solenoid -N110 for selector lever lock cannot be activated in selector lever positions P and N, i.e. it can be switched out of P and N without operating the brake pedal.

Output on VAS 5051			Possible causes of fault	Fault remedy
18171 P1763 Select. lev. lock => Solenoid -N110 1) Open circuit			Open circuit in wiring to solenoid -N110 2)	- Check wiring and connectors according to current flow diagram
			Solenoid -N110 defective	- Read measured value block => Page 85 ; Display group number 003 3) - Carry out electrical test => Page 136 Replace solenoid -N110 if necessary => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism
			Control unit -J217 defective	- If necessary, replace gear control unit -J217 => Page 3

- 1) Select. lev. lock => Solenoid -N110 is also referred to as selector lever lock solenoid -N110
- 2) The solenoid -N110 for selector lever lock cannot be activated in selector lever positions P and N, i.e. it can be switched out of P and N without operating the brake pedal.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page **85** => under "Reading measured value block".



10 - Part 4, up to fault code 65535

10.1 - Part 4, up to fault code 65535

Output on VAS 5051	Possible causes of fault	Fault remedy
18179 P1771 1) Load signal from engine control unit Open circuit/short to positive	Fault in wiring between engine control unit and gearbox control unit or other components receiving the same signal (such as on-board computer)	- Check wiring and connectors according to current flow diagram Read measured value block =>Page 85 ; Display group number 009 2)
18180 P1772 1) Load signal from engine control unit Short to earth	Short circuit in components also receiving the same signal (such as on-board computer) No signal being sent from engine control unit, or signal is incorrect	- Carry out electrical test => Page 136 Test relevant components (see current flow diagram) - Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis

- 1) One of the two fault codes will be stored in the memory, according to the type of fault.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Note on fault codes 18180 / P1772 and 18179 / P1771

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- ♦ Condition for fault recognition: No fault detected in engine speed or throttle valve signal, and no engine load signal registered for a period of 245 ms.
- ♦ If the engine control unit detects a fault in the load signal then it informs the gearbox control unit.

Output on VAS 5051	Possible causes of fault	Fault remedy
18192 P1784 Up/down switch circuit Open circuit/short to earth	Open circuit or short to earth in wiring between engine control unit and gearbox control unit (pin 51)	- Check wiring and connectors according to current flow diagram - Read measured value block =>Page 136 Check and if necessary replace engine control unit - Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis

- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Note on fault code 18192 / P1784:

- ♦ This fault can only occur on model versions without CAN bus A)

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Output on VAS 5051	Possible causes of fault	Fault remedy
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18193 P1785 Up/down switch circuit Short to positive	Short to positive in wiring between engine control unit and gearbox control unit (pin 51)	<ul style="list-style-type: none"> - Check wiring and connectors according to current flow diagram - Read measured value block =>Page 136 Check and if necessary replace engine control unit - Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
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1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Note on fault code 18193 / P1785:

- ◆ This fault can only occur on model versions without CAN bus A)

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Output on VAS 5051	Possible causes of fault	Fault remedy
18222 P1814 Pressure control valve 1 -N215 Open circuit/short to earth	Open circuit or short to earth Pressure control valve 1 -N215 2) defective	<ul style="list-style-type: none"> - Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 - Display group number 006 3) - Carry out electrical test => Page 136

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.

2) The pressure control valve 1 -N215 is also designated as solenoid valve 4 -N91.

3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18223 P1815 Pressure control valve 1 -N215 Short to positive	Short to positive Pressure control valve 1 -N215 2) defective	<ul style="list-style-type: none"> - Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 006 3) - Carry out electrical test => Page 136

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.

2) The pressure control valve 1 -N215 is also designated as solenoid valve 4 -N91.

3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".



Output on VAS 5051	Possible causes of fault	Fault remedy
18227 P1819 Pressure control valve 2 -N216 Open circuit/short to earth	Open circuit or short to earth Pressure control valve 2 -N216 2) defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 006 3) - Carry out electrical test => Page 136

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.

2) The pressure control valve 2 -N216 is also designated as solenoid valve 5 -N92.

3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18228 P1820 Pressure control valve 2 -N216 Short to positive	Short to positive Pressure control valve 2 -N216 2) defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 006 3) - Carry out electrical test => Page 136

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.

2) The pressure control valve 2 -N216 is also designated as solenoid valve 5 -N92.

3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18232 P1824 Pressure control valve 3 -N217 Open circuit/short to earth	Open circuit or short to earth Pressure control valve 3 -N217 2) defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 006 3) - Carry out electrical test => Page 136

1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.

2) The pressure control valve 3 -N217 is also designated as solenoid valve 6 -N93.

3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18233 P1825 Pressure control valve 3 -N217	Short to positive Pressure control valve 3 -N217 2) defective	- Check wiring and connectors according to current flow diagram 1) - Read measured value block =>Page 85 ; Display group number 006 3)

Output on VAS 5051	Possible causes of fault	Fault remedy
Short to positive		- Carry out electrical test => Page 136

- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 2) The pressure control valve 3 -N217 is also designated as solenoid valve 6 -N93.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18237 P1829	Open circuit or short to earth	- Check wiring and connectors according to current flow diagram 1)
Pressure control valve 4 -N218	Pressure control valve 4 -N218 2) defective	- Read measured value block =>Page 85 ; Display group number 007 3)
Open circuit/short to earth		- Carry out electrical test => Page 136

- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 2) The pressure control valve 4 -N218 is also designated as solenoid valve 7 -N94.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18238 P1830	Short to positive	- Check wiring and connectors according to current flow diagram 1)
Pressure control valve 4 -N218	Pressure control valve 4 -N218 2) defective	- Read measured value block =>Page 85 ; Display group number 007 3)
Short to positive		- Carry out electrical test => Page 136

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- 1) First check connectors for contact corrosion or water damage and if necessary, replace. When faults of the solenoid or pressure control valves are displayed pay special attention to the 16-pin connector at the gearbox between valve body and wiring harness.
- 2) The pressure control valve 4 -N218 is also designated as solenoid valve 7 -N94.
- 3) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Output on VAS 5051	Possible causes of fault	Fault remedy
18249 P1841	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24 , if necessary, replace
Engine/gearbox control unit Gearbox not matched to engine version	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis



Output on VAS 5051	Possible causes of fault	Fault remedy
		- Read out fault memory of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary

Output on VAS 5051	Possible causes of fault	Fault remedy
18258 P1850	The ignition was switched on with plug of gearbox control unit -J217 disconnected.	- Check connector of connection wiring from engine to gearbox control unit
Drive data bus 1)	Open circuit or short circuit between engine and gearbox control unit	- Carry out electrical test => Page 85 ; Display group number 008 2) and 009 2)
Missing message from engine control unit	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Replace engine control unit if necessary

1) Drive data bus is also known as CAN bus.

2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18258 / P1850:

- ♦ Data and signals are exchanged between gearbox control unit and other control units communicating with it via a "CAN bus". All information signals are transferred through 2 lines.
- ♦ Function of CAN-Bus => Page 131

Output on VAS 5051	Possible causes of fault	Fault remedy
18259 P1851	Ignition was switched on while gearbox control unit -J192 was disconnected	- Check connector of connection wiring from engine to gearbox control unit
Drive data bus 1)	Open circuit in wiring or short circuit between engine control unit and gearbox control unit/between ABS control unit and engine control unit	- Carry out electrical test => Page 85 ; Display group number 008 2) and 009 2)
	Incorrect or defective ABS control unit	- Check ABS control unit identification => Running Gear, FWD and 4WD; Repair group 01; Self-diagnosis Self-diagnosis
	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
No message from ABS control unit	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

Notes and footnotes on fault code 18259 / P1851 can be found on next page.

- 1) Drive data bus is also known as CAN bus.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18259 / P1851 (CAN-Bus):

- ◆ Data and signals are exchanged between gearbox control unit and other control units communicating with it via a "CAN bus". All information signals are transferred through 2 lines.
- ◆ Function of CAN-Bus => Page 131

Output on VAS 5051	Possible causes of fault	Fault remedy
18262 P1854	Open circuit or short circuit between engine and gearbox control unit	- Check connector of connection wiring from engine to gearbox control unit Carry out electrical test => Page 136
Drive data bus 1)	Short circuit between CAN wires	- Read measured value block =>Page 85 ; Display group number 008 2) and 009 2)
	Defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
Hardware defective	Defective gearbox control unit	- Check gearbox control unit identification =>Page 24

Notes and footnotes on fault code 18262 / P1854 can be found on next page.

- 1) Drive data bus is also known as CAN bus.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18262 / P1854:

- ◆ Data and signals are exchanged between gearbox control unit and other control units communicating with it via a "CAN bus". All information signals are transferred through 2 lines.
- ◆ Function of CAN-Bus => Page 131

Output on VAS 5051	Possible causes of fault	Fault remedy
18263 P1855	The ignition was switched on with plug of gearbox control unit -J217 disconnected	- Check connector of connection wiring from engine to gearbox control unit Carry out electrical test => Page 136
Drive data bus 1)		- Read measured value block =>Page 85 ; Display group number 008 2) and 009 2)
	Incorrect engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
Software position monitoring	Incorrect gearbox control unit	- Check gearbox control unit identification =>Page 24

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Notes and footnotes on fault code 18263 / P1855 can be found on next page.

- 1) Drive data bus is also known as CAN bus.
- 2) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18263 / P1855 (CAN-Bus):

- ♦ Data and signals are exchanged between gearbox control unit and other control units communicating with it via a "CAN bus". All information signals are transferred through 2 lines.
- ♦ Function of CAN-Bus => Page 131

Output on VAS 5051	Possible causes of fault	Fault remedy
18264 P1856 G69 throttle valve potentiometer. Fault message from engine control unit	Fault in throttle flap potentiometer -G69 diagnosed by engine control unit	- Read measured value block =>Page 85 ; Display group number 008 1) and 009 1)
	Wiring connection between throttle valve potentiometer and engine control unit defective	- Read stored fault code of engine control unit and remedy fault
	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

- 1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from page 85 => under "Reading measured value block".

Notes on fault code 18264 / P1856:

- ♦ The signal from throttle valve potentiometer -G69 is transmitted from the engine control unit to the gearbox control unit via the CAN bus line.
- ♦ Conditions of fault recognition: The fault in the component concerned is diagnosed by the engine control unit. This fault diagnosis is sent to the engine control unit via the CAN bus-line.

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Output on VAS 5051	Possible causes of fault	Fault remedy
18265 P1857 Load signal Fault message from engine control unit	No signal being sent from engine control unit, or signal is incorrect Fault in "signal for motor torque" diagnosed by engine control unit	- Read measured value block =>Page 85 ; Display group number 008 1) and 009 1) Read stored fault code of engine control unit and remedy fault => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis Check wiring and connectors according to current flow diagram
	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

Notes and footnotes on fault code 18265 / P1857 can be found on next page.

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18265 / P1857:

- ◆ Conditions of fault recognition: The fault in the component concerned is diagnosed by the engine control unit. This fault diagnosis is sent to the engine control unit via the CAN bus-line.
- ◆ Condition for fault recognition: No fault detected in engine speed or throttle valve signal, and no engine load signal registered for a period of 245 ms.
- ◆ If the engine control unit detects a fault in the load signal, it will pass on this information to the gearbox control unit by transmitting a fault pulse signal.

Output on VAS 5051	Possible causes of fault	Fault remedy
18266 P1858	Fault in engine speed sender -G28 detected by engine control unit	- Read measured value block =>Page 85 ; Display group number 001 1) Read stored fault code of engine control unit and remedy fault
Speed signal from engine control unit	Incorrect or defective engine control unit	- Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
Fault message from engine control unit	Incorrect or defective gearbox control unit	- Check gearbox control unit identification =>Page 24

1) When selecting measured value block, note what type of hydraulic control the gearbox features. A more detailed description can be found from Page 85 => under "Reading measured value block".

Notes on fault code 18266 / P1858 for vehicle models with CAN bus:

- ◆ The engine speed signal is transmitted from the engine control unit to the gearbox control unit via the CAN bus line.
- ◆ Conditions of fault recognition: The fault in the component concerned is diagnosed by the engine control unit. This fault diagnosis is sent to the engine control unit via the CAN bus-line.

Output on VAS 5051	Possible causes of fault	Fault remedy
18269 P1861	Open circuit or short circuit between accelerator position sender -G79 and engine control unit	- Check wiring and connectors according to current flow diagram 1)
Accelerator position sender -G79	Accelerator position sender -G79 defective	- Read stored fault code of engine control unit and remedy fault Check engine control unit identification => Refer to Engine Workshop Manual; Repair group 01; Self-diagnosis
Fault message from engine control unit		

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

Output on VAS 5051	Possible causes of fault	Fault remedy
65535	Control unit -J217 defective	- Replace control unit => Page 3
Control unit defective		



Notes on fault code 65535:

After recognition of possible fault cause and remedy of following faults:

- ♦ Mechanical faults
- ♦ Hydraulic faults
- ♦ Electrical/electronic components and wiring connections

11 - Final control diagnosis

11.1 - Final control diagnosis

Notes:

- ♦ A distinction is made between two types of gearbox.
Gearbox with hydraulic control E17, in which gearbox input speed sender (inductive sender) is attached to underside of valve body.
Gearbox with hydraulic control E18/2, in which gearbox input speed sender (Hall sender) is attached to gearbox housing behind valve body.
- ♦ Information on the gearbox concerned can be found in the tables in the following Workshop Manual

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

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Final control diagnosis for gearbox with hydraulic control E17 => from Page 70

Final control diagnosis for gearbox with hydraulic control E18/2 => from Page 73

11.2 - Final control diagnosis for gearbox with hydraulic control E17

Notes:

- ♦ Final control diagnosis can only be performed with the selector lever in position "P", the engine not running and the vehicle stationary
- ♦ The final control diagnosis is stopped when the engine is started.
- ♦ The function of the solenoid valves 1 -N88, solenoid valves 2 -N89 and solenoid valves 3 -N90 and the solenoid for the selector lever lock are acoustically tested during the final control diagnosis. Since the switching action (clicking) of the control elements is very quiet, excessive background noise should be avoided when carrying out this part of the test.
- ♦ Solenoid valves 4, 5, 6 and 7 (-N91, -N92, -N93 and -N94) are actuated by the final control diagnosis. A direct function control of these components is not possible.
- ♦ During final control diagnosis, the individual control elements are actuated in turn for approximately 30 seconds, unless the ► key is pressed to switch to next control element.
- ♦ If ► key is not pressed during these 30 seconds, final control diagnosis is terminated.
- ♦ After switching on the ignition only a complete final control diagnosis is possible. To perform a second final control diagnosis the ignition must be switched off and then on again.

The final control diagnosis actuates the following components in the stated order:

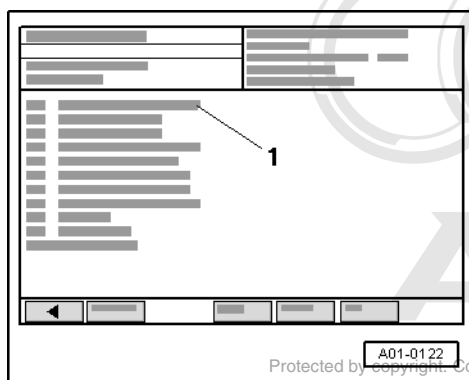
Actuation sequence	Acoustic test
1. Solenoid valve 1 -N88	yes
2. Solenoid valve 2 -N89	yes
3. Solenoid valve 3 -N90	yes
4. Solenoid for selector lever lock - N110	yes
5. Solenoid valve 4 -N91	no

Actuation sequence	Acoustic test
6. Solenoid valve 5 -N92	no
7. Solenoid valve 6 -N93	no
8. Solenoid valve 7 -N94	no
9. Kickdown switch -F8 (kickdown for air conditioner)	no
10. Relay for solenoid valves	no

Fitting location of control elements => Page **3**.

Test requirements:

- Fuses OK.



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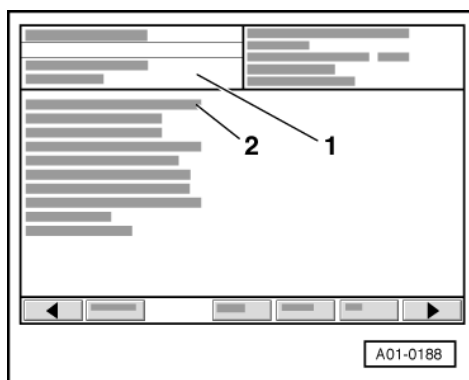
=> "Current Flow Diagrams, Electrical Fault-finding and Fitting Locations" binder

Procedure

- Connect the vehicle diagnostic, testing and information system VAS 5051 => Page **21** and select vehicle system "02 - Gearbox electronics". For this purpose, the ignition must be switched on.

-> Display on VAS 5051:

- Under -1- select the diagnostic function "03 - Final control diagnosis".

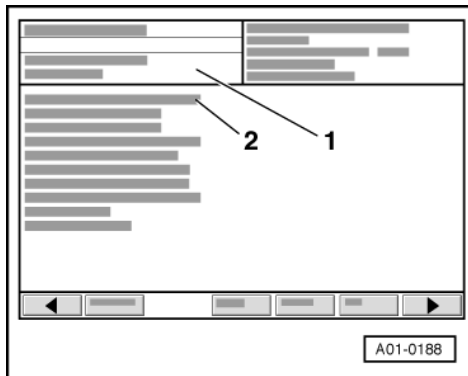


-> Display on VAS 5051:

- 1 - Display of control element currently actuated, e.g.: "1st control element being tested"



2 - Display of which control element is being actuated. If next control element is selected using ► key, the previously processed control elements remain in the text and the new control element is displayed at bottom position



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Notes:

Fitting location of control elements => Page 3.

Now the control elements can be actuated in the sequence described on the previous pages.

Pressing the ► key advances to the next control element, until the control element test is completed.

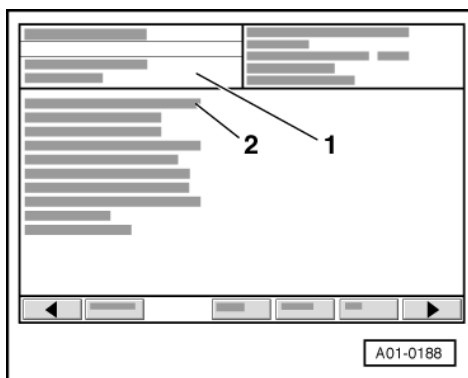
Before restarting the final control diagnosis the engine must be started and the ignition switched off and on again.

The functions of the first four control elements (solenoid valve 1 -N88, solenoid valve 2 -N89, solenoid valve 3 -N90 and selector lever lock => solenoid -N110) are acoustically tested during the final control diagnosis. Since the switching action (clicking) of the control elements is very quiet, excessive background noise should be avoided when carrying out this part of the test.

- During the acoustic testing, ambient noise must be avoided as the switching noise (clicking) of the control elements is extremely quiet.
- If during actuation of the first four control elements, the clicking is not audible with every control element, the electrical check must be carried out => Page 136

All other control elements are not audible during actuation.

The following describes some special features of these remaining control elements.

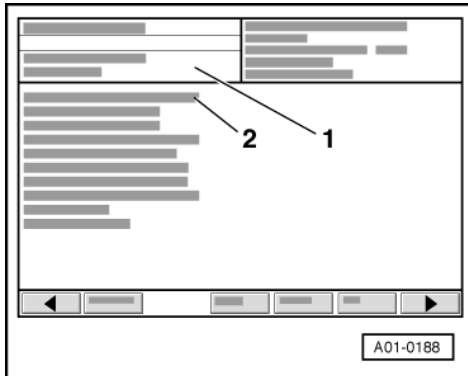


-> Display on VAS 5051:

- 1 - Display: 9th control element being tested
- 2 - Lowest display zone: Kickdown switch -F8

Notes:

- ◆ This function actuates the air conditioner cut-off function in gearbox control unit -J217, and not kickdown switch -F8.
- ◆ When the kickdown switch is operated by the driver, the gearbox control unit switches the air conditioner output to earth. This briefly cuts out the air conditioner compressor.
- ◆ Signal can be checked in measured value block 11 => Page 85 .



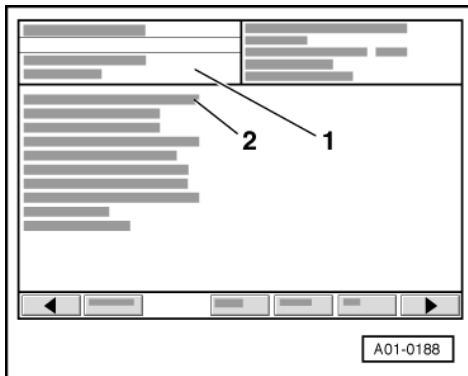
- ◆ For checking function of kickdown switch -F8, see electrical testing => Page 136 .
- ◆ Can be ignored here. Press ▶ key to switch to next control element.

-> Display on VAS 5051:

- 1 - Display: 10th control element being tested
- 2 - Lowest display zone: Relay for solenoid valves

- Solenoid valves actuated in position "P" are actuated (quiet clicking audible)

- ◆ Can be ignored.



-> Display on VAS 5051:

- 1 - Display: control element test is completed

Before restarting the final control diagnosis the engine must be started and the ignition switched off and on again.

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11.3 - Final control diagnosis for gearbox with hydraulic control E18/2

Notes:

- ◆ Final control diagnosis can only be performed with ignition switched on, the selector lever in position "P", the engine not running and the vehicle stationary
- ◆ The final control diagnosis is stopped when the engine is started.



- ♦ The function of the solenoid valves 1 -N88, solenoid valves 2 -N89 and solenoid valves 3-N90 and the solenoid for the selector lever lock 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.
- ♦ The pressure control valves 1 -N215, pressure control valves 2 -N216, pressure control valves 3 -N217 and pressure control valves 4 -N218 are actuated by the final control diagnosis. A direct function control of these components is not possible.
- ♦ During final control diagnosis, the individual control elements are actuated in turn for approximately 30 seconds, unless the ▶ key is pressed to switch to next control element.
- ♦ If ▶ key is not pressed during these 30 seconds, final control diagnosis is terminated.
- ♦ After switching on the ignition only a complete final control diagnosis is possible. To repeat the ignition must be switched off and on again.

