

Audi A4 1995 ➤

Automatic Gearbox 01V Self-diagnosis									
Gearbox ID	CJP	CJQ	CJR	CJU	CJV	CJW	DCS	DDS	DDT
	DEQ	DES	DEV	DEY	DKB	DRD	DRK	DRN	DSS
	DST	DTU	DTV	EBU	EBV	EBW	ECB	ECC	ECG
	EDF	EEK	EFE	EFP	EFQ	EFR	EKC	EKD	EMA
	EMK	EMP	ETU	ETV	ETZ	EZP	EZR	EZS	EZV
	EZW	EZX	EZY	EZZ	FAL	FAM	FAN	FAP	FAQ
	FAR	FAS	FEV	FHH	FHJ	FNM	FRT	FRU	

Edition 02.1999



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Audi A4 1995 ➤

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.

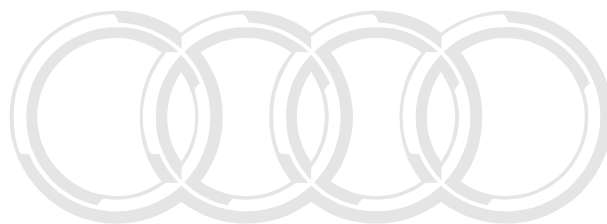
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01 - Self-diagnosis, Electrical check

1 - Self-diagnosis function

1.1 - Self-diagnosis function

The automatic gearbox features electronic/hydraulic control.

The automatic gearbox control unit -J217 receives information from components which influence gear selection. The control unit uses this information to actuate the appropriate solenoid valves in the valve body. The solenoid valves pass the fluid pressure generated by the ATF pump to the clutches/brakes to be applied in each case.

Gearbox control unit fault recognition

The term "self-diagnosis" relates to the electrical/electronic section of the control system.

To enable the cause of the problem to be rapidly established in the event of failure of an electrical/electronic component or an open circuit in the wiring, the control unit is equipped with a fault memory.

Faults are detected by way of electrical signals. Faults occurring in monitored sensors or components are thus stored in the fault memory together with an indication of the type of fault and its location.

The first time a fault occurs, it is stored as being static. Once the fault is no longer present, it initially becomes a sporadic fault (SP).

Faults stored in the fault memory as sporadic faults are displayed as "sporadic faults" on fault memory interrogation. "SP" then appears on the right of the display. Provided that the printer is switched on, "sporadic fault" is printed out after the fault designation.

Faults stored in the fault memory as sporadic faults are automatically erased after 40 engine cold starts (with subsequent gearbox warm-up).

Full use of the features offered by the self-diagnosis function can only be made using the vehicle diagnostic, testing and information system VAS 5051 or the fault reader V.A.G 1551 in mode 1 "Rapid data transfer".

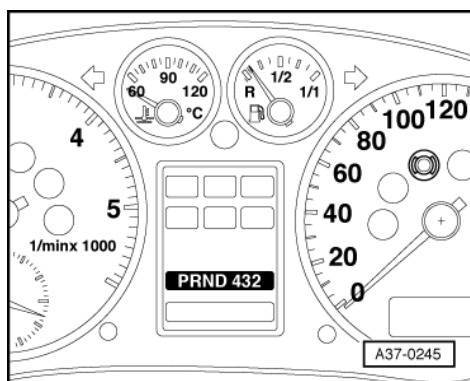
For a list of functions covered by the vehicle diagnostic, testing and information system VAS 5051, refer to => Page 25, List of available functions.

Gearbox control unit safety functions

In the event of failure of one or more components/sensors, automatic gearbox control unit -J217 activates appropriate substitute functions or emergency running programs. This ensures non-destructive operation of the automatic gearbox with the corresponding effects on gearshift function and quality.

If critical faults occur with automatic gearbox control unit -J217 active, the currently engaged gear is initially retained. As soon as the driving situation permits in terms of gearbox and driving safety, the automatic gearbox control unit -J217 activates "mechanical emergency running with active control unit".