Actuation sequence	Acoustic test
1. Solenoid valve 1 -N88	yes
2. Solenoid valve 2 -N89	yes
3. Solenoid valve 3 -N90	yes
4. Selector lever lock => Solenoid -N110	yes
5. Pressure control valve 1 -N215	no
6. Pressure control valve 2 -N216	no
7. Pressure control valve 3 -N217	no
8. Pressure control valve 4 -N218	no
9. Supply voltage for solenoid valves	no

Fitting location of control elements => Page **3**.

Test requirements:

- Fuses OK.

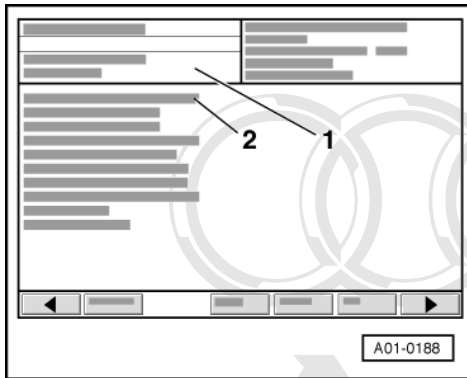
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=> "Current Flow Diagrams, Electrical Fault-finding and Fitting Locations" binder

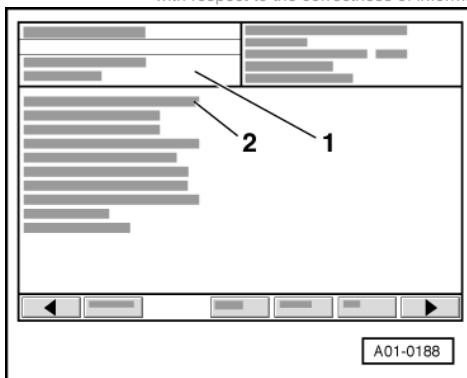
Procedure

- Connect the vehicle diagnostic, testing and information system VAS 5051 => Page **21** and select vehicle system "02 - Gearbox electronics". For this purpose, the ignition must be switched on.
- > Display on VAS 5051:
- Under -1- select the diagnostic function "03 - Final control diagnosis".



-> Display on VAS 5051:

- 1 - Display of control element currently actuated, e.g.: "1st control element being tested"
- 2 - Display of which control element is being actuated. If within 30 seconds the next control element is selected using ► key, the previously processed control elements remain in the text and the new control element is displayed at bottom position



Notes:

Fitting location of control elements => Page 3.

Now the control elements can be actuated in the sequence described on the previous pages.

Pressing the ► key advances to the next control element, until the control element test is completed.

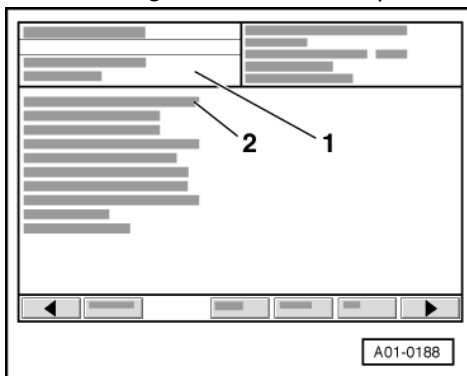
Before restarting the final control diagnosis the engine must be started and the ignition switched off and on again.

The functions of the first four control elements (solenoid valve 1 -N88, solenoid valve 2 -N89, solenoid valve 3 -N90 and selector lever lock => solenoid -N110) 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.
- If during actuation of the first four control elements, the clicking is not audible with every control element, the electrical check must be carried out => Page 136

All other control elements are not audible during actuation.

The following describes some special features of these remaining control elements.



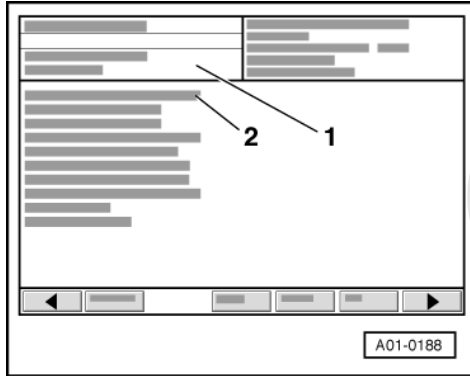


-> Display on VAS 5051:

- 1 - Display: 8th control element being tested
- 2 - Lowest display zone: Pressure control valve 4 -N218

Note:

Due to a software error, "Pressure control valve 5 -N233" may possibly be displayed, even though it does not exist. This display can be ignored. Press ▶ key to switch to next control element.

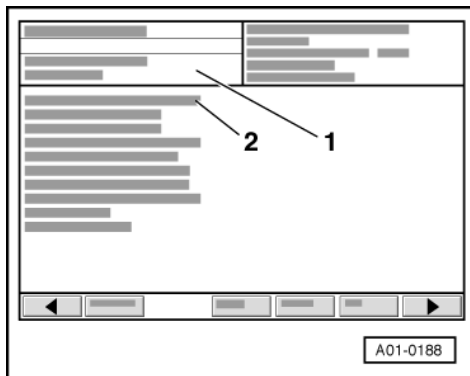


-> Display on VAS 5051:

- 1 - Display: 9th control element being tested
- 2 - Lowest display zone: Supply voltage for solenoid valves

- Solenoid valves activated in position "P" are actuated (quiet clicking audible)

♦ Can be ignored.

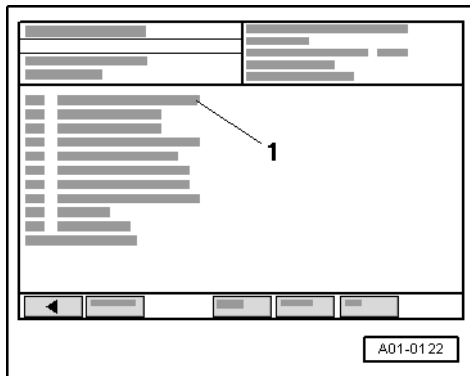


-> Display on VAS 5051:

- 1 - Display: control element test is completed

Before restarting the final control diagnosis the engine must be started and the ignition switched off and on again.

- End function "03 - Final control diagnosis" by pressing the ◀ key.



-> Display on VAS 5051:

- Select diagnostic function "06 - End output"=> Page 79 .

12 - Erasing fault memory

12.1 - Erasing fault memory

Note:

If it is not possible to erase fault memory, interrogate it once again and remedy faults.



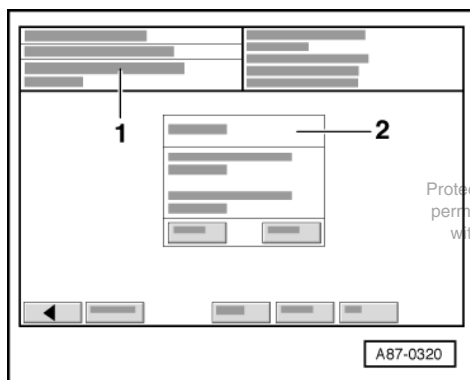
Prerequisite:

- Fault memory interrogated => Page 25 .
- All faults rectified.

After fault memory has been successfully interrogated:

-> Display on VAS 5051:

- Under -1- select diagnostic function "05 - Erase fault memory".



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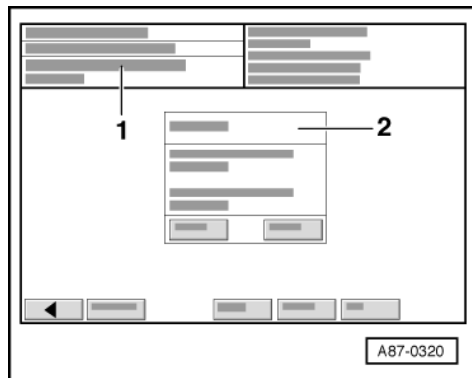
-> Display on VAS 5051:

- 1 - - No display (before erasing)
- or
- fault memory erased

**Note:**

If the following note appears in display zone -1-: "Fault memory not yet interrogated", if the procedure was not followed exactly. The fault memory can only be erased once the fault memory has been interrogated.

If, for example, the ignition was switched on between interrogating and erasing fault memory the fault memory was not erased.



-> Display on VAS 5051:

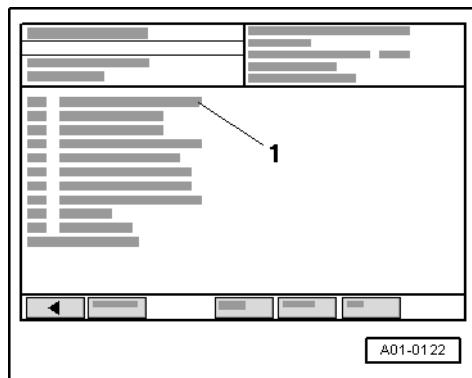
2 - Note:

Should the function be carried out?

Note: Data will be erased.

- Press the "OK" key in display -2-.
- End function "05 - Erase fault memory" by pressing the ◀ key.

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-> Display on VAS 5051:

- Select diagnostic function "06 - End output"=> Page 79 .
- After interrogating and erasing of fault memory carry out test drive and interrogate fault memory again.

The following must be displayed when interrogating fault memory:

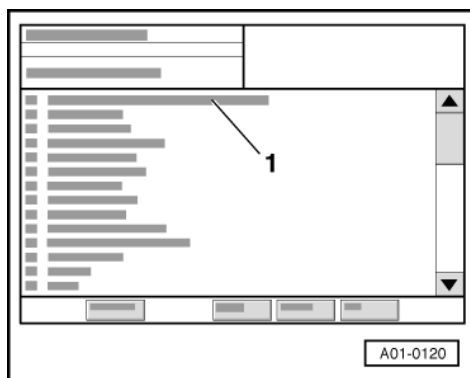
"No fault detected!"

13 - End of output

13.1 - End of output



- > Display on VAS 5051:
- Under -1- select diagnostic function "06 - End output".



- > Display on VAS 5051:
- After this display appears, switch off ignition and detach diagnostic connector.

14 - Resetting adaption values for gearbox control unit (basic setting)

14.1 - Resetting adaption values for gearbox control unit (basic setting)

Notes:

- ◆ After repairs to valve body (e.g. replacement of solenoid valves), when replacing valve body, the torque converter or the gearbox, the adaption values in gearbox control unit must be reset.
The adaption values for normal mode in the gearbox control unit are re-learned more quickly in this way after restarting.
- ◆ The adaption values in the gearbox control unit are reset if:
 - The multi-pin connector of gearbox control unit is disconnected for more than 15 minutes=>Page 12
 - The battery is disconnected for more than 15 minutes

=> Electrical System; Repair group 27



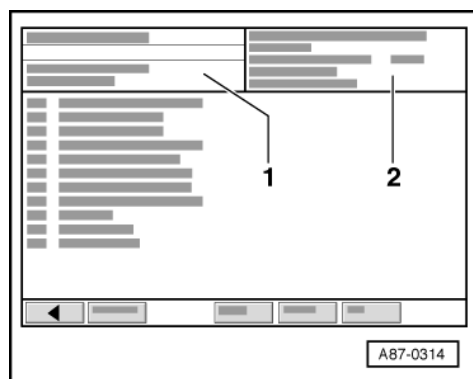
15 - Encoding control unit

15.1 - Encoding control unit

The gearbox control unit can be encoded.

Procedure

- Connect the vehicle diagnostic, testing and information system VAS 5051 => Page 21 and select vehicle system "02 - Gearbox electronics". For this purpose, the ignition must be switched on.



Note:

Encoding is only possible with ignition on and selector lever position "P" or "N". Accelerator pedal must be in idling position. Vehicle must be stationary and engine must not be started.

-> Display on VAS 5051:

- 2 - Control unit identification of gearbox control unit => Page 24 .

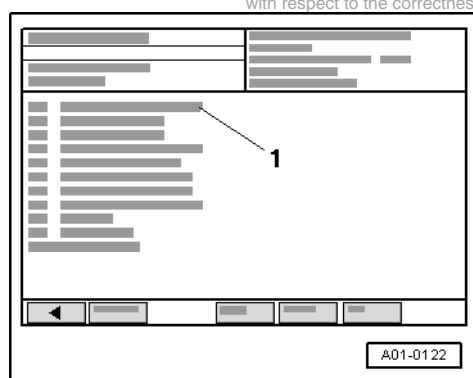
Note:

Readout of the gearbox control unit identification makes it possible to determine the gearbox/engine combination involved. It is thus possible with the help of the coding table to check whether the correct code has been entered.

- Interrogate fault memory and before encoding eliminate any faults displayed => Page 25

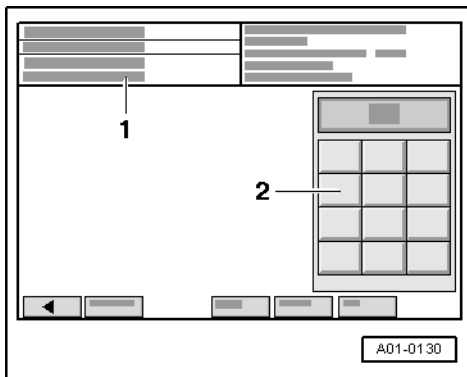
Note:

- ♦ After encoding the fault memory in the control unit is automatically erased.



-> Display on VAS 5051:

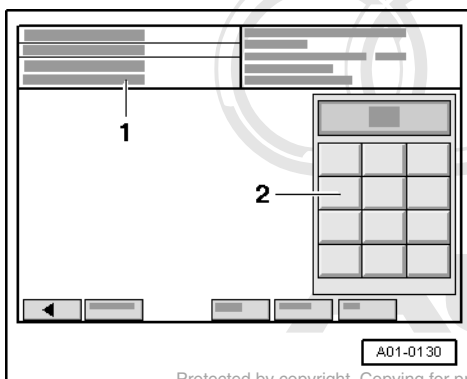
- Under -1- select diagnostic function "07 - Encode control unit".



-> Display on VAS 5051:

1 - Enter code word
max. input value = 32767

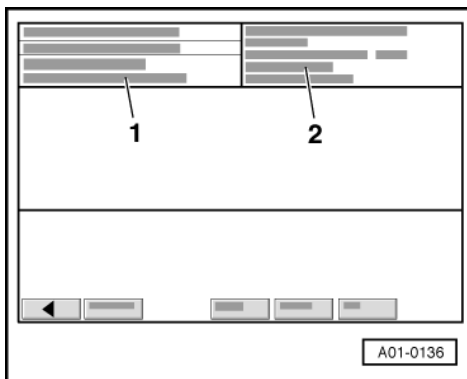
- Enter control unit code in zone -2- in line with encoding table => Page 83 .
- Confirm entry by pressing the Q key.



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-> Display on VAS 5051:

- 1 - Encoding is carried out
- Wait until the next display appears.

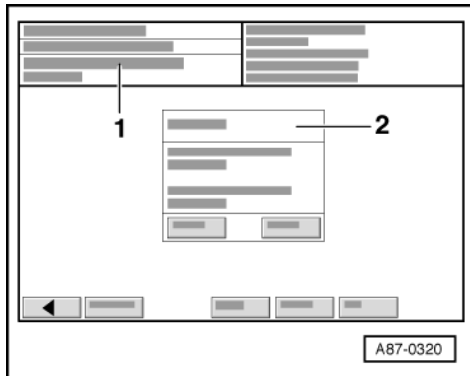




-> Display on VAS 5051:

- 1 - Encoding is carried out in the vehicle system
- 2 - Control unit identification with new code
(previous code in brackets)

- End function "07 - encode control unit" by pressing the ◀ key.



If an invalid code is entered:

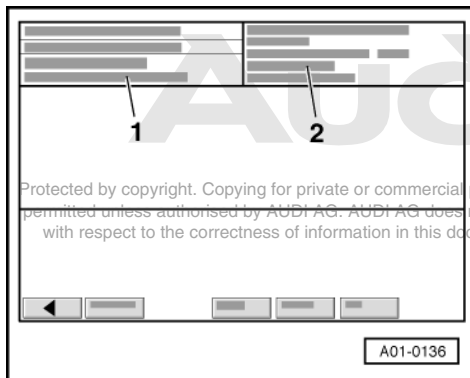
Note:

- ♦ If an invalid code number is entered the control unit retains the old coding.

-> Display on VAS 5051:

- 2 - Note: Encoding with code word XXXX not possible. Code value in vehicle is 1
(1 is the value of old coding, here e.g. 1)

or



-> Display on VAS 5051:

- 1 - Code word not accepted by vehicle system

- Repeat encoding by pressing ◀ key.

15.2 - Coding tables:

1. For vehicles without electronic throttle 3) and also for 6-cylinder TDI engines, EU-II (2.5 ltr. V6 TDI 110 kW, EU-II) with electronic throttle 4)

Coding	Engine	Tiptronic strategy	Dynamic shift program (DSP)	Market	Front-wheel drive/ four-wheel drive
00000	For all valid engine/ gearbox combina- tions without elec- tronic throttle and al- so for 6-cylinder TDI engines, EU-II (2.5 ltr. V6 TDI 110 kW, EU II) with electronic throttle For further informa- tion refer to the fol- lowing Workshop Manual:	Old strategy 1) or Vehicles without Tiptronic	DSP active	all	front-wheel and quattro drive
00010	=> Automatic Gear- box 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment		DSP not active 2)	all	front-wheel and quattro drive

The footnotes and notes for the coding table are described overleaf.

1) "New" Tiptronic strategy signifies: When selector lever is in Tiptronic gate, gearbox effects automatic upshift/downshift before governed speed is reached with the result that engine is always operated between idling and breakaway speed. Automatic downshift is also implemented if accelerator pedal is depressed as far as kickdown.

"Old" Tiptronic strategy signifies: When selector lever is in Tiptronic gate gearbox only effects upshift/downshift when selector lever is moved forwards (+) or backwards (-). If vehicle is braked to a halt, first gear is automati-
cally activated for driving off.

2) This coding must only be used for potential testing purposes. The DSP should always remain switched on if possible, as otherwise the exhaust limits will not be met.

3) Engines without electronic throttle have a mechanical throttle cable.

4) Engines with electronic throttle have no mechanical throttle cable, but have an electric throttle mechanism.

2. For vehicles with electronic throttle 3), but not for 6-cylinder TDI engines, EU-II (2.5 ltr. V6 TDI 110 kW, EU-II) with electronic throttle

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Coding	Engine	Tiptronic strategy	Dynamic shift program (DSP) 2)	Model year	Market	Front-wheel drive/four-wheel drive
00000	Impermissible code					



00001	For all valid engine/gearbox combinations with electronic throttle, except 6-cylinder TDI engines, EU-II (2.5 ltr. V6 TDI 110 kW, EU II) with electronic throttle	New 1)	DSP active		RoW	quattro drive
00002	For further information refer to the following Workshop Manual:	New 1)	DSP active	up to model year 2002	USA and Canada	quattro drive
01002	For further information refer to the following Workshop Manual:	New 1)	DSP active	as of model year 2002		
00003	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment	New 1)	DSP active		RoW	FWD drive
00004		New 1)	DSP active	up to model year 2002	USA and Canada	FWD drive
01004		New 1)	DSP active	as of model year 2002		

The footnotes and notes for the coding table are described overleaf.

1) "New" Tiptronic strategy signifies: When selector lever is in Tiptronic gate, gearbox effects automatic upshift/downshift before governed speed is reached with the result that engine is always operated between idling and breakaway speed. Automatic downshift is also implemented if accelerator pedal is depressed as far as kickdown.

"Old" Tiptronic strategy signifies: When selector lever is in Tiptronic gate gearbox only effects upshift/downshift when selector lever is moved forwards (+) or backwards (-). If vehicle is braked to a halt, first gear is automatically activated for driving off. If for testing purposes this "old" strategy is to be tested, then the code should be changed from 00001 to 00021 or from 00002 to 00022 etc. However, afterwards the coding needs to be changed back to the corresponding code specified above.

2) The DSP should always remain switched on if possible, as otherwise the exhaust limits will not be met. Therefore the codes for switching off the DSP are not given here.

3) Engines with electronic throttle have no mechanical throttle cable, but have an electric throttle mechanism.

4) As of model year 2002, only selector lever positions "P", "R", "N", "D", "S" can be selected on shift mechanism. Selection of positions "4", "3" and "2" is no longer possible, as the new shift mechanism only goes up to position "S".

16 - Reading measured value block

16.1 - Reading measured value block

Notes:

- ◆ A distinction is made between two types of gearbox.
 1. Gearbox with hydraulic control E17, in which gearbox input speed sender (inductive sender) is attached to underside of valve body.
 2. Gearbox with hydraulic control E18/2, in which gearbox input speed sender (Hall sender) is attached to gearbox housing behind valve body.
- ◆ Information on the gearbox concerned can be found in the tables in the following Workshop Manual

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Reading measured value block for gearbox with hydraulic control E17 => from Page **85**

Reading measured value block for gearbox with hydraulic control E18/2 => from Page **103**

17 - Reading measured value block for gearbox with hydraulic control E17

17.1 - Reading measured value block for gearbox with hydraulic control E17

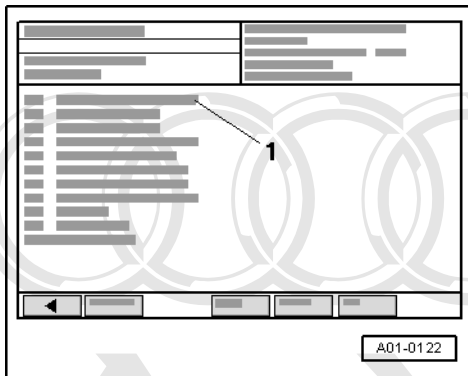
Notes:

"Reading measured value block" section for gearbox with hydraulic control E18/2 => from Page **103**

Important

To avoid danger of accident when performing measurement and test drives, observe safety precautions =>

Procedure

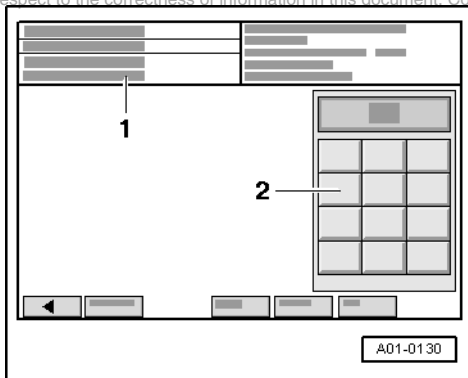


- Connect the vehicle diagnostic, testing and information system VAS 5051 => Page **21** and select vehicle system "02 - Gearbox electronics". For this purpose, the ignition must be switched on.