Mechanical emergency running with active control unit

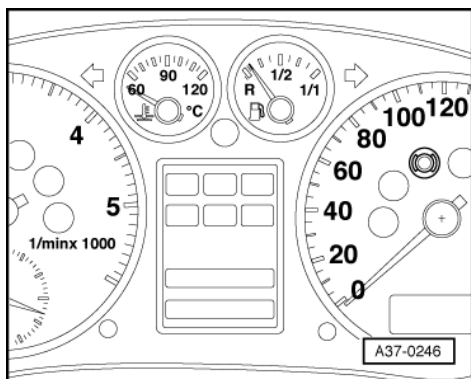




- Gearbox shifts out of all forward gears into hydraulic 4th gear. Torque converter clutch is disengaged. All solenoid valves are deenergised.
- Maximum shift pressure is applied to transmission elements.
- Reverse gear can be engaged. Selector lever lock (in "P" and "N") is active.
- -> All segments of gear selection indicator are fully illuminated.

In the event of automatic gearbox control unit -J217 failure (e. g. power supply failure or unplugging of connector) gearbox operation is immediately switched to "mechanical emergency running with control unit not active".

Mechanical emergency running with control unit not active



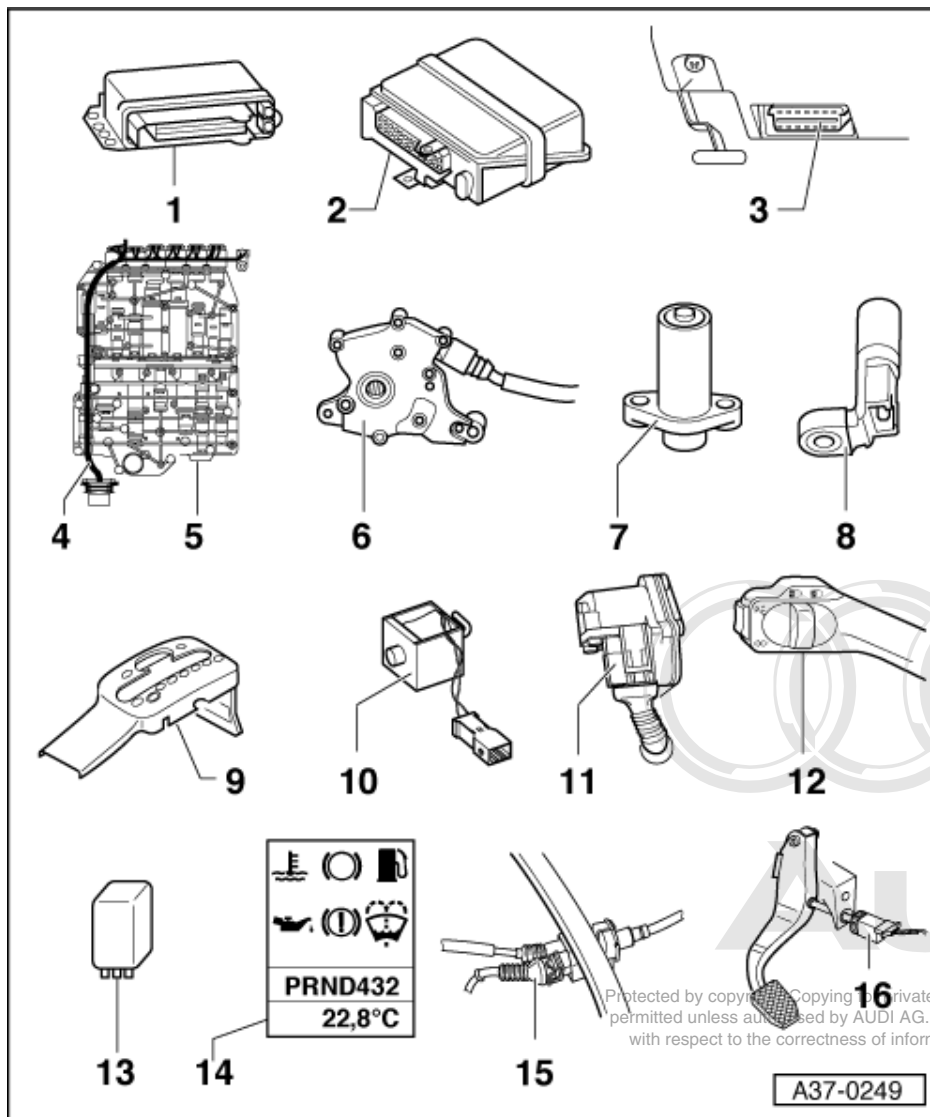
- Gearbox shifts out of all forward gears into hydraulic 4th gear. Torque converter clutch is disengaged. All solenoid valves are deenergised.
- Maximum shift pressure is applied to transmission elements.
- Reverse gear can be engaged. Selector lever lock (in "P" and "N") is not active.
- -> All segments of gear selection indicator are blank.
- Automatic gearbox control unit -J217 is completely out of operation, i.e. self-diagnosis cannot be performed.