-> Display on VAS 5051:

Under - 1- select diagnostic function "08 - Read measured value block".

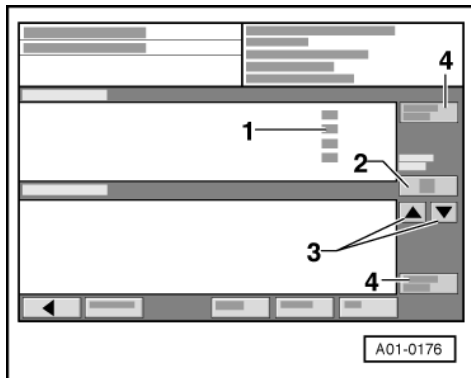
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-> Display on VAS 5051:

- 1 - Enter display group
max. input value = 255
- Enter desired "display group number" in zone -2-, =>Display group overview, Page 87 and confirm entry by pressing Q key.



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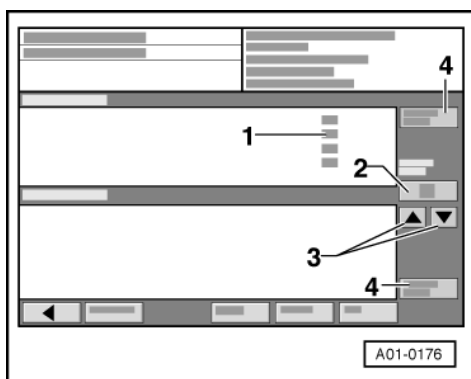
-> Display on VAS 5051:

- 1 - Display zone 1
- Display zone 2
- Display zone 3
- Display zone 4

Notes:

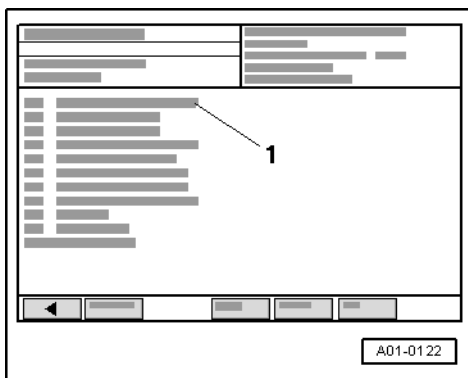
If a display zone is vacant, nothing is displayed in this line.

- 2 - The desired display group is indicated here.
- 3 - Change to a different display group by pressing these keys.
- 4 - Change to a different function (e.g. from "read measured value block" to "basic setting" and back again) by pressing the key -4-.



-> Display on VAS 5051:

- Different display group can be selected by pressing ◀ key.
- End function "08 - Read measured value block" by pressing ◀ key again.



-> Display on VAS 5051:

- Select diagnostic function "06 - End output"=> Page 79 .

List of available display group numbers for gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Details on page
001	1	Engine speed	Test table =>Page 89 onwards
	2	Gearbox input speed -G182	
	3	Gearbox speed -G38	
	4	Selected gear	
002	1	Dynamic code	
	2	Throttle flap value	
	3	Gearbox speed -G38	
	4	Selected gear	
003	1	Brake	
	2	"P" / "N" lock	
	3	Vehicle speed	
	4	Supply voltage, pin 54, 55	

Continued on next page

List of available display group numbers for gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Details on page
004	1	ATF temperature	Test table =>Page 89 onwards
	2	Selector lever position	
	3	Multi-function switch position	
	4	On-board diagnosis information 1) Torque reduction request 2)	
005	1	Solenoid valve 1 -N88	
	2	Solenoid valve 2 -N89	
	3	Solenoid valve 3 -N90	
	4	Selected gear	
006	1	Solenoid valve 4 -N91: specified current	
	2	Solenoid valve 5 -N92: specified current	
	3	Solenoid valve 6 -N93: specified current	
	4	Selected gear	

- 1) Only for vehicles with CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to



=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

2) Only for vehicle models with no CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Continued on next page

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List of available display group numbers for gearbox with hydraulic control E17

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Display group no.	Display zone	Designation	Details on page
007	1	ATF temperature	Test table =>Page 89 onwards
	2	Solenoid valve -N94: specified current	
	3	Converter clutch	
	4	Converter slip speed	
008	1	Kickdown switch	
	2	Throttle flap value	
	3	Engine torque in Nm 1)	
	4	Throttle valve duty cycle in % 2) Overrun/traction operation	

1) Only for vehicles with CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

2) Only for vehicle models with no CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Continued on next page

List of available display group numbers for gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Details on page
009 1)	1	Motor torque	Test table =>Page 89 onwards
	2	Maximum engine torque	
	3	Engine speed	
	4	Throttle flap value	
009 2)	1	Motor torque	
	2	Engine speed	
	3	Throttle flap value	
	4	Fuel consumption signal	
010	1	Torque increase in converter	
	2	Engine speed	
	3	Selected gear	
	4	Traction control system (TCS)	

Display group no.	Display zone	Designation	Details on page
011	1 2 3 4	Selector lever position Tiptronic recognition Tiptronic switch -F189 (upshift/downshift position) Air conditioner compressor shutoff with kickdown	

1) Only for vehicles with CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

2) Only for vehicle models with no CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

17.2 - Test table for gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001	1	Engine speed	With engine running	approx. 0...8200 rpm	Carry out electrical test => Page 21 replace if necessary Check fault codes for engine control unit and check identification if necessary
	2	Gearbox input speed -G182	During driving with selected gear1)	...rpm	- See fault table, fault code 17100 / P0716 => Page 26
	Continued ▼		R	approx. 0...10	
			1M	approx. 0...10	

1) During driving: A second mechanic is required to read specified values.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001	2	Gearbox input speed - G182	1 With throttle applied	approx. 0...10	- Carry out electrical test => Page 136 - Read measured value block, display group no. 007 and determine during driving which elements are defective or not activated
			1 On overrun	approx. 0...300	
			2	approx. 0...4000 1)	



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼			3	approx. 0...8200 ¹⁾	
			4	approx. 0...8200 ¹⁾	
			5	approx. 0...8200 ¹⁾	

1) Display should behave in line with engine speed in display zone 1, i.e. gearbox input speed should increase/decrease with increasing/decreasing engine speed.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001 (cont.) ▼	3	Gearbox speed - G38 2)	During driving with selected gear1)rpm 3)	- See relevant fault code for gearbox speed sender -G38 (-G195) 2)
			R	approx. 0...2000	- Carry out electrical test => Page 136
			1M, 1	approx. 0...1200	- Read measured value block, display group no 007
			2	approx. 0...4000	
			3	approx. 0...5800	
			4	approx. 0...8200	
			5	approx. 0...8200	- and check in drive operation which elements are defective or not activated

Notes and footnotes for display zones 1 - 3 of display group number 001 can be found on next page.

- 1) During driving: A second mechanic is required to read specified values.
- 2) Also referred to as gearbox output speed sender -G195.
- 3) Display should behave in line with engine speed in display zone 1, i.e. gearbox speed (output speed) should increase/decrease with increasing/decreasing engine speed.

Notes on display group no. 001, display zone 1 to 3,

- ♦ Test conditions: The switching process must be completed. Vehicle not in overrun operation (no driving downhill or engine brake).

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001	4	Selected gear	During driving 1)	Selector lever position	- Check solenoid valves. See display group numbers 005 and 006 - See fault table, fault codes of appropriate solenoid valves - Check selector lever position. Enter display group number 004
				"N"	
				"R"	
				"D"	
				"4"	
				"3"	
				"2"	

Notes and footnotes for display zone 4 of display group number 001 can be found on next page.

- 1) During driving: A second mechanic is required to read specified values.
- 2) The gearbox control unit is equipped with an automatic gear change. The display shows the forwards gear that the gearbox control unit would activate if the selector lever were to be moved into selector lever position "D".

Notes on "gear engaged":

- ◆ Defective solenoid valves or other faults identified by the diagnosis may prevent a particular gear from being engaged.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
002	1	Dynamic code (of dynamic shift program)	During normal driving 1)	0	Determined by driving style and road conditions (acceleration, movement of accelerator pedal, speed and load)
			maximum value (very "sporty")	240	
			Warming up program is activated	241	High values move the shift points up to higher engine rpm
			Anti-slip control activated	242	
			Tiptronic recognition activated	243	- See relevant fault codes for Tiptronic switch -F189

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
			CCS (cruise control system) map	244	Applies to US vehicles only; can be disregarded at present

1) During driving: A second mechanic is required to read specified values.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
002	2	Throttle valve value 3)	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased
			Full throttle	99...100 %	- Carry out electrical test => Page 136 See appropriate fault codes for throttle valve potentiometer - G69/accelerator position sender -G79
	3	Gearbox speed - G382)	During driving 1)	0...8200	- See relevant fault code for gearbox speed sender -G38 (-G195) 2) See display group number 001
	4	Selected gear	See display group number 1, display zone 4		

1) During driving: A second mechanic is required to read specified values.

2) Also referred to as gearbox output speed sender -G195.

3) On vehicles with a V6 TDI engine the pedal position value from accelerator position sender -G79 is displayed here.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
003	1	Brake light switch -F	Brake not actuated	-	- Refer to appropriate fault code for brake light switch -F - Carry out electrical test => Page 136
			Brake actuated	Brake	
	2	Selector lever lock solenoid -N110 2)	Stationary, Selector lever in	P N active	- Refer to appropriate fault code for selector lever lock solenoid -N110 2)

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼			Position P or N Brake actuated	P N not active	- Check solenoid for selector lever lock - N110. Carry out electrical test => Page 136
	3	Vehicle speed	During driving 1)	...km/h	Display of speedometer and values at V.A.G 1551 can differ slightly If necessary, check sender for speedometer -G22

- 1) During driving: A second mechanic is required to read specified values.
- 2) Selector lever lock solenoid -N110 is also referred to as selector lever lock => solenoid -N110.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
003	4	Voltage supply term. 15	Stationary min.	10.0 V	- Carry out electrical test => Page 136
			max.	16.0 V	- See fault table, fault code 00532 => Page 26
004 (cont.) ▼	1	ATF temperature	Stationary with engine running	...°C	- Carry out electrical test => Page 136 Refer to relevant fault code for gearbox oil temperature sender -G93

Notes on ATF temperature

- ◆ A recognised temperature of minus 50 °C indicates a short to earth
- ◆ A recognised temperature of 180 °C indicates a short to positive or open circuit.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004	2	Selector lever position (multi-function switch - F125 1))	Stationary P	P	Check multi-function switch - F125 Display group no. 004 - Carry out electrical test => Page 136 Check correspondence with display in dash panel insert
			Selector- R	R	
			lever N	N	
			in D	D	
			4	4	



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼			3	3	- If necessary, adjust selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism
			2	2	

1) Multi-function switch -F125 is also known as drive stage sender -F125.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004 (cont.) ▼	3	Multi-function switch -F125 1)	Stationary Selector lever position	L1 L2 L3 L4	- Refer to appropriate fault code for multi-function switch -F125 1) - Check multi-function switch -F125 - Carry out electrical test => Page 136 - If necessary, adjust selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism
			P	1000	
			R	0100	
			N	1110	
			D	1011	
			4	0111	
			3	0001	
			2	0010	

1) Multi-function switch -F125 is also known as drive stage sender -F125.

Notes on display zone 3, display group number 004:

- ♦ Input signals of the multi-function switch -F125 1) can be checked at gearbox control unit.

	Display zone 3: (from left to right)			
	L 1	L 2	L 3	L 4
Line connection to control unit -J217	Contact 36 of -J217	Contact 8 of -J217	Contact 37 of -J217	Contact 9 of -J217

1) Multi-function switch -F125 is also known as drive stage sender -F125.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004 without CAN bus	4	Engine intervention (modulation of ignition timing)	During driving 1) Engine speed signal OK		- See fault table, fault code 00545, 18192 and 18193 => Page 26 - Carry out electrical test => Page 136 Check wiring to engine control unit - Only replace gearbox control unit -J217- if necessary => Page 3
			is switched on	Engine interference	
			is switched off	-	

1) During driving: A second mechanic is required to read specified values.

Note for display zone 4 of display group number 004 can be found on next page.

Notes on display zone 4 of display group number 004:

- ♦ This display zone 4 only applies to vehicles without CAN bus. See display zone 4 on next page for vehicles with CAN bus. A)
- ♦ Motor input is only activated during a switching procedure. Depending on the driving conditions, the period of activation may be very brief, and because the signal to the V.A.G 1551 is relatively slow there may be situations where a brief reduction of torque is not registered.

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Applicable only to gearbox with hydraulic control E17

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004 with CAN bus	4	Information in on-board diagnosis: Display reading from left to right	During driving 1)		Can be ignored
		Malfunction display	switched on	1	
			switched off	0	
		Trip	completed	1	
			not completed	0	
		Gearbox warm-up	completed	1	
			not completed	0	
		Engine start	recognised	1	



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
			not recognised	0	

1) During driving: A second mechanic is required to read specified values.

Note for display zone 4 of display group number 004 => can be found on next page.

Notes on display zone 4 of display group number 004:

- ♦ This display zone (4) only applies to vehicles with CAN data bus. See display zone 4 on preceding page for vehicles without CAN data bus. A)

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Applicable only to gearbox with hydraulic control E17

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
005 (cont.) ▼	1	Solenoid valve 1 - N88 2)	During driving 1) Selected gear R, 5, 2, 1, 1M 3, 4		- Refer to appropriate fault code for solenoid valve 1 -N88 2) - Carry out electrical test => Page 136
				1	
				0	
	2	Solenoid valve 2 - N89 3)	During driving 1) Selected gear 3, 2, 1 R, 1M, 4, 5		- Refer to appropriate fault code for solenoid valve 2 -N89 3) - Carry out electrical test => Page 136
				1	
				0	

1) During driving: A second mechanic is required to read specified values.

2) Solenoid valve 1 -N88 is also referred to as switch valve 1 =>solenoid valve 1 -N88.

3) Solenoid valve 2 -N89 is also referred to as switch valve 2 =>solenoid valve 2 -N89.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
005	3	Solenoid valve 3 - N90 2)	During driving 1) Selected gear 3, 4, 5 R, 1, 1M, 2		- Refer to appropriate fault code for solenoid valve 3 -N90 2) - Carry out electrical test => Page 136
				X	
				0	

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
	4	Selected gear	See display group number 1, display zone 4		

1) During driving: A second mechanic is required to read specified values.

2 Solenoid valve 3 -N90 is also referred to as switch valve 3 =>solenoid valve 3 -N90.

Notes on display group no. 005, display zone 1 to 3:

- ♦ A "0" on the display indicates an inactive solenoid valve, and a "1" indicates an active solenoid valve.
- ♦ Variably activated solenoid valves are indicated by "X".

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
006	1	Specified current of solenoid valve 4 -N91 2)	During driving 1)		- See fault table, fault code 00264 or for 6-cyl TDI fault code 18222 and 18223 => Page 26
				min 0.1 A	- Carry out electrical test => Page 136
				max 0.8 A	
	2	Specified current of solenoid valve 5 -N92 3)	During driving 1)		- See fault table, fault code 00266 or for 6-cyl TDI fault code 18227 and 18228 => Page 26
				min 0.1 A	- Carry out electrical test => Page 136
				max 0.8 A	
(cont.) ▼					

1) During driving: A second mechanic is required to read specified values.

2) Solenoid valve 4 -N91 is also referred to as pressure control valve 1 -N215.

3) Solenoid valve 5 -N92 is also referred to as pressure control valve 2 -N216.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
006	3	Specified current of solenoid valve 6 -N93 2)	During driving 1)		- See fault table, fault code 00268 or for 6-cyl TDI fault code 18232 and 18233 => Page 26
				min 0.1 A	- Carry out electrical test => Page 136
				max 0.8 A	

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
	4	Selected gear	See display group number 001, display zone 4		

1) During driving: A second mechanic is required to read specified values.

2) Solenoid valve 6 -N93 is also referred to as pressure control valve 3 -N217.

Notes on nominal value of solenoid valves:

- ♦ Defective solenoid valves/clutches or other faults may prevent a particular gear from being engaged.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
007 (cont.) ▼	1	ATF temperature	Stationary with engine running. Substitute value is output if temperature sender is defective	...°C	- Check gearbox oil temperature sender (ATF) -G93; Perform electrical test=> Page 136
	2	Specified current of solenoid valve 7 - N94 2)	During driving 1)	min. 0.1 A	- See fault table, fault code 00270 or for 6-cyl TDI fault code 18237 and 18238 => Page 26
				max. 0.8 A	- Carry out electrical test => Page 136
	3	Converter clutch	During driving 1)	TC open	- See fault table, fault code 01192 or for 6-cyl TDI fault code 17125 => Page 26
				TC ctrl.	- Carry out electrical test => Page 136
				TC closed	

1) During driving: A second mechanic is required to read specified values.

2) Solenoid valve 7 -N94 is also referred to as pressure control valve 4 -N218.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
007 <small>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.</small>	4	Converter slip speed	During driving 1) TC open	0.....Fixed brake speed	- See fault table, fault code 00297, 00660 and 01192 or for 6-cyl TDI fault code 17106 and 17125 => Page 26

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
			TC ctrl. (last switching process at least 20 seconds before)	20...120 rpm	- Determine which element is defective or no longer activated; gearbox with switching elements => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Gearbox with selector elements Gearbox with selector elements
			TC closed	0...10 rpm	- Check plausibility between engine, gearbox input and gearbox speed; display group no. 001

1) During driving: A second mechanic is required to read specified values.

Notes for display zone 4 of display group number 007 can be found on next page.

Test conditions for converter slip speeds:

- ♦ "TC closed": The switching process must be completed (wait at least 1 second), the converter bridging clutch (TC) must be closed and the accelerator value must be constant.
- ♦ "TC ctrl.": The values specified apply when the control phase of the torque converter clutch is stabilised. Under unfavourable conditions (e.g. acceleration uphill) this condition is only reached 20 seconds after the switching process is completed. During this controlling phase slip values of up to 350 rpm may be reached.
- ♦ Excessively high torque converter slip speeds may also indicate slipping clutches or non-activation of selector elements.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
008	1	Kickdown switch - F8	Kick down actuated	Kickdown	- Check kickdown switch, carry out electrical test => Page 136
			not actuated	-	
	2	Throttle valve value 1)	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased
(cont.) ▼			Full throttle	99...100 %	- Carry out electrical test => Page 26

1) On vehicles with a V6 TDI engine the pedal position value from accelerator position sender -G79 is displayed here.



Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
008	3 3) without CAN bus	Throttle valve duty cycle	Stationary Idling	below 30%	When accelerating from idling to full throttle the % value is continually increased
			Full throttle	greater than 70%	- Carry out electrical test => Page 26
(cont.) ▼	3 2) with CAN bus	Engine torque	During driving 1	...Nm	The signal for the engine torque is sent to the gearbox control unit by the engine control unit via the CAN-Bus-line

Notes and footnotes for display group number 008 can be found on next page.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
008	4	Overrun/traction signal	During driving 1)	Overrun	When driving downhill or delay (engine brake)
			Traction operation	-	During normal driving, engine provides power

1) During driving: A second mechanic is required to read specified values.

2) Only for vehicles with CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

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=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

3) Only for vehicle models with no CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
009 with CAN bus	1	Motor torque	During driving 1)	...Nm	The signal for the motor torque is sent to the gearbox control unit by the engine control unit via the CAN-Bus-line

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
	2	Maximum engine torque	During driving 1)	...Nm	(Reduced) engine torque requested by gearbox control unit during gearshift 2)
	3	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 00529 and 00543 => Page 26
	4	Throttle valve value 3)	Stationary Idling 1)	0...1 %	When accelerating from idling to full throttle the % value is continually increased
			Full throttle	99...100 %	- See fault table, fault code 00518 => Page 26

Footnotes and notes on display group number 009 for vehicles with CAN bus can be found on next page.

- 1) During driving: A second mechanic is required to read specified values.
- 2) When driving in one gear the switching torque displayed is constantly high as no engine torque reduction is required.
- 3) On vehicles with a V6 TDI engine the pedal position value from accelerator position sender -G79 is displayed here.

Notes on display group number 009:

- ♦ This display group 009 only applies to vehicles with CAN bus. See display group number 009 on next page for vehicles without CAN bus. A)

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
009 without CAN bus	1	Motor torque	During driving 1)	...Nm	Gearbox control unit calculates engine torque from fuel consumption signal and engine speed signal
	2	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 00529 and 00543 => Page 136
	3	Throttle valve value 2)	See display group number 002, display zone 2		



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
	4	Fuel consumption signal ("high" time)	During driving 1)	...ms	Can be ignored.

1) During driving: A second mechanic is required to read specified values.

2) On vehicles with a V6 TDI engine the pedal position value from accelerator position sender -G79 is displayed here.

Notes on display group number 009 => can be found on next page.

Notes on display group number 009:

- This display group number (009) only applies to vehicles with no CAN bus. See display group number 009 on preceding page for vehicles with CAN bus. A)
- On vehicles with Motronic injection and ignition system, engine torque information is transmitted from the engine control unit. On these vehicles the fuel consumption signal is not available, or is displayed constantly as "00ms".

A) A distinction is made between vehicle models with and without CAN bus. For precise definition of which vehicles are equipped with CAN bus refer to

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
010	1	Torque increase in converter	During driving 1)	1...2.17	Is calculated by the engine control unit from the converter slip speed
	2	Engine speed	With engine running	approx. 0...8200 rpm	- Carry out electrical test => Page 26
	3	Selected gear	See display group number 001, display zone 4		
	4	Traction control system (TCS)	During driving 1) activated	TCS active	Activated by TCS control unit - only when required
			not activated	-	

1) During driving: A second mechanic is required to read specified values.

Applicable only to gearbox with hydraulic control E17

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
011	1	Selector lever position	See display group number 004, display zone 2		
	2	Tiptronic switch - F189 (Tiptronic recognition)	Selector lever in Tiptronic gate	M-switch	- Carry out electrical testing => as of Page 136

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
	3	Tiptronic switch - F189 (upshift/downshift position)	Selector lever not in Tiptronic gate	-	- Carry out electrical testing => as of Page 136
			Select selector lever in Tiptronic gate and gears	Upshift switch	
			Upshift 3) Downshift 2)	Downshift switch	
	4	Air conditioner compressor shutoff with kickdown	During driv- activated ing 1)	Compr. OFF	Air conditioner compressor shutoff is only activated after kickdown downshift
			not activated	Compr. ON	

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Notes and footnotes for display group number 011 can be found on next page.

- 1) During driving: A second mechanic is required to read specified values.
- 2) Operate the downshift switch (-) by slightly pressing the selector lever backwards. On vehicles equipped with a Tiptronic sports steering wheel the downshift switch must additionally be operated by slightly touching the lower left/right button (-) on steering wheel for checking function.
- 3) Operate the upshift switch (+) by slightly pressing the selector lever forwards. On vehicles equipped with a Tiptronic sports steering wheel the upshift switch must additionally be operated by slightly touching the upper left or right button (+) on steering wheel for checking function.

18 - Reading measured value block for gearbox with hydraulic control E18/2

18.1 - Reading measured value block for gearbox with hydraulic control E18/2

Notes:

"Reading measured value block" section for gearbox with hydraulic control E17 => from Page 85

Important
To avoid danger of accident when performing measurement and test drives, observe safety precautions =>

Procedure

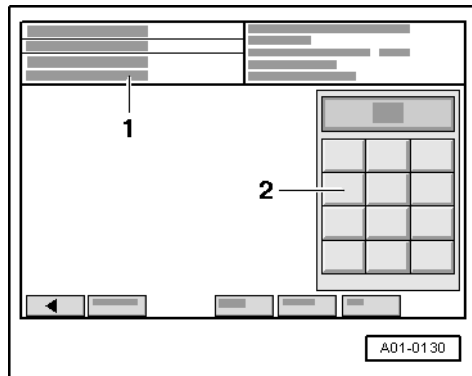




- Connect the vehicle diagnostic, testing and information system VAS 5051 => Page 21 and select vehicle system "02 - Gearbox electronics". For this purpose, the ignition must be switched on.

-> Display on VAS 5051:

- Under -1- select diagnostic function "08 - Read measured value block".

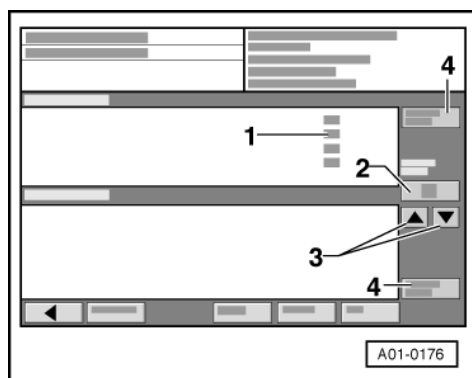


-> Display on VAS 5051:

- 1 - Enter display group
max. input value = 255

- Enter desired "display group number" in zone -2- => Display group overview, Page 87 and confirm entry by pressing Q key.

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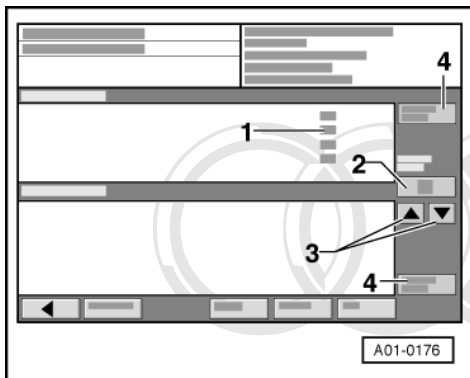
-> Display on VAS 5051:

- 1 - Display zone 1
Display zone 2
Display zone 3
Display zone 4

Notes:

If a display zone is vacant, nothing is displayed in this line.

- 2 - The desired display group is indicated here.
- 3 - Change to a different display group by pressing these keys.
- 4 - Change to a different function (e.g. from "read measured value block" to "basic setting" and back again) by pressing the key -4-.

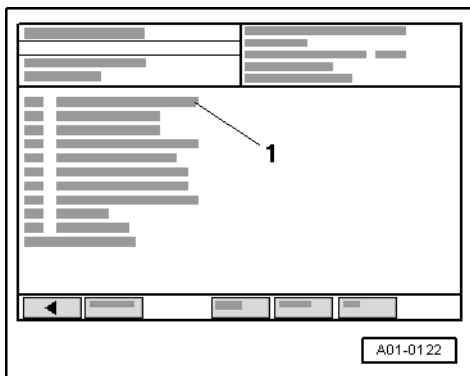


-> Display on VAS 5051:

- A different display group can be selected by pressing ◀ key.

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- End function "08 - Read measured value block" by pressing ▶ key again.



-> Display on VAS 5051:

- Select diagnostic function "06 - End output"=> Page 79 .

List of available display group numbers for gearbox with hydraulic control E18/2

Display group no.	Display zone	Designation	Details on page
001	1	Engine speed	Test table =>Page 107 onwards
	2	Gearbox input speed -G182	
	3	Gearbox output speed -G195	
	4	Selected gear	
002	1	Current program	
	2	Throttle valve/accelerator pedal position	
	3	Gearbox output speed -G195	
	4	Selected gear	
003	1	Brake light switch	
	2	"P" / "N" lock	
	3	Vehicle speed	
	4	Power supply	



Display group no.	Display zone	Designation	Details on page
004	1	ATF temperature	
	2	Selector lever position	
	3	Multi-function switch position	
	4	On-board diagnosis information	

Continued on next page

List of available display group numbers for gearbox with hydraulic control E18/2

Display group no.	Display zone	Designation	Details on page
005	1	Solenoid valve 1 -N88	Test table =>Page 107 onwards
	2	Solenoid valve 2 -N89	
	3	Solenoid valve 3 -N90	
	4	Selected gear	
006	1	Nominal current of pressure control valve 1 -N215	
	2	Nominal current of pressure control valve 2 -N216	
	3	Nominal current of pressure control valve 3 -N217	
	4	can be ignored.	
007	1	ATF temperature	
	2	Nominal current of pressure control valve 4 -N218	
	3	Converter clutch	
	4	Converter slip speed	
008	1	Kickdown switch	
	2	Throttle valve/accelerator pedal position	
	3	Overrun/traction operation	
	4		

Continued on next page

List of available display group numbers for gearbox with hydraulic control E18/2

Display group no.	Display zone	Designation	Details on page
009	1	Motor torque	Test table =>Page 107 onwards
	2	Engine speed	
	3	Throttle valve/accelerator pedal position	
	4		
010	1	Torque increase in converter	
	2	Engine speed	
	3	Selected gear	
	4		
011	1	Selector lever position	
	2	Tiptronic recognition	
	3	Tiptronic switch -F189 (upshift/downshift position)	
	4		
012	1	Type of driving, under load	
	2	Dynamic code	
	3	Drive resistance index	
	4	Driver evaluation	
125	1	Reception of engine messages via CAN bus	
	2		
	3	Reception of ABS messages via CAN bus	
	4		

18.2 - Test table for gearbox with hydraulic control E18/2, overview

There are two different test tables:

- ◆ Test table up to model year 2001 =>Page **107** onwards.
- ◆ Test table as of model year 2002 =>Page **119** onwards.

As of model year 2002, only selector lever positions "P", "R", "N", "D", "S" can be selected on shift mechanism. Selection of positions "4", "3" and "2" is no longer possible.

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18.3 - Testtable for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001 (cont.) ▼	1	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 17968 / P1560 => Page 26
	2	Gearbox input speed -G182	During driving with selected gear1)	...rpm	- See fault table, fault code 17100 / P0716 => Page 26
				R approx. 0...8200	
				1, 1m approx. 0...2000	- Read measured value block, Display group numbers 006/007 and determine during driving which elements are defective or not activated
				2 approx. 0...8200	
				3 approx. 0...8200	

- 1) During driving: A second mechanic is required to read specified values.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001	2		During driving 1) with gear selected	...rpm	- See previous page
				4 approx. 0...8200	
				5 approx. 0...8200	
	3	Gearbox output speed -G195	During driving with selected gear1)	...rpm	- See fault table, fault code 17105 / P0721 => Page 26
				R approx. 0...2000	



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼			1, 1m	approx. 0...2000	- Read measured value block, display group numbers 006/007 - and check in drive operation which elements are defective or not activated
			2	approx. 0...4000	
			3	approx. 0...5800	
			4	approx. 0...8200	
			5	approx. 0...8200	

1) During driving: A second mechanic is required to read specified values.

Notes on display group no. 001, display zone 1 to 3,

- ♦ Test conditions: The switching process must be completed. Vehicle not in overrun operation (no driving downhill or engine brake).

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001	4	Selected gear	During driving 1) Selector lever position		- Check solenoid valves. See display group numbers 005, 006 and 007 - See fault table, fault code of corresponding solenoid valves => Page 26 - Check selector lever position. Enter display group number 004
			"N"	"1" ... "5" "2"	
			"R"	"R"	
			"D"	"1m" "2" "3" "4" "5"	
			"4"	"1m" "2" "3" "4"	
			"3"	"1m" "2" "3"	
			"2"	"1m" "2"	

1) During driving: A second mechanic is required to read specified values.

2) The gearbox control unit is equipped with an automatic gear change. The forward gear is displayed which the gearbox control unit would have actuated during a driving stage change in selector lever position "D".

Notes on display zone 4, display group number 001:

- ♦ Defective solenoid valves or other diagnosed faults may prevent the selection of a certain gear.

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
002 (cont.) ▼	1	Current program	During normal driving 1)		Determined by driving style and road conditions (acceleration, movement of accelerator pedal, speed and load)
			Dynamic shift program is activated	DS	Shifting is avoided as much as possible
			Warming up program is activated	WL	Upshift takes place more quickly to avoid high engine speeds
			Anti-slip control activated	AS	- Check display group number 004
			Tiptronic recognition activated	TT	- See fault table, fault code 18141 / P1733 to 18152 / P1744 => Page 26

1) During driving: A second mechanic is required to read specified values.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
002	2	Throttle valve value/accelerator position sender value	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased
			Full throttle	99...100 %	- Carry out electrical testing => as of Page 26
	3	Gearbox output speed -G195	During driving 1)	0...8200	- See fault table, fault code 17105 / P0721 => Page 26 See display group number 001
	4	Selected gear	See display group number 001, display zone 4		

1) During driving: A second mechanic is required to read specified values.

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
003	1	Brake light switch -F	actuated	Brake	- See fault table, fault code 17087 / P0703 => Page 26
			not actuated	-	- Carry out electrical testing => as of Page 136
	2	Solenoid for selector lever lock -N110	Stationary Brake not operated in P, N	P N active	- See fault table, fault code 18170 / P1762 and 18196 / P1761 => Page 26



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼			Brake actuated	P N not active	- Check solenoid for selector lever lock - N110. Carry out electrical test => Page 136

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
003	3	Vehicle speed	During driving 1)	...km/h	- If necessary, check sender for speedometer -G22
	4	Voltage supply term. 15	Stationary min.	10.0 V	- Carry out electrical test => Page 136
			max.	16.0 V	- See fault table, fault code 18158 / P1750 and 18159 / P1751 => Page 26

1) During driving: A second mechanic is required to read specified values.

Note on display zone 3 "vehicle speed":

Display of speedometer and values at VAS 5051/V.A.G 1551 can differ slightly.

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004 (cont.) ▼	1	ATF temperature	Stationary with engine running	... °C	- Carry out electrical test => Page 26

Notes on ATF temperature

- ♦ A measured temperature of minus 50°C indicates a short to earth,
- ♦ a measured temperature of 180°C indicates a short to positive or open circuit.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004	2	Selector lever position - (Multi-function switch - F125)	Stationary P	P	- Check multi-function switch -F125. Display group no. 004, display zone 3
			Selector- R	R	- Carry out electrical test => Page 136
			lever N	N	Check correspondence with display in dash panel insert
			in D	D	

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
	(cont.) ▼		4	4	- If necessary, adjust selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism; Checking and adjusting selector lever cable
			3	3	
			2	2	

Display group no.	Display zone	Designation	Test conditions		Display on VAS 5051 specified value	Action in the event of deviation from specified value
004 (cont.) ▼	2 1)	Selector lever position - (Multi-function switch -F125) intermediate positions for selector lever mechanism	With vehicle stationary, gear selector lever between	P and R or R and D	Z1	- Check multi-function switch -F125. Display group no. 004, display zone 3
				N and D	Z2	- Carry out electrical test => Page 136
				D and 4	Z3	- If necessary, adjust selector lever cable
				4 and 3 or 3 and 2	Z4	=> Automatic Gear-box 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism; Checking and adjusting selector lever cable

1) This display zone is only used as of model year 2000 (May 1999).

Note for intermediate positions:

If the gear selector lever is moved to one of the indicated intermediate positions then "Z1", "Z2", "Z3" or "Z4" will appear on the fault reader. The display on the dash panel insert must not display a selected gear, i.e. only PRND432 is displayed, without a gear being illuminated.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004	3	Multi-function switch (drive stage Sender) -F125	Stationary Selector lever position	L1 L2 L3 L4	- See fault table, fault code 17090 / P0706 => Page 26
			P	1000	- Check multi-function switch -F125
			R	0100	- Carry out electrical test => Page 136
			N	1110	- If necessary, adjust selector lever cable
			D	1011	

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼			4	0111	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism
			3	0001	
			2	0010	

Notes on display zone 3, display group number 004:

- ♦ The input signals of the multi-function switch -F125 can be checked at the gearbox control unit.

Line connection to control unit -J217	Display zone 3: (from left to right)			
	L 1	L 2	L 3	L 4
	Contact 36 of -J217	Contact 8 of -J217	Contact 37 of -J217	Contact 9 of -J217

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004	4	Information in on-board diagnosis: Display reading from left to right	During driving 1)		Can be ignored
		Malfunction display	switched on	1	
			switched off	0	
		Trip	completed	1	
			not completed	0	
		Gearbox warm-up	completed	1	
			not completed	0	
		Engine start	recognised	1	
			not recognised	0	

1) During driving: A second mechanic is required to read specified values.

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
005	1	Solenoid valve 1 - N88	During driving 1) Selected gear		- Compare display with position of selector elements

(cont.) ▼	2	Solenoid valve 2 - N89	R, N, D (1st, 2nd and 5th gear), 2 (1st gear), D (downshift 5th to 4th gear)	X	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements
			D (3rd and 4th gear)	0	
			During driving 1) Selected gear		- See fault table, fault codes 17140 / P0756, 17141 / P0757 and 17142 / P0758 => Page 26
			N, D (1st, 2nd and 3rd gear)	X	
			R, D (4th and 5th gear), D (downshift 5th to 4th gear)	0	

1) During driving: A second mechanic is required to read specified values.

Notes on display group no. 005, display zone 1 to 3;

- ◆ Not switched (inactive) solenoid valves are displayed with "0", switched (active) solenoid valves with "X".

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
005	3	Solenoid valve 3 - N90	During driving 1) Selected gear		- Compare display with position of selector elements
			D (downshift 5th to 4th gear)	X	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements
			D (3rd, 4th and 5th gear) 2)	X or 0 2)	
			R, N, D (1st and 2nd gear), 2 (1st gear)	0	
	4	Selected gear	See display group number 001, display zone 4		

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1) During driving: A second mechanic is required to read specified values.

2) The solenoid valve is actuated briefly during driving, i.e. the state changes from display "0" to "X" and back again to "0". Shifting in these gears is not functionally relevant.

Notes on display group no. 005, display zone 1 to 3;

- ◆ Not switched (inactive) solenoid valves are displayed with "0", switched (active) solenoid valves with "X".

Test table for gearbox with hydraulic control E18/2 up to model year 2001



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
006 (cont.) ▼	1	Nominal current of pressure control valve 1 -N215	During driving 1)		- See fault table, fault code 18222 / P1814 and 18223 / P1815 => Page 26
				min 0.0 A	- Carry out electrical test => Page 136
				max 2.0 A	
	2	Nominal current of pressure control valve 2 -N216	During driving 1)		- See fault table, fault code 18227 / P1819 and 18228 / P1820 => Page 26
				min 0.0 A	- Carry out electrical test => Page 136
				max 2.0 A	

1) During driving: A second mechanic is required to read specified values.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
006	3	Nominal current of pressure control valve 3 -N217	During driving 1)		- See fault table, fault code 18232 / P1824 and 18233 / P1825 => Page 26
				min 0.0 A	- Carry out electrical test => Page 136
				max 2.0 A	
	4				can be ignored at present

1) During driving: A second mechanic is required to read specified values.

Notes on nominal value of solenoid valves:

- ♦ Defective solenoid or pressure control valves or clutches or other faults can prevent the selection of a certain gear.

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
007	1	ATF temperature	See display group number 004, display zone 1		
	2	Nominal current of pressure control valve 4 -N218	During driving 1)	0.0 A	- See fault table, fault code 18237 / P1829 and 18238 / P1830 => Page 26
				max. 2.0 A	- Carry out electrical test => Page 136

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼	3	Converter clutch	During driving 1)	TC open	- See fault table, fault code 17125 / P0741 => Page 26
				TC ctrl.	- Carry out electrical test => Page 136
				TC closed	

1) During driving: A second mechanic is required to read specified values.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
007	4	Converter slip speed	During driving 1) TC open	0.....Fixed brake speed	- Check ATF-oil level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/ changing ATF 26
			TC ctrl. (last switching process at least 20 seconds before)	20...120 rpm	- Determine which element is defective or no longer activated; gearbox with switching elements => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission Overview of transmission
			TC closed	0...20 rpm	- Check comparative plausibility of engine speed, gearbox input speed and gearbox output speed; display group number 001

1) During driving: A second mechanic is required to read specified values.

Note:

- ◆ Test conditions for converter slip speeds => next page

Test conditions for converter slip speeds:

- ◆ "TC closed": The switching process must be completed (wait at least 1 second), the converter bridging clutch (TC) must be closed and the accelerator value must be constant.
- ◆ "TC ctrl.": The values given are valid for the "controlled condition" of the converter clutch. Under unfavourable conditions (e.g. acceleration uphill) this condition is only reached 20 seconds after the switching process is completed. During this controlling phase slip values of up to 350 rpm may be reached.
- ◆ Converter slip speeds which are too high may also indicate slipping clutches or not activated switching elements.

Test table for gearbox with hydraulic control E18/2 up to model year 2001



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
008	1	Kickdown switch - F8	Kick down actuated 2)	Kickdown	- Check kickdown switch, carry out electrical test => Page 136
			not actuated	-	
	2	Throttle valve value/accelerator position sender value	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased - See fault table, fault code 18269 / P1861 => Page 26 See also display group number 002, display zone 2
			Full throttle	99...100 %	
	3	Overrun/traction signal	During driving 1) Overrun operation	Overrun	When driving downhill or delay (engine brake) During normal driving, engine provides power
			Traction operation	-	

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1) During driving: A second mechanic is required to read specified values.

2) 'Activate kickdown' means that you need to press the accelerator pedal down as far as it will go. At the same time, '100%' should appear in display zone 2.

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
009	1	Engine torque 2)	During driving 1)	...Nm	- See fault table, fault code 18265 / P1857 => Page 26
(cont.) ▼	2	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 17968 / P1560 => Page 26

1) During driving: A second mechanic is required to read specified values.

2) When driving in one gear the switching torque displayed is constantly high as no engine torque reduction is required.

Note on display zone 1:

The signal for the motor torque is sent to the gearbox control unit by the engine control unit via the CAN-Bus-line.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
009	3	Throttle valve value/accelerator position sender value	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased
			Full throttle	99...100 %	- See fault table, fault code 18269 / P1861 => Page 26 See also display group number 002, display zone 2
	4 2)	Gearbox input torque	During driving 1)	...Nm	Should behave similarly to display zone 1 Can however be disregarded at present

- 1) During driving: A second mechanic is required to read specified values.
- 2) This display zone is only used as of model year 2000 (May 1999).

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
010	1	Torque increase in converter	During driving 1)	0...3.2	Is calculated by the engine control unit from the converter slip speed
	2	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 17968 / P1560 => Page 26
	3	Selected gear	See display group number 001, display zone 4		
	4 2)	Vehicle actual acceleration	During driving 1)	-10 m/s ²	Can be disregarded at present

- 1) During driving: A second mechanic is required to read specified values.
- 2) This display zone is only used as of model year 2000 (May 1999).

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
011	1	Selector lever position	See display group number 004, display zone 2		
	2	Tiptronic recognition switch -F189	Selector lever in Tiptronic gate	M-switch	- Carry out electrical test => Page 136
			Selector lever not in Tiptronic gate	-	
	3	Switch for Tiptronic - F189 (High-/return button)	Select selector lever in Tiptronic gate and gears Upshift 1)		- Carry out electrical test => Page 136
				Upshift switch	



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
			Downshift 2)	Downshift switch	

1) Operate the upshift switch (+) by slightly pressing the selector lever forwards. Vehicles equipped with a Tiptronic sports steering wheel the upshift switch must additionally be operated by slightly touching the upper left or right button (+).

2) Operate the downshift switch (-) by slightly pressing the selector lever backwards. Vehicles equipped with a Tiptronic sports steering wheel the upshift switch must additionally be operated by slightly touching the lower left or right button (-).