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
Encoding control unit	yes
Reading measured value block	yes
Electrical/electronic components and fitting locations	=> Page 3

2 - Electrical/electronic components and fitting locations

2.1 - Electrical/electronic components and fitting locations

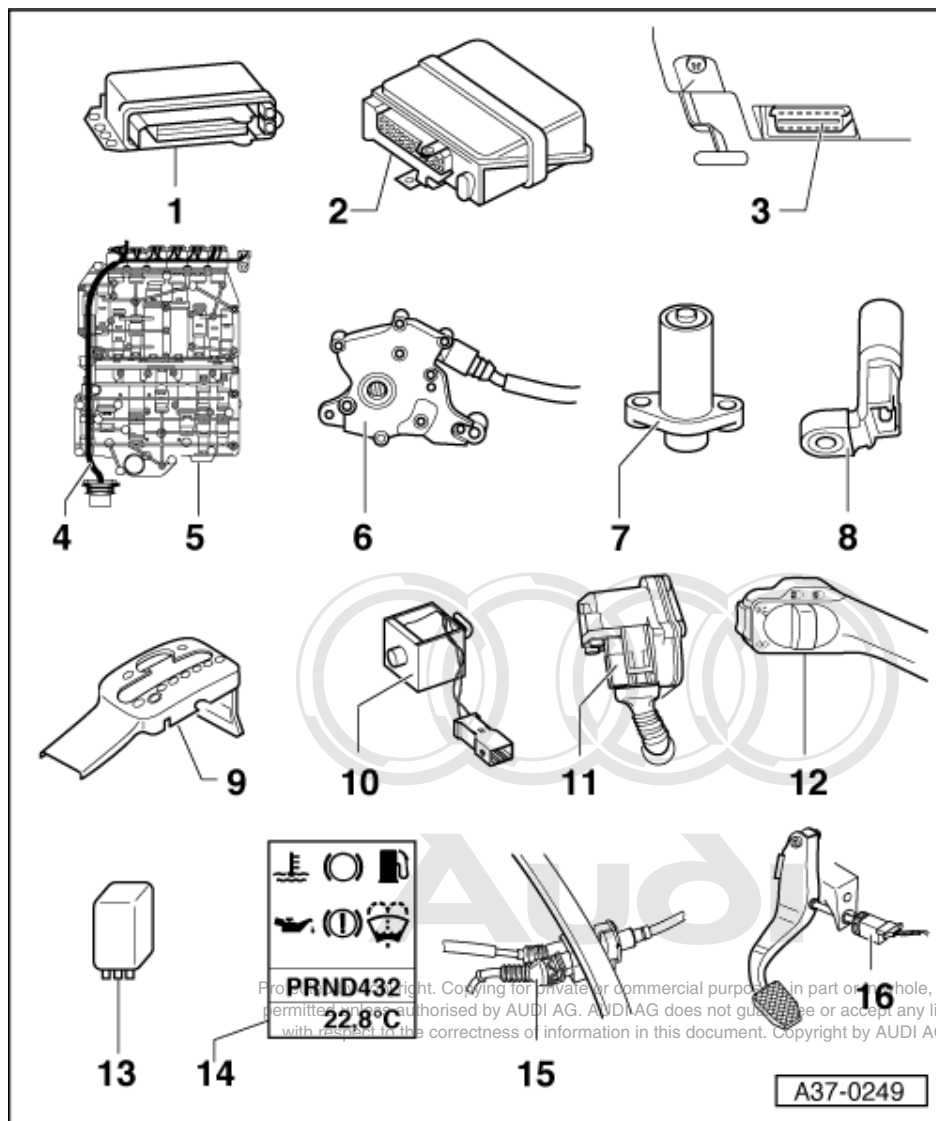


1 Automatic gearbox control unit -J217

- ◆ Fitting location => Fig. 12
- ◆ Removing and installing => Fig. 12
- ◆ Disconnecting multi-pin connector
=> Fig. 13
- ◆ Control unit is checked by way of self-diagnosis => Perform self-diagnosis

2 Engine control unit

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



3 Diagnostic connection

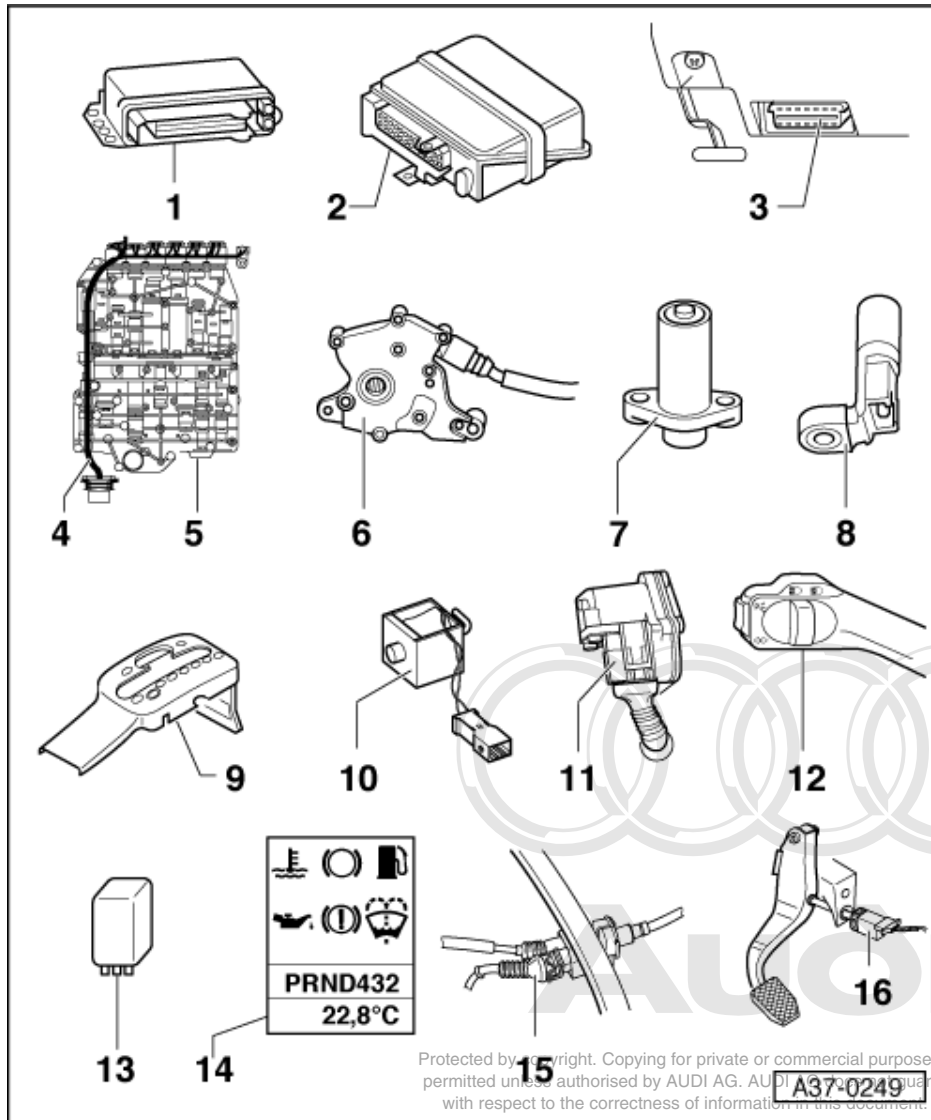
- ◆ Fitting location => Fig. 14

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

- ◆ Fitting location => Fig. 15
- ◆ -G93 is checked by way of self-diagnosis

5 Valve body

- ◆ Fitting location => Fig. 14
- ◆ Solenoid valves -N88, -N89, -N90, -N91, -N92, -N93 and -N94 are attached to valve body
- ◆ Components are checked by way of self-diagnosis