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Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
012	1	Type of driving, under load	Drive without load, e.g. driving on a straight road	E	Can be disregarded at present
			Driving under load, e.g. uphill	B	
	2	Dynamic code	Is calculated from drive resistance index and driver evaluation	0...256	
	3	Drive resistance index	Is required for the calculation of dynamic value	0...256	
	4	Driver evaluation	Is required for the calculation of dynamic value	0...256	

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
013 1)	1	CAN bus Standardised torque	With vehicle stationary and ignition switched on	...Nm	Can be ignored at present
	2	CAN bus Engine identification code		0...63	- See fault table, fault code 18157 / P1749 and 18249 / P1841 => Page 26
	3	CAN bus Gearbox identification code		1	- Check coding of the engine control unit
	4	CAN bus Software version code		0...63	- See fault table, fault code 18263 / P1855 => Page 26

1) This display group number is only used as of model year 2000 (May 1999).

Notes on display group number 013:

- ◆ Display zones 2 and 4: If the engine control unit is replaced, then after installing the new control unit the same display should appear as for the old control unit. If this is not the case then an incorrect engine control unit has been installed or it has been incorrectly coded.

Test table for gearbox with hydraulic control E18/2 up to model year 2001

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
125	1	Reception of engine message via CAN bus	During driving 1) Reception	1	- See fault table, fault code 18258 / P1850 => Page 26
			No reception	0 2)	- Carry out electrical test => Page 136
	2	Reception of ABS message via CAN bus	During driving 1) Reception	1	- See fault table, fault code 18259 / P1851 => Page 26
			No reception	0 2)	- Carry out electrical test => Page 136

1) During driving: A second mechanic is required to read specified values.

2) If "0" is displayed and no fault is entered in the fault memory, then the corresponding control unit is not CAN compatible (or is defective).

18.4 - Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001	1	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 17968 / P1560 => Page 26
	2	Gearbox input speed -G182	During driving with selected gear1)	...rpm	- See fault table, fault code 17100 / P0716 => Page 26
(cont.) ▼			R	approx. 0...8200	- Read measured value block, display group numbers 006/007 and determine during driving which elements are defective or not activated
			1, 1m	approx. 0...2000	
			2	approx. 0...8200	
			3	approx. 0...8200	

1) During driving: A second mechanic is required to read specified values.

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001 (cont.) ▼	2		During driving 1) With gear selected 4 5	...rpm	- See previous page
				approx. 0...8200	
				approx. 0...8200	
	3	Gearbox output speed -G195	During driving with selected gear 1) R 1, 1m 2 3 4 5	...rpm	- See fault table, fault code 17105 / P0721 => Page 26 - Read measured value block, display group numbers 006/007 - and check in drive operation which elements are defective or not activated
				approx. 0...2000	
				approx. 0...2000	
				approx. 0...4000	
				approx. 0...5800	
				approx. 0...8200	
				approx. 0...8200	

1) During driving: A second mechanic is required to read specified values.

Notes on display group no. 001, display zone 1 to 3,

- ♦ Test conditions: The switching process must be completed. Vehicle not in overrun operation (no driving downhill or engine brake).

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
001	4	Selected gear	During driving 1) Selector lever position "N" "R" "D"		- Check solenoid valves. See display group numbers 005, 006 and 007 - See fault table, fault code of corresponding solenoid valves => Page 26 - Check selector lever position. Enter display group number 004
				"1"... "5" 2)	
				"R"	
				"1m" "2" "3" "4" "5"	

			"S"	"1m" "2" "3" "4"	
--	--	--	-----	------------------	--

- 1) During driving: A second mechanic is required to read specified values.
- 2) The gearbox control unit is equipped with an automatic gear change. The forward gear is displayed which the gearbox control unit would have actuated during a driving stage change in selector lever position "D".

Notes on display zone 4, display group number 001:

- ◆ Defective solenoid valves or other diagnosed faults may prevent the selection of a certain gear.

Test table for gearbox with hydraulic control E18/2 as of model year 2002

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼	1	Current program	During normal driving 1)		Determined by driving style and road conditions (acceleration, movement of accelerator pedal, speed and load)
			Dynamic shift program is activated	DS	Shifting is avoided as much as possible
			Warming up program is activated	WL	Upshift takes place more quickly to avoid high engine speeds
			Anti-slip control activated	AS	- Check display group number 004
			Tiptronic recognition activated	TT	- See fault table, fault code 18141 / P1733 to 18152 / P1744 => Page 26

- 1) During driving: A second mechanic is required to read specified values.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
002	2	Throttle valve value/accelerator position sender value	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased
			Full throttle	99...100 %	- Carry out electrical testing => as of Page 26
	3	Gearbox output speed -G195	During driving 1)	0...8200	- See fault table, fault code 17105 / P0721 => Page 26 See display group number 001
	4	Selected gear	See display group number 001, display zone 4		

- 1) During driving: A second mechanic is required to read specified values.

Test table for gearbox with hydraulic control E18/2 as of model year 2002



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
003	1	Brake light switch -F	actuated	Brake	- See fault table, fault code 17087 / P0703 => Page 26
			not actuated	-	- Carry out electrical testing => as of Page 136
	2	Solenoid for selector lever lock -N110	Stationary in P, N Brake not operated	P N active	- See fault table, fault code 18170 / P1762 and 18196 / P1761 => Page 26
			Brake actuated	P N not active	- Check solenoid for selector lever lock - N110. Carry out electrical test => Page 136
(cont.) ▼					

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
003	3	Vehicle speed	During driving 1)	...km/h	- If necessary, check sender for speedometer -G22.
	4	Voltage supply term. 15	Stationary min.	10.0 V	- Carry out electrical test => Page 136
			max.	16.0 V	- See fault table, fault code 18158 / P1750 and 18159 / P1751 => Page 26

1) During driving: A second mechanic is required to read specified values.

Note on display zone 3 "vehicle speed":

Display of speedometer and values at VAS 5051/V.A.G 1551 can differ slightly.

Test table for gearbox with hydraulic control E18/2 as of model year 2002

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004 (cont.) ▼	1	ATF temperature	Stationary with engine running.	...°C	- Carry out electrical test => Page 26

Notes on ATF temperature

- ♦ A measured temperature of minus 50°C indicates a short to earth,
- ♦ a measured temperature of 180°C indicates a short to positive or open circuit.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004	2 (cont.) ▼	Selector lever position - (Multi-function switch - F125)	Stationary P	P	- Check multi-function switch -F125. Display group no. 004, display zone 3
			Selector-lever in	R	- Carry out electrical test => Page 136
				N	Check correspondence with display in dash panel insert
				D	- If necessary, adjust selector lever cable
				S	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism; Checking and adjusting selector lever cable

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004 (cont.) ▼	2	Selector lever position - (Multi-function switch -F125) intermediate positions for selector lever mechanism	With vehicle stationary, gear selector lever between	P and R or R and D	- Check multi-function switch -F125. Display group no. 004, display zone 3
				N and D	- Carry out electrical test => Page 136
				D and S	- If necessary, adjust selector lever cable
					=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism; Checking and adjusting selector lever cable

Note for intermediate positions:

If gear selector lever is moved to one of the indicated intermediate positions then "Z1", "Z2" or "Z3" will appear on fault reader. Display on dash panel insert must not display a selected gear, i.e. only PRNDS is displayed, without a gear being illuminated.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004	3	Multi-function switch (drive stage Sender) -F125	Stationary Selector lever position	L1 L2 L3 L4	- See fault table, fault code 17090 / P0706 => Page 26
			P	1000	- Check multi-function switch -F125



(cont.) ▼			R	0100	- Carry out electrical test => Page 136 - If necessary, adjust selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism
			N	1110	
			D	1011	
			S	0111	

Notes on display zone 3, display group number 004:

- ♦ The input signals of the multi-function switch -F125 can be checked at the gearbox control unit.

Line connection to control unit -J217	Display zone 3: (from left to right)			
	L 1	L 2	L 3	L 4
	Contact 36 of -J217	Contact 8 of -J217	Contact 37 of -J217	Contact 9 of -J217

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
004	4	Information in on-board diagnosis: Display reading from left to right	During driving 1)		Can be ignored
		Malfunction display	switched on	1	
			switched off	0	
		Trip	completed	1	
			not completed	0	
		Gearbox warm-up	completed	1	
			not completed	0	
		Engine start	recognised	1	
			not recognised	0	

1) During driving: A second mechanic is required to read specified values.

Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
005	1	Solenoid valve 1 - N88	During driving 1) Selected gear		- Compare display with position of selector elements => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements
			R, N, D (1st, 2nd and 5th gear), D (downshift 5th to 4th gear)	X	

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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
(cont.) ▼			D (3rd and 4th gear)	0	- See fault table, fault codes 17140 / P0756, 17141 / P0757 and 17142 / P0758 => Page 26
	2	Solenoid valve 2 - N89	During driving 1) Selected gear		
			N, D (1st, 2nd and 3rd gear)	X	
			R, D (4th and 5th gear), D (downshift 5th to 4th gear)	0	

1) During driving: A second mechanic is required to read specified values.

Notes on display group no. 005, display zone 1 to 3;

♦ Not switched (inactive) solenoid valves are displayed with "0", switched (active) solenoid valves with "X".

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
005	3	Solenoid valve 3 - N90	During driving 1) Selected gear		- Compare display with position of selector elements
			D (downshift 5th to 4th gear)	X	=> Automatic Gear-box 01V, FWD and 4WD; Repair group 37; Overview of transmission; Position of selector elements
			D (3rd, 4th and 5th gear) 2)	X or 0 2)	
			R, N, D (1st and 2nd gear)	0	- Carry out electrical test => Page 136
	4	Selected gear	See display group number 001, display zone 4		

1) During driving: A second mechanic is required to read specified values.

2) The solenoid valve is actuated briefly during driving, i.e. the state changes from display "0" to "X" and back again to "0". Shifting in these gears is not functionally relevant.

Notes on display group no. 005, display zone 1 to 3;

♦ Not switched (inactive) solenoid valves are displayed with "0", switched (active) solenoid valves with "X".

Test table for gearbox with hydraulic control E18/2 as of model year 2002
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Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
006	1	Nominal current of pressure control valve 1 -N215	During driving 1)		- See fault table, fault code 18222 / P1814 and 18223 / P1815 => Page 26



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				max 2.0 A	
	2	Nominal current of pressure control valve 2 -N216	During driving 1)		- See fault table, fault code 18227 / P1819 and 18228 / P1820 => Page 26
				min 0.0 A	- Carry out electrical test => Page 136
				max 2.0 A	

1) During driving: A second mechanic is required to read specified values.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
006	3	Nominal current of pressure control valve 3 -N217	During driving 1)		- See fault table, fault code 18232 / P1824 and 18233 / P1825 => Page 26
				min 0.0 A	- Carry out electrical test => Page 136
				max 2.0 A	
	4				Can be ignored at present

1) During driving: A second mechanic is required to read specified values.

Notes on nominal value of solenoid valves:

- ♦ Defective solenoid or pressure control valves or clutches or other faults can prevent the selection of a certain gear.

Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
007	1	ATF temperature	See display group number 004, display zone 1		
	2	Nominal current of pressure control valve 4 -N218	During driving 1)	0.0 A	- See fault table, fault code 18237 / P1829 and 18238 / P1830 => Page 26
				max. 2.0 A	
	3	Converter clutch	During driving 1)	TC open	- See fault table, fault code 17125 / P0741 => Page 26
				TC ctrl.	
				TC closed	

1) During driving: A second mechanic is required to read specified values.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
007	4	Converter slip speed	During driving 1) TC open	0.....Fixed brake speed	- Check ATF oil level => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Checking/ changing ATF 26
			TC ctrl. (last switching process at least 20 seconds before)	20...120 rpm	- Determine which element is defective or no longer activated; gearbox with switching elements => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Overview of transmission Overview of transmission
			TC closed	0...20 rpm	- Check comparative plausibility of engine speed, gearbox input speed and gearbox output speed; display group number 001

1) During driving: A second mechanic is required to read specified values.

Note:

- ♦ Test conditions for converter slip speeds => next page

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Test conditions for converter slip speeds:

- ♦ "TC closed": The switching process must be completed (wait at least 1 second), the converter bridging clutch (TC) must be closed and the accelerator value must be constant.
- ♦ "TC ctrl.": The values given are valid for the "controlled condition" of the converter clutch. Under unfavourable conditions (e.g. acceleration uphill) this condition is only reached 20 seconds after the switching process is completed. During this controlling phase slip values of up to 350 rpm may be reached.
- ♦ Converter slip speeds which are too high may also indicate slipping clutches or not activated switching elements.

Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
008	1	Kickdown switch - F8	Kick down actuated 2)	Kickdown	- Check kickdown switch, carry out electrical test => Page 136
			not actuated	-	
	2	Throttle valve value/accelerator position sender value	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased



			Full throttle	99...100 %	- See fault table, fault code 18269 / P1861 => Page 26 See also display group number 002, display zone 2
	3	Overrun/traction signal	During driving 1)	Overrun	When driving downhill or delay (engine brake)
			Traction operation	-	During normal driving, engine provides power

1) During driving: A second mechanic is required to read specified values.

2) 'Activate kickdown' means that you need to press the accelerator pedal down as far as it will go. At the same time, '100%' should appear in display zone 2.

Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
009	1	Engine torque 2)	During driving 1)	...Nm	- See fault table, fault code 18265 / P1857 => Page 26
(cont.) ▼	2	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 17968 / P1560 => Page 26

1) During driving: A second mechanic is required to read specified values.

2) When driving in one gear the switching torque displayed is constantly high as no engine torque reduction is required.

Note on display zone 1:

The signal for the motor torque is sent to the gearbox control unit by the engine control unit via the CAN-Bus-line.

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
009	3	Throttle valve value/accelerator position sender value	Stationary Idling	0...1 %	When accelerating from idling to full throttle the % value is continually increased
			Full throttle	99...100 %	- See fault table, fault code 18269 / P1861 => Page 26 See also display group number 002, display zone 2

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	4 2)	Gearbox input torque	During driving 1)	...Nm	Should behave similarly to display zone 1 Can however be disregarded at present
--	------	----------------------	-------------------	-------	--

- 1) During driving: A second mechanic is required to read specified values.
- 2) This display zone is only used as of model year 2000 (May 1999).

Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
010	1	Torque increase in converter	During driving 1)	0...3.2	Is calculated by the engine control unit from the converter slip speed
	2	Engine speed	With engine running	approx. 0...8200 rpm	- See fault table, fault code 17968 / P1560 => Page 26
	3	Selected gear	See display group number 001, display zone 4		
	4 2)	Vehicle actual acceleration	During driving 1)	-10 m/s ²	Can be disregarded at present

- 1) During driving: A second mechanic is required to read specified values.
- 2) This display zone is only used as of model year 2000 (May 1999).

Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
011	1	Selector lever position	See display group number 004, display zone 2		
	2	Tiptronic recognition switch -F189	Selector lever in Tiptronic gate	M-switch	- Carry out electrical test => Page 136
			Selector lever not in Tiptronic gate	-	
	3	Switch for Tiptronic - F189 (High-/return button)	Select selector lever in Tiptronic gate and gears Upshift 1) Downshift 2)	Upshift switch	- Carry out electrical test => Page 136
				Downshift switch	

- 1) Operate the upshift switch (+) by slightly pressing the selector lever forwards. Vehicles equipped with a Tiptronic sports steering wheel the upshift switch must additionally be operated by slightly touching the upper left or right button (+).
- 2) Operate the downshift switch (-) by slightly pressing the selector lever backwards. Vehicles equipped with a Tiptronic sports steering wheel the upshift switch must additionally be operated by slightly touching the lower left or right button (-).

Test table for gearbox with hydraulic control E18/2 as of model year 2002



Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
012	1	Type of driving, under load	Drive without load, e.g. driving on a straight road	E	Can be disregarded at present
			Driving under load, e.g. uphill	B	
	2	Dynamic code	Is calculated from drive resistance index and driver evaluation	0...256	
	3	Drive resistance index	Is required for the calculation of dynamic value	0...256	
	4	Driver evaluation	Is required for the calculation of dynamic value	0...256	

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Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
013	1	CAN bus Standardised torque	With vehicle stationary and ignition switched on	...Nm	Can be ignored at present
	2	CAN bus Engine identification code		0...63	- See fault table, fault code 18157 / P1749 and 18249 / P1841 => Page 26
	3	CAN bus Gearbox identification code		1	- Check coding of the engine control unit
	4	CAN bus Software version code		0...63	- See fault table, fault code 18263 / P1855 => Page 26

Notes on display group number 013:

- ♦ Display zones 2 and 4: If the engine control unit is replaced, then after installing the new control unit the same display should appear as for the old control unit. If this is not the case then an incorrect engine control unit has been installed or it has been incorrectly coded.

Test table for gearbox with hydraulic control E18/2 as of model year 2002

Display group no.	Display zone	Designation	Test conditions	Display on VAS 5051 specified value	Action in the event of deviation from specified value
125	1	Reception of engine message via CAN bus	During driving 1) Reception	1	- See fault table, fault code 18258 / P1850 => Page 26
			No reception	0 2)	- Carry out electrical test => Page 136

	2	Reception of ABS message via CAN bus	During driving 1) Reception	1	- See fault table, fault code 18259 / P1851 => Page 26
			No reception	0 2)	- Carry out electrical test => Page 136

1) During driving: A second mechanic is required to read specified values.

2) If "0" is displayed and no fault is entered in the fault memory, then the corresponding control unit is not CAN compatible (or is defective).

19 - Function of CAN-Bus

19.1 - Function of CAN-Bus

19.2 - Checking data exchange between gearbox control unit and other CAN-capable control units

Notes:

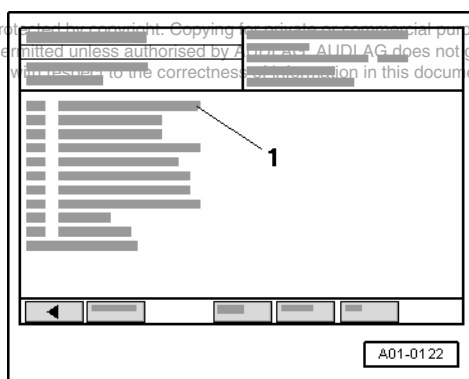
- ◆ Data is exchanged between individual control units by means of a bus system.
- ◆ "CAN bus" is used to describe a system that transports and distributes data.
- ◆ The wires between the control units that are used to transfer the data are known as signal wires.
- ◆ Data is transmitted via data wires in sequence, i.e. in a specific order to the connected control units (e.g. engine rpm, accelerator pedal position).

Checking the bus system

The fault table instructed you to check the data exchange between the gearbox control unit and CAN-capable control units.

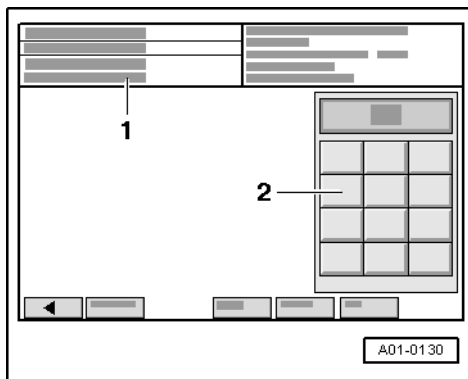
- Connect the vehicle diagnostic, testing and information system VAS 5051 => Page **21** and select vehicle system "02 - Gearbox electronics". For this purpose, the ignition must be switched on.

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-> Display on VAS 5051:

- Under -1- select diagnostic function "08 - Read measured value block".



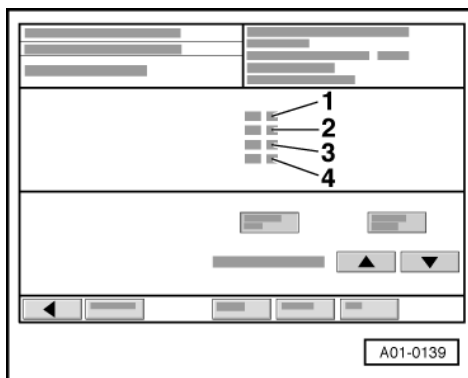
-> Display on VAS 5051:

- 1 - Enter display group

Note:

The measured value block 125 indicates drive data bus users.

- Enter "125" for "display group number 125" in zone -2- and confirm the entry by pressing the Q key.



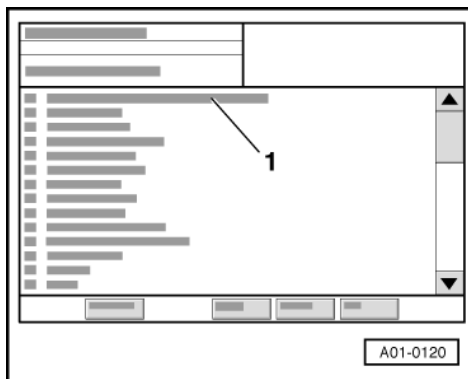
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-> Display on VAS 5051:

- Check readout in display zones -1- to -3-.

CAN-capable control units are displayed with the engine control unit:

- Display 1: CAN-capable control unit is a data bus user
- Display 0 or no display: CAN-capable control unit is not user of data bus or not CAN-capable
- End function "08 - Read measured value block" by pressing the ◀ key.
- Press "06 - End output".



-> Display on VAS 5051:

- Under -1- select diagnostic function "00 - Interrogate fault memory - Total system".
 - The fault memory is then interrogated for all systems in the vehicle which are capable of self-diagnosis

If a control unit answers with its identification, the number of faults stored or "No fault detected" appears on the display.

Any system faults that are stored are displayed one after the other. The VAS 5051 will then transmit the next address word.

If a fault is displayed relating to "Drive data bus" or "...CAN bus":

- Check that engine control unit and other CAN-capable control units installed are suitable for this vehicle (part no. and code).

If the correct control units are installed:

- Check that multiple connectors for control units are properly seated.

If the multi-pin connectors are firmly seated:

- Check the CAN bus system.