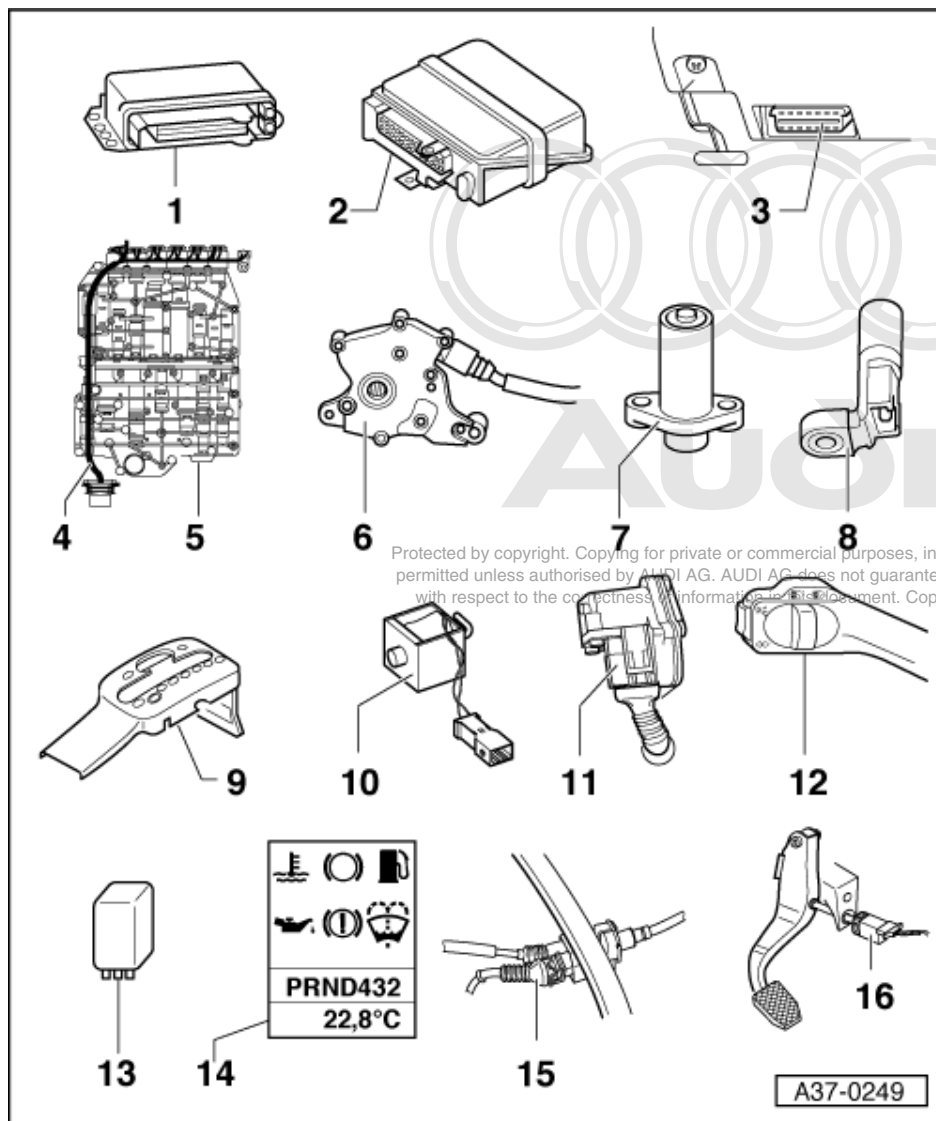
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6 Multi-function switch -F125