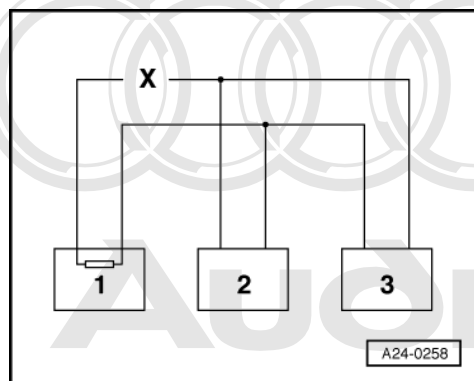
Checking a "two-wire bus system"

The communication between three or more control units is carried out over a "two-line bus system".

- Evaluate the faults stored in the control units.

Note:

This helps to localise wiring faults.



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Example 1:

The faults stored in the fault memories indicate that the control unit 1 does not communicate with control units 2 and 3.

Control unit	Faults stored in fault memory
1	- No message from control unit 2 - No message from control unit 3
2	- No message from control unit 1
3	- No message from control unit 1

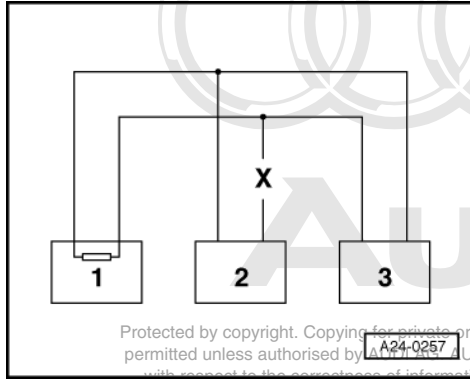
- Switch ignition off.



- Disconnect the control units linked to one another via the bus wires and investigate whether there is an open circuit between the bus wires.

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

- If no fault can be detected in the bus wires exchange control unit 1.



Example 2:

The faults stored in the fault memories indicate that the control unit 2 does not communicate with control units 1 and 3.

Control unit	Faults stored in fault memory
1	- No message from control unit 2
2	- No message from control unit 1 - No message from control unit 3
3	- No message from control unit 2

- Switch ignition off.
- Disconnect the control units linked to one another via the bus wires and investigate whether there is an open circuit between the bus wires.

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

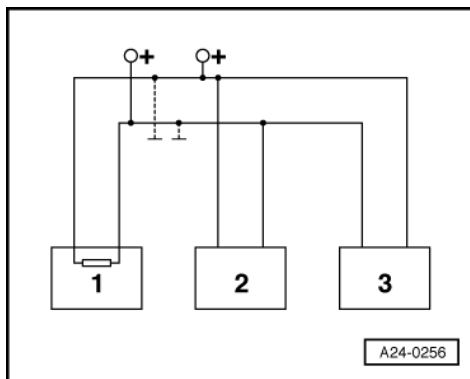
- If no fault can be detected in the bus wires exchange control unit 2.

Example 3:

The faults stored in the fault memories indicate that sending or receiving is not possible in any of the control units.

Control unit	Faults stored in fault memory
1	- Drive data bus defective
2	- Drive data bus defective
3	- Drive data bus defective

- Switch ignition off.



- -> Disconnect the control units that are linked to one another by the bus wires and check the bus wires for short circuits to positive and earth.

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

If cause of fault "Drive data bus defective" cannot be found in bus wires check whether one of the control units is responsible for the fault.

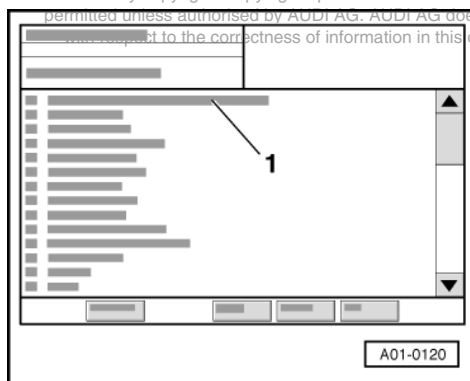
Test requirements:

- Vehicle diagnostic, testing and information system VAS 5051 connected and vehicle self-diagnosis selected
=> Page 21.

All the control units that communicate via the CAN data bus are still disconnected. Ignition is switched off.

- Connect one of the control units.

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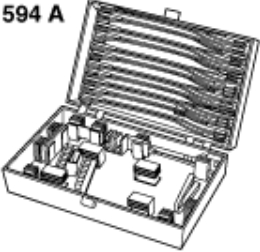
-> Display on VAS 5051:

- Switch the ignition on.
- Select the applicable vehicle system under -1-.
- Interrogate and erase fault memory in the control unit which has just been connected.
- Press the ◀ key.
- Under -1- select diagnostic function "06 - End output".
- Switch the ignition off and then on again.
- Leave the ignition switched on for 10 seconds. Then interrogate the fault memory of the control unit that has just been connected, using the fault reader.
- If the fault "Drive data bus defective" is now indicated, replace the control unit which has just been connected.
- If fault "Signal wire defect" is not read out, connect the next control unit and repeat the procedure.



20 - Electrical check

20.1 - Electrical check

V.A.G 1526 A 	V.A.G 1598/20  <small>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.</small>
V.A.G 1594 A 	
	G01-0003

The following special tools and testing devices are required:

- ♦ Hand-held multimeter V.A.G 1526 A or vehicle diagnostic, testing and information system VAS 5051 with test leads VAS 5051/7
- ♦ V.A.G 1598/20 test box
- ♦ V.A.G 1594 A Adapter set

Additionally required information

- ♦ Workshop Manual Audi A8 1994 ä, Automatic Gearbox 01V
- ♦ "Current Flow Diagrams, Electrical Fault-finding and Fitting Locations" binder

Notes:

- ♦ Testing is to be performed using the hand-held multimeter V.A.G 1526A. The tables list the types of measurement to be set prior to taking the corresponding measurement.
- ♦ The specified values given are valid for an ambient temperature of 0 °C to 40 °C.
- ♦ If the measured values deviate from the specified values find fault according to current flow diagram.

- ♦ If the measured values deviate only slightly from the specified values clean sockets and connectors of the control units and test lines and repeat test. Before replacing the corresponding components their lines and connectors must be tested. Especially with specified values under 10 ω the resistance measurement at the component should be repeated.
- ♦ To connect test devices use test box V.A.G 1598/20.
- ♦ The contact numbers of the connectors and socket numbers of the test box V.A.G 1598/20 match => Page 137 .
- ♦ To test multi-function switch, test box V.A.G 1598/20 must not be connected, as the connector on multi-function switch is tested first => Page 152

Important

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

Test requirements

- Battery voltage OK.
- Fuses for the gearbox control unit OK

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

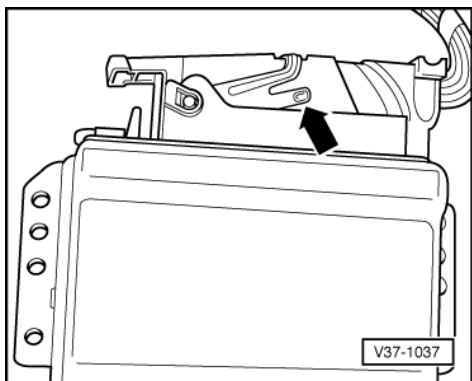
- Fuses of the component to be tested OK.

Fuse carrier is located behind a cover at end of dash panel insert.

- Earth connections OK.

Check battery earth cable and earth cable between body and gearbox.
Check earth connections for gearbox control unit.

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



- -> For all tests ignition must be switched off, unplug multi-pin connector (connector plug) from control unit for automatic gearbox -J217 (control unit is at the front right in the plenum chamber in the electronics box => Page 3) and the test box V.A.G 1598/20 must be connected to the wiring harness connector.
- If the measured values deviate from the nominal values carry out measures for the deviation from nominal value in the right part of the test table=>Page 140 .
- Carry out all measures listed in the column "Measures for deviation from specified value".
- Only carry out test steps recommended in the fault table (targeted approach).

Multi-pin connector (connector plug 88-pin) of control unit -J217 (sockets on V.A.G 1598/20)

1- Solenoid valve 5 -N92 (pressure control valve 2 - N216) 5)	18- Kickdown switch -F8 (not with electronic throttle and V6 TDI)
2- Solenoid for selector lever lock -N110	19- Control input to gearbox from ABS control unit
3- Not used	20- Torque reduction (via ignition timing) 1)



4- Solenoid valve 7 -N94 (pressure control valve 4 - N218) 5)	21- Sender for gearbox oil temperature -G93 (ATF)
5- Solenoid valve 4 -N91 (pressure control valve 1 - N215) 5)	22- Sender for gearbox oil temperature -G93 (ATF)
6- Earth for power converter (Terminal 31)	23- Sender for gearbox input speed -G182 (screening)
7- Not used	24- Not used
8- Multi-function switch -F125 L2	25- Selector lever position display (not with Highline dash panel insert)
9- Multi-function switch -F125 L4; Supply voltage for speed control system	26- Supply voltage (terminal 30), with or without fuse depending on version => Current flow diagram
10- Brake light switch-F (not with electronic throttle and V6 TDI)	27- Kickdown for air conditioner 1)
11- Not used	28- Earth for electronics (terminal 31) 4)
12- Not used	29- Solenoid valve 6 -N93 (pressure control valve 3 - N217) 5)
13- Tiptronic recognition	30- Solenoid valve 1 -N88
14- Gearbox speed sender -G38 (-G195) 6)	31- Not used
15- Gearbox speed sender -G38 (screening) (-G195) 6)	32- Solenoid valve 3 -N90
16- Sender for gearbox input speed -G182	33- Solenoid valve 2 -N89
17- Signal for malfunction monitor (OBD II - requirement) 1) 2)	34- Earth for power converter (Terminal 31)

Notes and footnotes on contact assignment of multi-pin connector => Page 139

35- Fuel consumption signal (current engine torque) 1)	54- Supply voltage (Terminal 15)
36- Multi-function switch - F125 L1	55- Supply voltage (Terminal 15)
37- Multi-function switch - F125 L3	56- Not used
38- Not used	-
39- Not used	-
40- Engine speed signal1	-
41- Throttle valve value (load signal) 1)	-
42- Gearbox speed sender -G38 (-G195) 6)	-
43- Not used	-
44- Sender for gearbox input speed -G182	- Sockets 57 to 83 are not used
45- Not used	-
46- Tiptronic upshift	-
47- Tiptronic downshift	-
48- Not used	-
49- Not used	84- Not used
50- Not used	85- CAN-Bus3)
51- Upshift/downshift signal (for torque reduction) 1)	86- CAN-Bus3)
52- Supply voltage for solenoid valves	87- Not used

53- Supply voltage for solenoid valves	88- K-wires of diagnosis
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Notes and footnotes on contact assignment of multi-pin connector => Page 139

Notes and footnotes on contact assignment of multi-pin connector

1) Only for vehicles with no CAN bus.

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

2) Signal is transmitted via engine control unit to gearbox control unit and can only be checked in measured value block => Page 85.

3) Only for vehicles with CAN bus. Further information on CAN bus => Page 131

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

4) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

5) Solenoid valves 4 to 7 (-N91 to -N94) are also referred to as pressure control valves 1 to 4 (-N215 to -N218).

6) Gearbox speed sender -G38 is also referred to as gearbox output speed sender -G195.

List of test steps (88-pin multiple connector)

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

Component tested		Component tested	
Supply voltage from control unit -J217	- Carry out test step 1 and 7	Solenoid valve 5 -N92 (pressure control valve 2 - N216)	- Carry out test step 13 and 8
Solenoid for selector lever lock -N110	- Carry out test step 2, 6 and 16	Solenoid valve 6 -N93 (pressure control valve 3 - N217)	- Carry out test step 14 and 8
Brake light switch -F	- Perform test step 3	Solenoid valve 7 -N94 (pressure control valve 4 - N218)	- Carry out test step 15 and 8
Supply voltage for cruise control system 3)	- Perform test step 4	Gearbox speed sender - G38 (gearbox output speed sender -G195)	- Perform test step 18
Kickdown switch -F8 (not for V6 TDI and electronic throttle)	- Carry out test step 5 and 17	Sender for gearbox input speed -G182	- Perform test step 19
Check multi-function switch (drive stage sender) -F125	- Page => 152	Sender for gearbox oil temperature -G93 (ATF)	- Perform test step 20
Solenoid valve 1 -N88	- Carry out test step 8 and 9	Wiring to engine control unit 1)	- Carry out test step 21, 22, 23, 24 and 25
Solenoid valve 2 -N89	- Carry out test step 10 and 8	Switch for Tiptronic -F189	- Carry out test step 26 and 27
Solenoid valve 3 -N90	- Carry out test step 11 and 8	CAN-Bus2)	- Carry out test step 28 and check bus system => Page 131



Solenoid valve 4 -N91 (pressure control valve 1 - N215)	- Carry out test step 12 and 8		
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1) Signal is transmitted via engine control unit to gearbox control unit; Checking only for vehicles with no CAN bus

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

2) Checking only for vehicles with CAN bus.

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

3) Only for vehicles with 8-pin connector for multi-function switch -F125

20.2 - Test table

Switch on measuring range: voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
1	55 + 34 55 + 6 54 + 28 1)	Supply voltage from control unit - J217 <small>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</small>	▪ Ignition switched on	approx. battery voltage	- Check wiring according to current flow diagram Check wiring to earth from terminal 6, 34 and 28 respectively Check wiring from contact 54 and 55 to terminal 15 central electrics
	54 + 55			0 V	
	26 + 6 26 + 34	Vehicle voltage term. 30 from control unit -J217	▪ Ignition switched off	approx. battery voltage	- Check wiring according to current flow diagram

1) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

Switch on measuring range: voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

2	2 + 6	Selector lever lock solenoid -N110 1)	▪ Ignition switched on	approx. battery voltage	- Perform final control diagnosis (functional test) => Page 70 Check wiring according to current flow diagram Check multi-function switch -F125 for short circuit Check solenoid -N110 for short circuit Carry out test step 6 and 16
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1) Selector lever lock solenoid -N110 is also referred to as "Selector lever lock => solenoid -N110".

Switch on measuring range: voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
3 1) Not for V6 TDI engines and electronic throttle	10 + 6 10 + 28 2)	Brake light switch -F	▪ Ignition switched on ▪ Brake pedal not pressed	Less than 1 V	- Check wiring according to current flow diagram Replace and adjust brake light switch -F
			- Brake pedal pressed	approx. battery voltage	=> FWD and 4WD Running Gear; Repair group 47; Exploded view: Pedal cluster, brake pedal

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1) This test cannot be performed on 6-cyl. TDI engines and vehicles with electronic throttle. Signal is transmitted from brake light/brake test switch to engine control unit, which in turn relays it via CAN bus to gearbox control unit. This in turn sends the signal via the CAN bus to the gearbox control unit.

2) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

Switch on measuring range: voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
4 1)	9 + 6	Supply voltage for speed control system -J213	▪ Ignition switched on ▪ Selector lever in "D", "4", "3"	approx. battery voltage	- Check wiring to earth from terminal 6 and 28 respectively Check wiring from contact 9 to terminal 15 central electrics



			<ul style="list-style-type: none"> ▪ Selector lever in "P", "R", "N", "2" 	Less than 5 V	<ul style="list-style-type: none"> - Check wiring to control unit of cruise control system -J213 Check multi-function switch - F125 => Page 152 Check fuse 31
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1) Only for vehicles with 8-pin connector for multi-function switch -F125

Switch on measuring range: voltage measurement					
Test step	V.A.G 1598/20	Testing of	<ul style="list-style-type: none"> ▪ Test conditions - Additional operations 	Specified value	Action in the event of deviation from specified value
5 1)	18 + 54	Kickdown switch -F8	<ul style="list-style-type: none"> ▪ Ignition switched on Depress accelerator pedal to kickdown 	approx. battery voltage	<ul style="list-style-type: none"> - Check wiring according to current flow diagram Perform test step 17 Adjust or replace accelerator cable => Fuel Supply - Petrol Engines; Repair group 20

1) Only for vehicles fitted with kickdown switch. Fitting location of kickdown switch => Fig. 19

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	<ul style="list-style-type: none"> ▪ Test conditions - Additional operations 	Specified value	Action in the event of deviation from specified value
6	2 + 54 2 + 55	Selector lever lock solenoid -N110 1)	<ul style="list-style-type: none"> - Selector lever in "P" ▪ Ignition switched off 	14 to 28 ω	<ul style="list-style-type: none"> - Perform final control diagnosis (functional test) => Page 152 Check solenoid - N110 for short circuit Carry out test step 2 and 16 Replace selector lever lock solenoid - N110 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism

1) Selector lever lock solenoid -N110 is also referred to as "Selector lever lock => solenoid -N110".

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	<ul style="list-style-type: none"> ▪ Test conditions - Additional operations 	Specified value	Action in the event of deviation from specified value
7	6 + 341) 28 + 34	Earth connections of control unit -J217	<ul style="list-style-type: none"> ▪ Ignition switched off 	Less than 1 ω	<ul style="list-style-type: none"> - Check wiring according to current flow diagram.

	34 + earth to battery			Less than 1 ω	
8	52 + 53	Supply lines of solenoid valves	▪ Ignition switched off	Less than 1.5 ω	- Check wiring according to current flow diagram Check control unit wiring to 16-pin connector => Page 150 Perform test step 1 Use current flow diagram to check wiring harness in gearbox

1) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
9	52 + 30	Solenoid valve 1 - N88	▪ Ignition switched off	25 to 35 ω	- Check 16-pin connector to gearbox for contact corrosion - Perform test step 8
	30 + 34			Infinite ω 1)	
10	52 + 33	Solenoid valve 2 - N89	▪ Ignition switched off	25 to 35 ω	- Check wiring between 88-pin control unit and 8-pin connector => Page 150 - Use current flow diagram to check wiring harness in gearbox and replace if necessary
	33 + 34			Infinite ω 1)	
11	52 + 32	Solenoid valve 3 - N90	▪ Ignition switched off	25 to 35 ω	- Removing and installing valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body
	32 + 34			Infinite ω 1)	
12	52 + 5	Solenoid valve 4 - N912)	▪ Ignition switched off	6 to 8 ω	
	5 + 34			Infinite ω 1)	

1) Infinite ω equates to open circuit.

2) Solenoid valve 4 -N91 is also referred to as pressure control valve 1 -N215.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
13	52 + 1	Solenoid valve 5 - N92 2)	▪ Ignition switched off	6 to 8 ω	- Check 16-pin connector to gearbox for contact corrosion - Perform test step 8
	1 + 34			Infinite ω 1)	



14	52 + 29	Solenoid valve 6 - N93 3)	▪ Ignition switched off	6 to 8 ω	- Check wiring between 88-pin control unit and 8-pin connector => Page 150 - Use current flow diagram to check wiring harness in gearbox and replace if necessary
	29 + 34			Infinite ω 1)	
15	52 + 4	Solenoid valve 7 - N94 4)	▪ Ignition switched off	6 to 8 ω	- Removing and installing valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body
	4 + 34			Infinite ω 1)	

- 1) Infinite ω equates to open circuit.
- 2) Solenoid valve 5 -N92 is also referred to as pressure control valve 2 -N216.
- 3) Solenoid valve 6 -N93 is also referred to as pressure control valve 3 -N217.
- 4) Solenoid valve 7 -N94 is also referred to as pressure control valve 4 -N218.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
16	2 + 36	Selector lever lock solenoid -N110 1)	▪ Ignition switched off Selector lever in "P"	14 to 28 ω	- Perform final control diagnosis (functional test) => Page 152 Carry out test step 2 and 6 Replace selector lever lock solenoid - N110 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism

- 3) Selector lever lock solenoid -N110 is also referred to as "Selector lever lock => solenoid -N110".

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
17 2)	18 + 34	Kickdown switch -F8	▪ Ignition switched off ▪ Accelerator pedal not pressed down	Infinite ω 1)	- Check wiring according to current flow diagram Perform test step 5 - Adjust or replace accelerator cable

			- Depress accelerator pedal to kickdown	Less than 1.5 ω	=> Fuel Supply - Petrol Engines; Repair group 20 => Fuel Supply - Diesel Engines; Repair group 20
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- 1) Infinite ω equates to open circuit, i.e. switch is open.
- 2) Only for vehicles fitted with kickdown switch. Fitting location of kickdown switch => Fig. 19

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
18	14 + 42	Gearbox speed sender -G382)	▪ Ignition switched off min. _____ max.	0.8 K ω	- Check wiring according to current flow diagram - Replace gearbox speed sender -G38 =>Page 18, Fig. 10
	14 + 34 14 + 54 42 + 54 42 + 34			1.2 K ω	
				Infinite ω 1)	
	15 + 34 15 + 54	Screen for -G38	▪ Ignition switched off	Infinite ω 1)	- Check wiring according to current flow diagram.

- 1) Infinite ω equates to open circuit.
- 2) Gearbox speed sender -G38 is also referred to as gearbox output speed sender -G195.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
19 Only for hydraulic control E17 2)	16 + 44	Sender for gearbox input speed -G182	▪ Ignition switched off min. _____ max.	0.23 K ω	- Check wiring according to current flow diagram - Replace gearbox input speed sender -G182 =>Page 17, Fig. 11
	44 + 34 44 + 54 16 + 54 16 + 34			0.30 K ω	
				Infinite ω 1)	
	23 + 34 23 + 54	Screen for -G182	▪ Ignition switched off	Infinite ω 1)	- Check wiring according to current flow diagram

- 1) Infinite ω equates to open circuit.
- 2) This test step can only be performed on gearboxes with hydraulic control E17. Information on the gearbox concerned can be found in the following Workshop Manual under the Repair group quoted:
=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

**Note on test step 19:**

On gearbox with hydraulic control E18/2, this sender is not an inductive sender, but a Hall sender, Fitting location=>Fig. 17. Resistance cannot be measured at a Hall sender.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
20	21 + 22	Gearbox oil temperature sender - G93 (ATF)	▪ Ignition switched off ▪ ATF temperature approx. 20 °C approx. 60 °C approx. 120 °C		- Check wiring between 88-pin control unit and 8-pin connector => Page 150 - Check wiring harness in gearbox and replace, if necessary - G93 is integrated in the wiring harness (in gearbox) - Removing and installing valve body => Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body
	21 + 34 22 + 28 3)			approx. 0.83 Kw2) approx. 1.28 Kw2) approx. 1.88 Kw2)	
	21 + 54 22 + 54			Infinite ω1) Infinite ω1)	

- 1) Infinite ω equates to open circuit.
- 2) Permissible tolerance: ± 0.1 kw
- 3) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
21 A)	41 + 28 3) 41 + 34 41 + 55 41 + 26	Wiring to engine control unit (throttle valve signal)	▪ Ignition switched off ▪ Engine control unit disconnected	Infinite ω1)	- Check wiring according to current flow diagram
	41 + xx2)			Less than 1.5 ω	

- 1) Infinite ω equates to open circuit.
- 2) Corresponding terminal connection at engine control unit.

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

A) Signal is transmitted via engine control unit to gearbox control unit; Checking only for vehicles with no CAN bus

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

3) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
22 A)	35 + 28 1) 35 + 34 35 + 55 35 + 26	Wiring to engine control unit (consumption signal/load signal)	▪ Ignition switched off ▪ Engine control unit disconnected	Greater than 40 Ω	- Check wiring according to current flow diagram Unplug connectors to components (which also receive this signal) and repeat measurement
	35 + xx2)			Less than 1.5 Ω	- If necessary, check these components for short circuit (e.g. on-board computer)
	35 + 34 35 + 28 1)		▪ Ignition switched on ▪ Engine control unit disconnected	≥ 5 V	=> Electrical System; Repair group 01; Dash panel insert self-diagnosis

1) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

2) Corresponding terminal connection at engine control unit.

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

A) Signal is transmitted via engine control unit to gearbox control unit; Checking only for vehicles with no CAN bus

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
23 A)	40 + 28 3) 40 + 34	Wiring to engine control unit (engine speed signal)	▪ Ignition switched off ▪ Engine control unit disconnected	15...80 K Ω	- Check wiring according to current flow diagram Check on-board computer
	40 + xx2)			Less than 1.5 Ω	=> Electrical System; Repair group 01; Dash panel insert self-diagnosis



24 A)	20 + 28 3) 20 + 34 20 + 55 20 + 26	Wiring to engine control unit (torque reduction)	<ul style="list-style-type: none"> ▪ Ignition switched off ▪ Engine control unit disconnected 	Infinite ω 1)	- Check wiring according to current flow diagram
	20 + xx2)			Less than 1.5 ω	

1) Infinite ω equates to open circuit.

2) Corresponding terminal connection at engine control unit.

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

A) Signal is transmitted via engine control unit to gearbox control unit; Checking only for vehicles with no CAN bus

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

3) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
25 A)	51 + 28 3) 51 + 34 51 + 55 51 + 26	Wiring to engine control unit (up-shift/downshift signal)	<ul style="list-style-type: none"> ▪ Ignition switched off ▪ Engine control unit disconnected 	Infinite ω 1)	- Check wiring according to current flow diagram
	51 + xx2)			Less than 1.5 ω	

1) Infinite ω equates to open circuit.

2) Corresponding terminal connection at engine control unit.

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

A) Signal is transmitted via engine control unit to gearbox control unit; Checking only for vehicles with no CAN bus

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

3) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

Switch on measuring range: Resistance measurement 2 M ω)					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
26	13 + 34 13 + 28	Tiptronic switch -F189 (Tiptronic recognition)	<ul style="list-style-type: none"> ▪ Ignition switched off Selector lever not in Tiptronic gate 	Infinite ω 1)	- Check wiring according to current flow diagram Carry out test step 27

			<ul style="list-style-type: none"> ▪ Ignition switched off Selector lever in Tiptronic gate 	less than 10 ω	<ul style="list-style-type: none"> - Replace switching operation, if necessary replace Tiptronic switch -F189 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism Servicing shift mechanism
--	--	--	---	-----------------------	--

1) Infinite ω equates to open circuit, i.e. switch is open.

Switch on measuring range: Voltage measurement 20 V					
Test step	V.A.G 1598/20	Testing of	<ul style="list-style-type: none"> ▪ Test conditions - Additional operations 	Specified value	Action in the event of deviation from specified value
27	46 + 54 46 + 55	Tiptronic up-shift and down-shift switch -F189	<ul style="list-style-type: none"> ▪ Ignition switched on Selector lever in Tiptronic gate 	Less than 1 V	Driver can use shift-up/shift-down switch to manually engage required gear
			<ul style="list-style-type: none"> ▪ Ignition switched on Shift-up actuated 	approx. battery voltage	<ul style="list-style-type: none"> - Check wiring according to current flow diagram 1) Carry out test step 26
	47 + 54 47 + 55		<ul style="list-style-type: none"> ▪ Ignition switched on Selector lever in Tiptronic gate 	Less than 1 V	<ul style="list-style-type: none"> - Replace switching operation, if necessary replace Tiptronic switch -F189 => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism
			<ul style="list-style-type: none"> ▪ Ignition switched on Shift-down actuated 	approx. battery voltage	

1) On vehicles with Tiptronic steering wheel, also check wiring to steering wheel.

Notes on test step 27:

When selector lever is in Tiptronic gate, it is possible to shift down manually by moving lever back (-), or - on vehicles with Tiptronic sports steering wheel - by pressing one of the minus (-) buttons on the steering wheel (shift-down switch). Moving lever forwards (+) or - on vehicles with Tiptronic sports steering wheel - pressing one of the positive (+) buttons on the steering wheel effect manual upshift (upshift switch).

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	<ul style="list-style-type: none"> ▪ Test conditions - Additional operations 	Specified value	Action in the event of deviation from specified value
28 A)	85 + 28 3) 85 + 34 86 + 28 3) 86 + 34	Wiring connection from gearbox to engine control unit (CAN-Bus)	<ul style="list-style-type: none"> ▪ Ignition switched off ▪ Engine control unit disconnected 	Infinite ω 1)	<ul style="list-style-type: none"> - Check wiring according to current flow diagram



	85 + xx2) 86 + xx2)			Less than 1.5 ω	Further description of CAN-Bus-line => Page 131
--	------------------------	--	--	-----------------	---

1) Infinite ω equates to open circuit.

2) Corresponding terminal connection at engine control unit.

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

A) Checking only for vehicles with CAN bus.

=> Automatic Gearbox 01V, FWD and 4WD; Repair group 00; Code letters, gearbox allocation, ratios, equipment Code letters, gearbox allocation, ratios, equipment

3) Pin 28 on control unit is not used on vehicles with 10-pin connector for multi-function switch -F125.

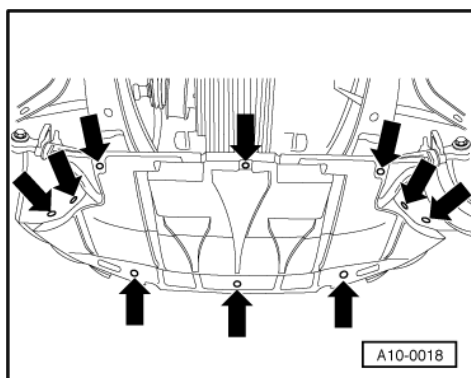
20.3 - Checking wiring connection between 88-pin gearbox control unit and gearbox.

Carry out when:

- ♦ The final control diagnosis or
- ♦ The electrical test indicates a fault in or between gearbox and gearbox control unit -J217.

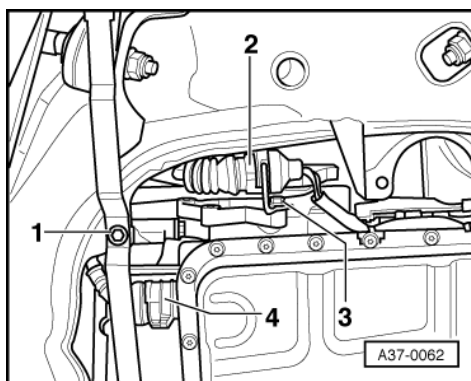
Test requirements

- ♦ Ignition switched off
- ♦ Only connect test box V.A.G 1598/20 to 88-pin connector of gearbox wiring harness.



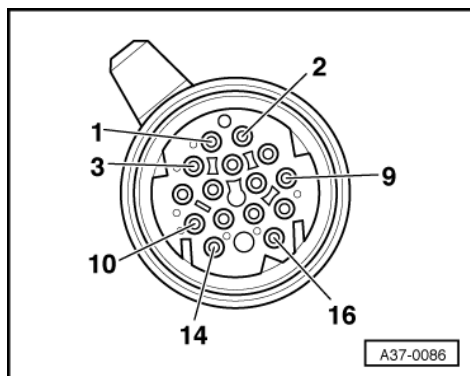
- ♦ Take measurements with test box V.A.G 1598/20 outside vehicle

- -> Remove noise insulation.
- Remove holder-1- for noise insulation.



Check wiring connection to 16-pin connector at gearbox

- -> Detach bayonet lock -4- of 16-pin connector from gearbox by twisting.



- -> Check wiring connection between terminals of 16-pin connector and sockets of test box V.A.G 1598/20 for continuity with hand-held multimeter V.A.G 1526A or V.A.G 1715. For resistances see following table.

Plug terminal	Test box V.A.G 1598/20, socket	Specified value	Action in the event of deviation from specified value
1	42	$\leq 1.5 \, \Omega$	- Remedy open circuit according to current flow diagram Check connector for: - Contact corrosion - Water damage - Leakage
2	5	$\leq 1.5 \, \Omega$	
3	1	$\leq 1.5 \, \Omega$	
4	32	$\leq 1.5 \, \Omega$	
5	16	$\leq 1.5 \, \Omega$	
6	44	$\leq 1.5 \, \Omega$	
7	29	$\leq 1.5 \, \Omega$	
8	30	$\leq 1.5 \, \Omega$	
9	33	$\leq 1.5 \, \Omega$	
10	14	$\leq 1.5 \, \Omega$	
11	4	$\leq 1.5 \, \Omega$	
12	52	$\leq 1.5 \, \Omega$	
13	22	$\leq 1.5 \, \Omega$	

Plug terminal	Test box V.A.G 1598/20, socket	Specified value	Action in the event of deviation from specified value
14	21	$\leq 1.5 \, \Omega$	- Remedy open circuit according to current flow diagram - Check connector
15	-		
Contact not used			
16	53	$\leq 1.5 \, \Omega$	

Notes:

- ♦ If this test of the wiring connection did not show any impermissible deviations the wiring harness at the gearbox must be checked

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=> Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body Removing and installing valve body

- ♦ Only after a satisfactory test of the wiring harness in the gearbox can the appropriate solenoid valves be replaced.



=> Automatic Gearbox 01V, FWD and 4WD; Repair group 38; Removing and installing valve body
Removing and installing valve body

20.4 - Checking multi-function switch (drive stage sender) -F125

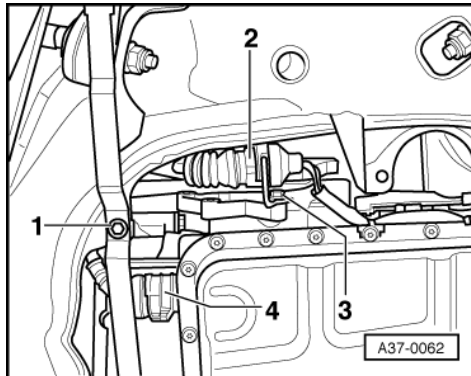
Notes:

- ♦ Test measured value block for multi-function switch first, before carrying out electrical test of multi-function switch => Page **85** , Display group number 004
- ♦ Ensure that selector lever cable is correctly adjusted.

Two versions of multi-function switch are fitted:

1. Multi-function switch with 8-pin connector => Testing page **152** onwards
2. Multi-function switch with 10-pin connector => Testing page **158** onwards

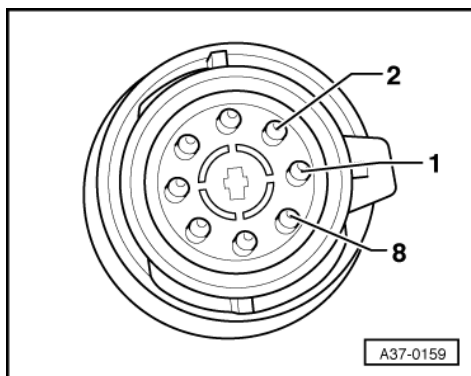
20.5 - Test for multi-function switch with 8-pin connector



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1. Functional test

- -> Release spring bracket lock of 8-pin connector -2- from connector of cable/multi-function switch.
- Unclip multi-function switch connector from bracket or remove bracket together with connector from gearbox to gain easier access to contacts in connector.



- -> Contact assignment on 8-pin connector for-function switch -F125 (to multi-function switch)

- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 8-pin connector on multi-function switch -F125

Switch on measuring range: Resistance measurement					
Test step	Contacts at - F125	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
1	1 + 7 1 + 6	Multi-function switch -F125	▪ Ignition switched off Selector lever in "P", "R", "N", "D", "4", "3" and "2"	Infinite ω1)	- Check connection at multi-function switch for contact corrosion, water damage or loose fitting If necessary, adjust selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism
	1 + 2		▪ Ignition switched off Selector lever in "P", "N" and "D"	Less than 2 ω	
			- Selector lever in "R", "4", "3" and "2"	Infinite ω1)	
	1 + 3		▪ Ignition switched off Selector lever in "R", "N" and "4"	Less than 2 ω	
(cont.) ▼			- Selector lever in "P", "D", "3" and "2"	Infinite ω1)	- Replace multi-function switch - F125 => Page. 18 ; Fig 12

- 1) Infinite ω equates to open circuit, i.e. switch is open.

Test for gearbox with 8-pin connector on multi-function switch -F125

Switch on measuring range: Resistance measurement					
Test step	Contacts at - F125	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
Continuation of 1	1 + 4		▪ Ignition switched off Selector lever in "N", "D", "4" and "2"	Less than 5 ω	- Check connection at multi-function switch for contact corrosion, water damage or loose fitting - If necessary, adjust selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism
			- Selector lever in "P", "R" and "3"	Infinite ω1)	
	1 + 5		▪ Ignition switched off Selector lever in "D", "4" and "3"	Less than 2 ω	
			- Selector lever in "P", "R", "N" and "2"	Infinite ω1)	

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(cont.) ▼	1 + 8	Reversing light signal	▪ Ignition switched off Selector lever in "R"	Less than 2 ω	- Replace multi-function switch - F125 => Page. 18 ; Fig 12
			- Selector lever in "P", "N" "D", "4", "3" and "2"	Infinite ω 1)	

1) Infinite ω equates to open circuit, i.e. switch is open.

Test for gearbox with 8-pin connector on multi-function switch -F125

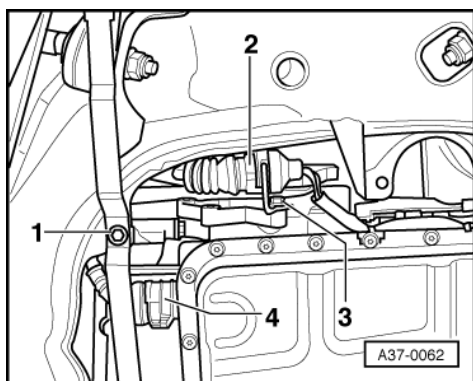
Switch on measuring range: Resistance measurement					
Test step	Contacts at - F125	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
Continuation of 1	6 + 7	P/N signal of multi-function switch	▪ Ignition switched off Selector lever in "R", "D", "4", "3" and "2"	Infinite ω 1)	- Replace multi- function switch - F125 => Page. 18 ; Fig 12
			▪ Ignition switched off Selector lever in "P", "N"	Less than 2 ω	The P/N signal for the engine control unit is checked.

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1) Infinite ω equates to open circuit, i.e. switch is open.

Notes:

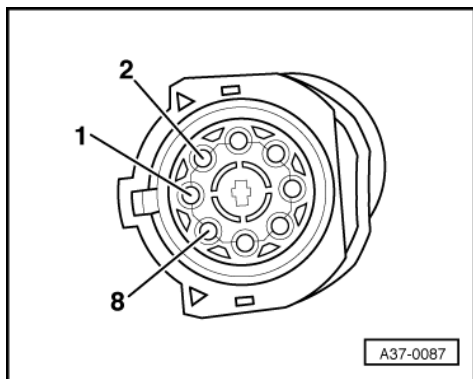
- ♦ If functional test is OK, check power supply of multi-function switch => Page 155



2. Checking power supply of 8-pin multi-function switch:

- -> Release spring bracket lock of 8-pin connector -2- from connector of cable/multi-function switch.

Test is carried out on connector with spring bracket lock (sockets) to gearbox control unit.



- -> Contact assignment on 8-pin connector for-function switch -F125 (to gearbox control unit)
- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

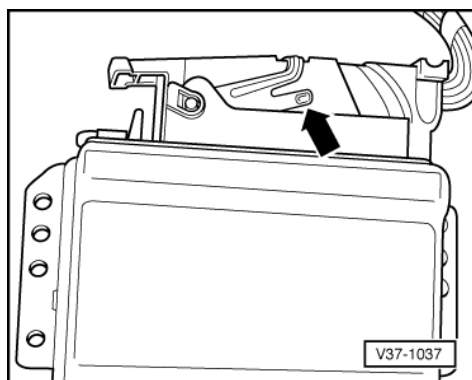
Switch on measuring range: voltage measurement		
Contacts of connector (socket)	Test conditions	Specified value
1 + 6	Ignition switch- ed on	approx. battery voltage

- In the event of deviations from specified value, check all fuses and wiring connections according to current flow diagram and remedy faults.

Notes:

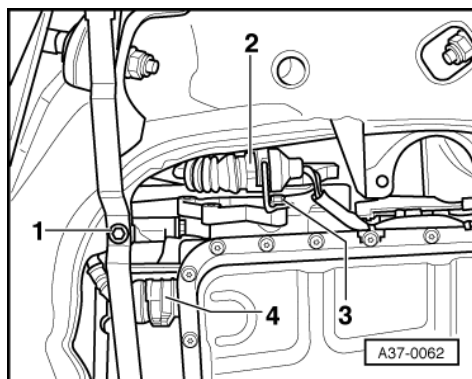
If functional test and power supply of multi-function switch is OK, check wiring connections of control unit -J217 to multi-function switch -F125 => Page 155 .

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3. Wiring check of control unit -J217 to 8-pin multi-function switch -F125

- -> For all tests ignition must be switched off, unplug multi-pin connector (connector plug) from control unit for automatic gearbox -J217 (control unit is at the front right in the plenum chamber in the electronics box => Page 3) and the test box V.A.G 1598/20 must be connected to the wiring harness connector.



- -> Connect the two 8-pin connectors -2- to multi-function switch (as shown in figure).
- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 8-pin connector on multi-function switch -F125

Switch on measuring range: voltage measurement



Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
1	36 + 34 36 + 6	Multi-function switch -F125	▪ Ignition switched on Selector lever in "P", "N" and "D"	approx. battery voltage	- Check connector to multi-function switch for contact corrosion - Check wiring according to current flow diagram - Check fuses Check power supply of -F125 => Page 155 - Check control unit wiring to 8-pin connector => Page 150
			- Selector lever in "R", "4", "3" and "2"	Less than 1 V	
	8 + 34 8 + 6		▪ Ignition switched on Selector lever in "R", "N" and "4"	approx. battery voltage	
	- Selector lever in "P", "D", "3" and "2"		Less than 1 V		
	37 + 34 37 + 6		- Selector lever in "N", "D", "4" and "2"	approx. battery voltage	
	- Selector lever in "P", "R", and "3"		Less than 1 V		
	9 + 34 9 + 6		- Selector lever in "D", "4" and "3"	approx. battery voltage	
	- Selector lever in "P", "R", "N", and "2"		Less than 1 V		

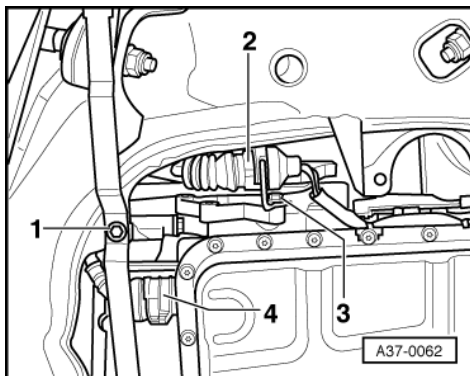
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Test for gearbox with 8-pin connector on multi-function switch -F125

Switch on measuring range: Resistance measurement						
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value	
2	36 + 8	Multi-function switch -F125	▪ Ignition switched off Selector lever in "N"	Less than 26 ω	- Check connector to multi-function switch for contact corrosion	
			- Selector lever in "P", "R", "D", "4", "3", "2"	Infinite ω 1)	- Check wiring between 88-pin control unit and 8-pin connector => Page 150	
	37 + 9		▪ Ignition switched off Selector lever in "D" and "4"	Less than 26 ω	- If necessary, adjust selector lever cable	
			- Fuse 31 disconnected 2) Selector lever in "P", "R", "N", "3" and "2"	Infinite ω 1)	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37; Servicing shift mechanism	
	37 + 36		▪ Ignition switched off Selector lever in "N" and "D"	Less than 26 ω	- Replace multi-function switch - F125 => Page. 18 ; Fig 12	

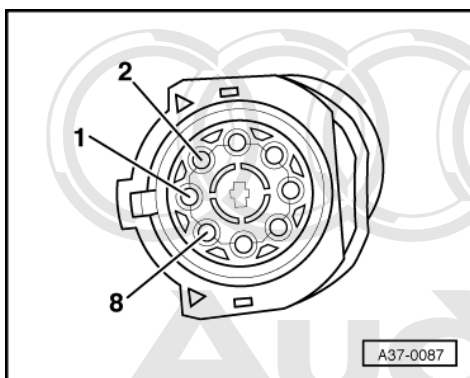
			- Selector lever in "P", "R", "4", "3" and "2"	Infinite ω 1)	
--	--	--	---	----------------------	--

- 1) Infinite ω equates to open circuit, i.e. switch is open.
- 2) Fuse for power supply of multi-function switch -F125-



4. Wiring check of control unit -J217 to 8-pin connector on multi-function switch

- Switch ignition off.
- -> Release spring bracket lock of 8-pin connector -2- from connector of cable/multi-function switch.



- -> Contact assignment on 8-pin connector for multi-function switch -F125 (sockets to gearbox control unit)

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Test is carried out between 8-pin connector with spring bracket lock (sockets) and test box V.A.G 1598/20 on connector of control unit.

- Use hand-held multimeter V.A.G 1526 A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 8-pin connector on multi-function switch -F125

Plug terminal	Test box V.A.G 1598/20, socket	Specified value	Action in the event of deviation from specified value
1	54, 55	$\leq 1.5 \omega$	- Remedy open circuit according to current flow diagram Check connector for: - Contact corrosion - Water damage - Leakage
2	36	$\leq 1.5 \omega$	
3	8	$\leq 1.5 \omega$	
4	37	$\leq 1.5 \omega$	
5	9	$\leq 1.5 \omega$	
6	6, 34	$\leq 1.5 \omega$	



Plug terminal	Test box V.A.G 1598/20, socket	Specified value	Action in the event of deviation from specified value
7	P/N signal for engine control unit	Functional test =>Page 152	
8	Reversing light signal		

20.6 - Test for multi-function switch with 10-pin connector

1. Functional test

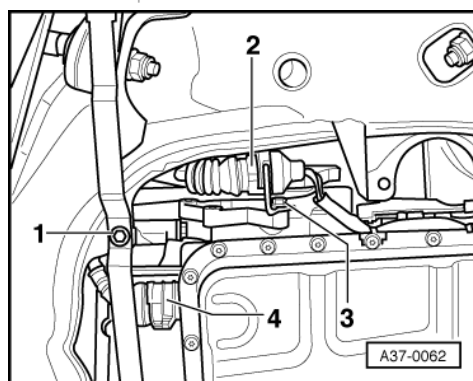
Notes:

The following functional tests differentiate between two different shift mechanisms.

- ♦ Shift mechanisms with selector lever positions PRND432, up to model year 2001, Test => Page 158 onwards
- ♦ Shift mechanisms with selector lever positions PRNDS, as of model year 2002, Test => Page 160 onwards

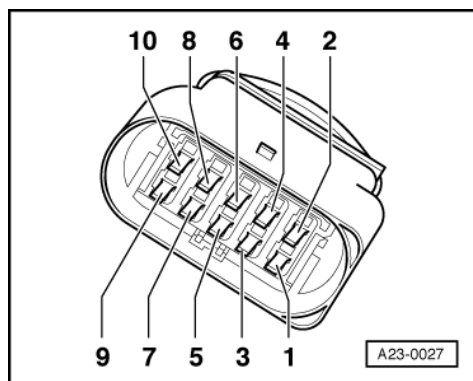
As of model year 2002, only selector lever positions "P", "R", "N", "D", "S" can be selected on shift mechanism. Selection of positions "4" "3" and "2" is no longer possible.

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Functional test for shift mechanisms with selector lever positions PRND432 (up to model year 2001)

- -> Unplug 10-pin connector -2- to multi-function switch.
- Unclip multi-function switch connector from bracket or remove bracket together with connector from gearbox to gain easier access to contacts in connector.



- -> Contact assignment on 10-pin connector for-function switch -F125 (to multi-function switch)
- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRND432

Switch on measuring range: Resistance measurement					
Test step	Contacts at - F1251)	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
1	1 + 2	Multi-function switch -F125	▪ Ignition switched off Selector lever in "P", "N" or "D"	Less than 1 ω	- Check connector at multi-function switch for contact corrosion, water damage or loose fitting
			- Selector lever in "R", "4", "3" and "2"	$\infty \omega$	- Check adjustment of selector lever cable
	1 + 3		- Selector lever in "R", "N" or "4"	Less than 1 ω	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37
			- Selector lever in "P", "D", "3" and "2"	$\infty \omega$	- Replace multi-function switch - F125 => Page. 18 ; Fig 12
	1 + 4		- Selector lever in "N", "D", "4" and "2"	Less than 1 ω	
			- Selector lever in "P", "R", and "3"	$\infty \omega$	
	1 + 5		- Selector lever in "D", "4" and "3"	Less than 1 ω	
			- Selector lever in "P", "R", "N" and "2"	$\infty \omega$	

1) Contact assignment on connector for multi-function switch.

- ♦ If functional test is OK, check power supply of multi-function switch => Page 155

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRND432

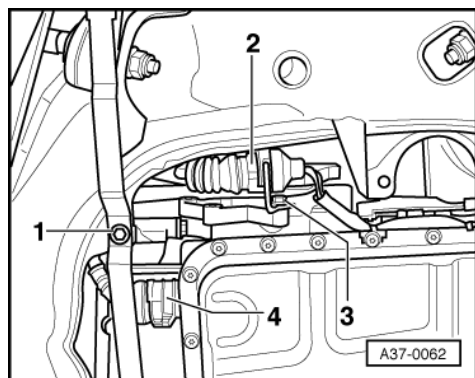
Switch on measuring range: Resistance measurement					
Test step	Contacts at - F1251)	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
2	9 + 10	P/N signal of multi-function switch	▪ Ignition switched off Selector lever in "R", "D", "4", "3" and "2"	$\infty \omega$	- Check connector at multi-function switch for contact corrosion, water damage or loose fitting
			- Selector lever in "P" or "N"	Less than 1 ω	- Check adjustment of selector lever cable



3	7 + 8	Reversing light signal of multi-function switch	▪ Ignition switched off Selector lever in "P", "N", "D", "4", "3" and "2"	$\infty \omega$	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37
			- Selector lever in "R"	Less than 1 ω	- Replace multi-function switch - F125 => Page. 18 ; Fig 12

1) Contact assignment on connector for multi-function switch

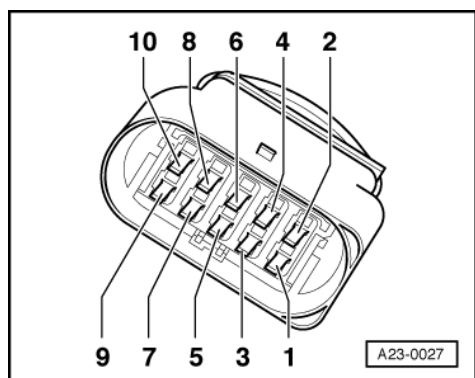
- ♦ If functional test is OK, check power supply of multi-function switch => Page 155



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Functional test for shift mechanisms with selector lever positions PRNDS (as of model year 2002)

- -> Unplug 10-pin connector -2- to multi-function switch.
- Unclip multi-function switch connector from bracket or remove bracket together with connector from gearbox to gain easier access to contacts in connector.



- -> Contact assignment on 10-pin connector for-function switch -F125 (to multi-function switch)
- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRNDS

Switch on measuring range: Resistance measurement					
Test step	Contacts at - F1251)	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

1	1 + 2	Multi-function switch -F125	▪ Ignition switched off Selector lever in "P", "N" or "D"	Less than 1 ω	- Check connector at multi-function switch for contact corrosion, water damage or loose fitting - Check adjustment of selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37 - Replace multi-function switch - F125 => Page. 18 ; Fig 12
			- Selector lever in "R" or "S"	$\infty \omega$	
	1 + 3		- Selector lever in "R", "N" or "S"	Less than 1 ω	
			- Selector lever in "P" or "D"	$\infty \omega$	
	1 + 4		- Selector lever in "N", "D" or "S"	Less than 1 ω	
			- Selector lever in "P" or "R"	$\infty \omega$	
	1 + 5		- Selector lever in "D" or "S"	Less than 1 ω	
			- Selector lever in "P", "R" or "N"	$\infty \omega$	

1) Contact assignment on connector for multi-function switch

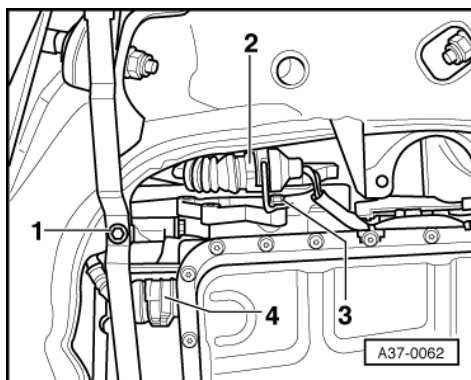
♦ If functional test is OK, check power supply of multi-function switch => Page 155

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRNDS

Switch on measuring range: Resistance measurement					
Test step	Contacts at - F1251)	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
2	9 + 10	P/N signal of multi-function switch	▪ Ignition switched off Selector lever in "R", "D" or "S"	$\infty \omega$	- Check connector at multi-function switch for contact corrosion, water damage or loose fitting - Check adjustment of selector lever cable => Automatic Gearbox 01V, FWD and 4WD; Repair group 37 - Replace multi-function switch - F125 => Page. 18 ; Fig 12
			- Selector lever in "P" or "N"	Less than 1 ω	
3	7 + 8	Reversing light signal of multi-function switch	▪ Ignition switched off Selector lever in "P", "N", "D" or "S"	$\infty \omega$	=> Automatic Gearbox 01V, FWD and 4WD; Repair group 37 - Replace multi-function switch - F125 => Page. 18 ; Fig 12
			- Selector lever in "R"	Less than 1 ω	

1) Contact assignment on connector for multi-function switch

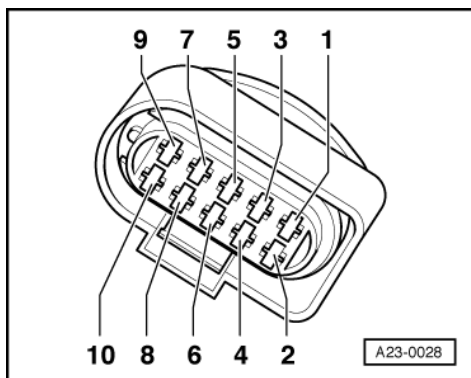
♦ If functional test is OK, check power supply of multi-function switch => Page 155



2. Checking power supply of 10-pin multi-function switch:

- -> Unplug 10-pin connector -2- to multi-function switch.
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Test is carried out on connector (sockets) to gearbox control unit.



- -> Contact assignment on 10-pin connector for multi-function switch -F125 (sockets to gearbox control unit)
- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Switch on measuring range: voltage measurement		
Contacts of connector (socket)	Test conditions	Specified value
1 + 10 7 + 10	▪ Ignition switch- ed on	approx. battery voltage

- In the event of deviations from specified value, check all fuses and wiring connections according to current flow diagram and remedy faults.

Notes:

If functional test and power supply of multi-function switch is OK, check wiring connections of control unit -J217 to multi-function switch -F125 => Page 163.

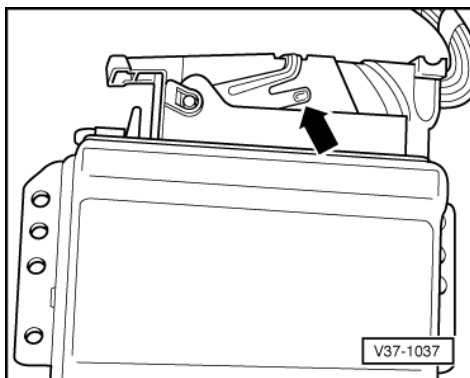
3. Wiring check of control unit -J217 to 10-pin multi-function switch -F125

Notes:

The following wiring checks differentiate between two different shift mechanisms.

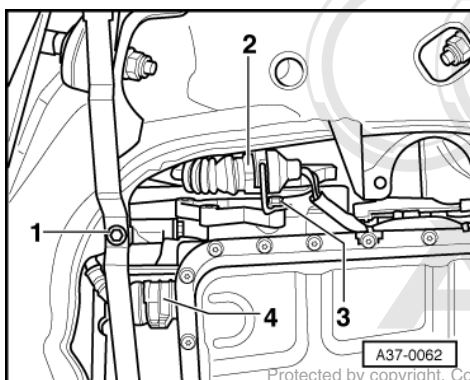
- ♦ Shift mechanisms with selector lever positions PRND432, up to model year 2001, Test => Page 163 onwards
- ♦ Shift mechanisms with selector lever positions PRNDS, as of model year 2002, Test => Page 165 onwards

As of model year 2002, only selector lever positions "P", "R", "N", "D", "S" can be selected on shift mechanism. Selection of positions "4", "3" and "2" is no longer possible.



Wiring check of control unit -J217 to 10-pin multi-function switch -F125, only for shift mechanisms with selector lever positions PRND432 (up to model year 2001)

- -> For all tests ignition must be switched off, unplug multi-pin connector (connector plug) from control unit for automatic gearbox -J217 (control unit is at the front right in the plenum chamber in the electronics box => Page 3) and the test box V.A.G 1598/20 must be connected to the wiring harness connector.



- -> Connect the two 10-pin connectors -2- to multi-function switch (as shown in figure).
- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRND432

Switch on measuring range: voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
1	54 + 34 54 + 6 55 + 34 55 + 6	Voltage supply	▪ Ignition switched on	approx. battery voltage	- Check fuses Check wiring according to current flow diagram
2	36 + 34 36 + 6	Multi-function switch -F125	▪ Ignition switched on Selector lever in "P", "N" and "D"	approx. battery voltage	- Check connector to multi-function switch for contact corrosion
			- Selector lever in "R", "4", "3" and "2"	Less than 1 V	- Check wiring according to current flow diagram



(cont.) ▼	8 + 34 8 + 6		▪ Ignition switched on Selector lever in "R", "N" and "4"	approx. battery voltage	- Checking power supply of multi- function switch =>Page 162
			- Selector lever in "P", "D", "3" and "2"	Less than 1 V	- Check line con- nection of control unit to 10-pin con- nector => Page 167

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRND432

Switch on measuring range: voltage measurement						
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value	
Continuation of 2	37 + 34 37 + 6		- Selector lever in "N", "D", "4" and "2"	approx. battery voltage	- Check connector to multi-function switch for contact corrosion	
			- Selector lever in "P", "R", and "3"	Less than 1 V	- Check wiring ac- cording to current flow diagram	
	9 + 34 9 + 6		- Selector lever in "D", "4" and "3"	approx. battery voltage	- Checking power supply of multi- function switch =>Page 162	
			- Selector lever in "P", "R", "N", and "2"	Less than 1 V	- Check line con- nection of control unit to 10-pin con- nector => Page 167	

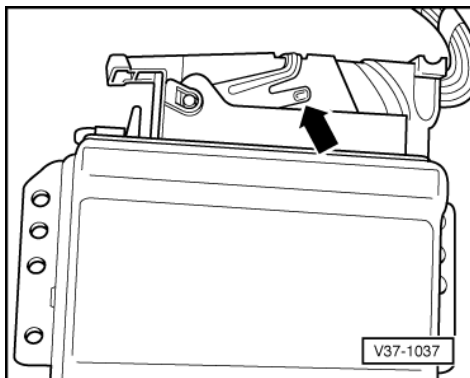
Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRND432

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
3	55 + 54	Multi-function switch -F125	▪ Ignition switched off	Less than 1.5 ω	- Check connec- tor to multi-func- tion switch for contact corrosion - Check wiring between 88-pin control unit and 10-pin connector => Page 150
	55 + 36		▪ Ignition switched off Selector lever in "P", "N" and "D"	Less than 1.5 ω	
			- Selector lever in "R", "4", "3" and "2"	Infinite ω 1)	
	55 + 8		▪ Ignition switched off Selector lever in "R", "N" and "4"	Less than 1.5 ω	
(cont.) ▼			- Selector lever in "P", "D", "3" and "2"	Infinite ω 1)	

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRND432

Switch on measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
Continuation of 3	55 + 37	Multi-function switch -F125	▪ Ignition switched off Selector lever in "N", "D", "4" and "2"	Less than 1.5 ω	- Check connector to multi-function switch for contact corrosion - Check wiring between 88-pin control unit and 10-pin connector => Page 150
			- Selector lever in "P", "R", and "3"	Infinite ω 1)	
	55 + 9		▪ Ignition switched off Selector lever in "D", "4" and "3"	Less than 1.5 ω	
			- Selector lever in "P", "R", "N" and "2"	Infinite ω 1)	

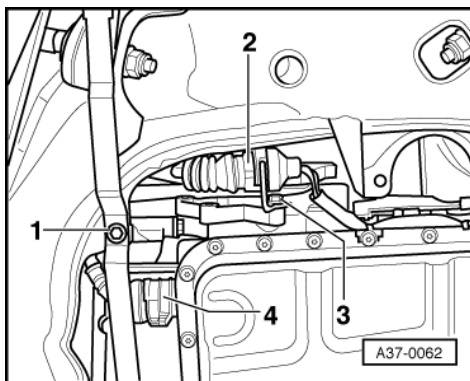
1) Infinite ω equates to open circuit, i.e. switch is open.



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Wiring check of control unit -J217 to 10-pin multi-function switch -F125, only for shift mechanisms with selector lever positions PRNDS (as of model year 2002)

- -> For all tests ignition must be switched off, unplug multi-pin connector (connector plug) from control unit for automatic gearbox -J217 (control unit is at the front right in the plenum chamber in the electronics box => Page 3) and the test box V.A.G 1598/20 must be connected to the wiring harness connector.





- -> Connect the two 10-pin connectors -2- to multi-function switch (as shown in figure).
- Use hand-held multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRNDS

Switch on measuring range: voltage measurement						
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value	
1	54 + 34 54 + 6 55 + 34 55 + 6	Voltage supply	▪ Ignition switched on	approx. battery voltage	- Check fuses Check wiring according to current flow diagram.	
2 (cont.) ▼	36 + 34 36 + 6	Multi-function switch -F125	▪ Ignition switched on Selector lever in "P", "N" and "D"	approx. battery voltage	- Check connector to multi-function switch for contact corrosion	
			- Selector lever in "R", "S"	Less than 1 V	- Check wiring according to current flow diagram	
	8 + 34 8 + 6		▪ Ignition switched on Selector lever in "R", "N" and "S"	approx. battery voltage	- Checking power supply of multi-function switch =>Page 162	
			- Selector lever in "P", "D"	Less than 1 V	- Check line connection of control unit to 10-pin connector => Page 167	

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRNDS

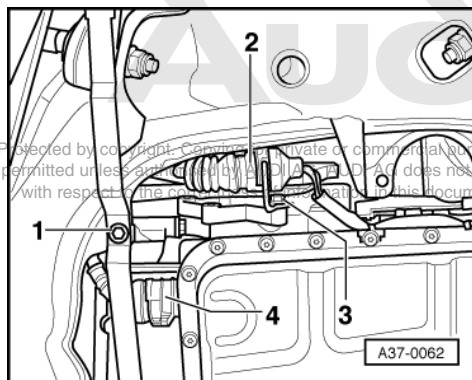
Switch on measuring range: voltage measurement						
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value	
Continuation of 2	37 + 34 37 + 6		- Selector lever in "N", "D", "S"	approx. battery voltage	- Check connector to multi-function switch for contact corrosion	
			- Selector lever in "P", "R"	Less than 1 V	- Check wiring according to current flow diagram	
	9 + 34 9 + 6		- Selector lever in "D", "S"	approx. battery voltage	- Checking power supply of multi-function switch =>Page 162	
			- Selector lever in "P", "R" and "N"	Less than 1 V	- Check line connection of control unit to 10-pin connector => Page 167	

Test for gearbox with 10-pin connector on multi-function switch -F125, shift mechanism with PRNDS

Switch on measuring range: Resistance measurement

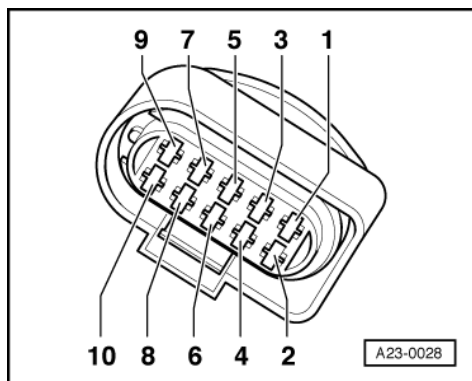
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
3	55 + 36	Multi-function switch -F125	▪ Ignition switched off Selector lever in "P", "N" or "D"	Less than 1.5 ω	- Check connector to multi-function switch for contact corrosion - Check wiring between 88-pin control unit and 10-pin connector => Page 150
			- Selector lever in "R" or "S"	Infinite ω 1)	
	55 + 8		- Selector lever in "R", "N" or "S"	Less than 1.5 ω	
			- Selector lever in "P" or "D"	Infinite ω 1)	
	55 + 37		- Selector lever in "N", "D" or "S"	Less than 1.5 ω	
			- Selector lever in "P" or "R"	Infinite ω 1)	
	55 + 9		- Selector lever in "D" or "S"	Less than 1 ω	
			- Selector lever in "P", "R" or "N"	Infinite ω 1)	

1) Infinite ω equates to open circuit, i.e. switch is open.



4. Wiring check of control unit -J217 to 10-pin connector on multi-function switch

- Switch ignition off.
- -> Unplug 10-pin connector -2- to multi-function switch.



- -> Contact assignment on 10-pin connector for multi-function switch -F125 (sockets to gearbox control unit)



Test is carried out between 10-pin connector (sockets) and test box V.A.G 1598/20 on connector of control unit .

- Use hand-held multimeter V.A.G 1526 A or vehicle diagnostic, testing and information system VAS 5051.

Test for gearbox with 10-pin connector on multi-function switch -F125

Plug terminal	Test box V.A.G 1598/20, socket	Specified value	Action in the event of deviation from specified value
1	54, 55	$\leq 1.5 \omega$	- Remedy open circuit according to current flow diagram Check connector for: - Contact corrosion - Water damage - Leakage
2	36	$\leq 1.5 \omega$	
3	8	$\leq 1.5 \omega$	
4	37	$\leq 1.5 \omega$	
5	9	$\leq 1.5 \omega$	
6 : Not used			
7	54, 55	$\leq 1.5 \omega$	
8	Reversing light signal	Functional test	
9	P/N signal for engine control unit	=>Page 158	
10	6, 34	$\leq 1.5 \omega$	

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