- ♦ Fitting location/removing and installing =>Fig. 15
- ♦ Checked by self-diagnosis
- ♦ Can be checked in measured value block => Page 123

7 Gearbox input speed sender -G182

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

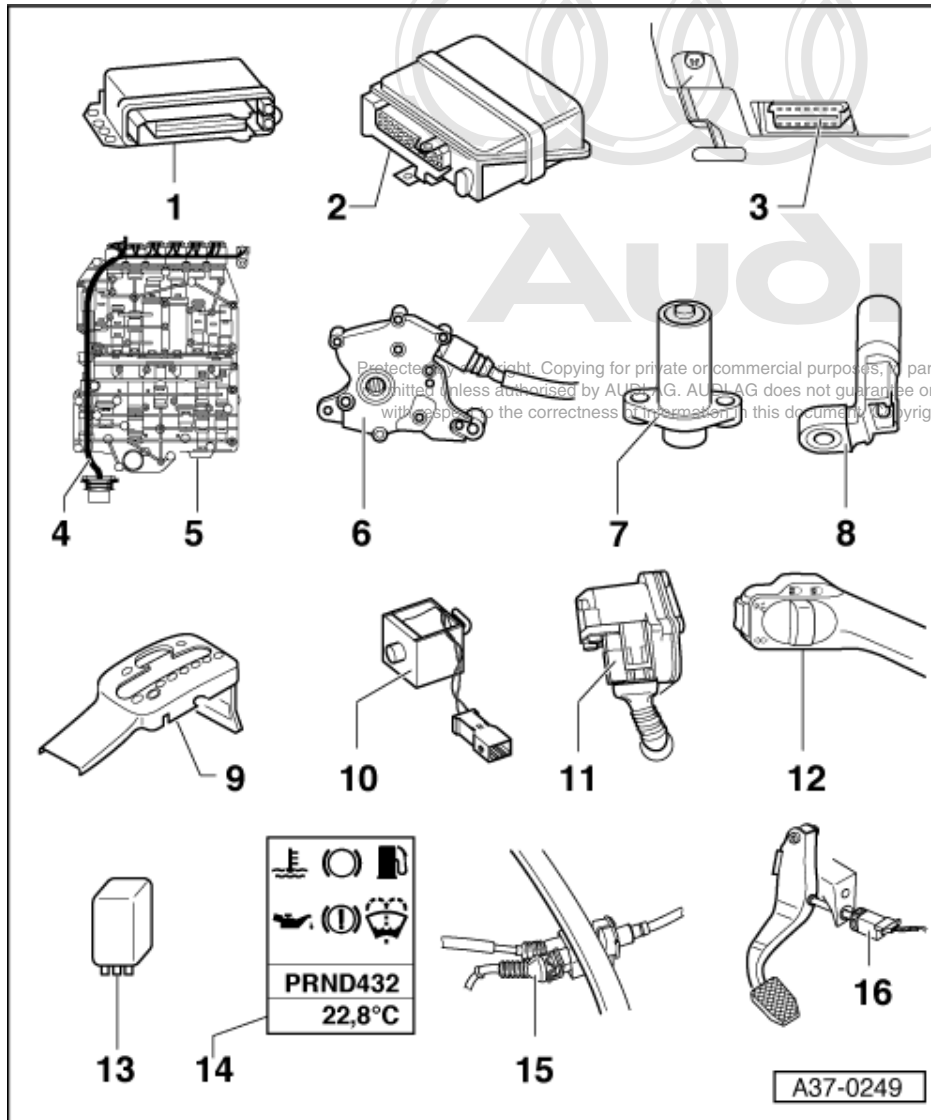


8 Gearbox speed sender -G38 (also referred to as gearbox output speed sender -G195)

- ◆ Fitting location/removing and installing =>Fig. 17
- ◆ Checked by self-diagnosis
- ◆ Measures gearbox output speed

9 Tiptronic switch -F189

- ◆ Fitting location/removing and installing =>Fig. 16
- ◆ Can be checked in measured value block => Page 123

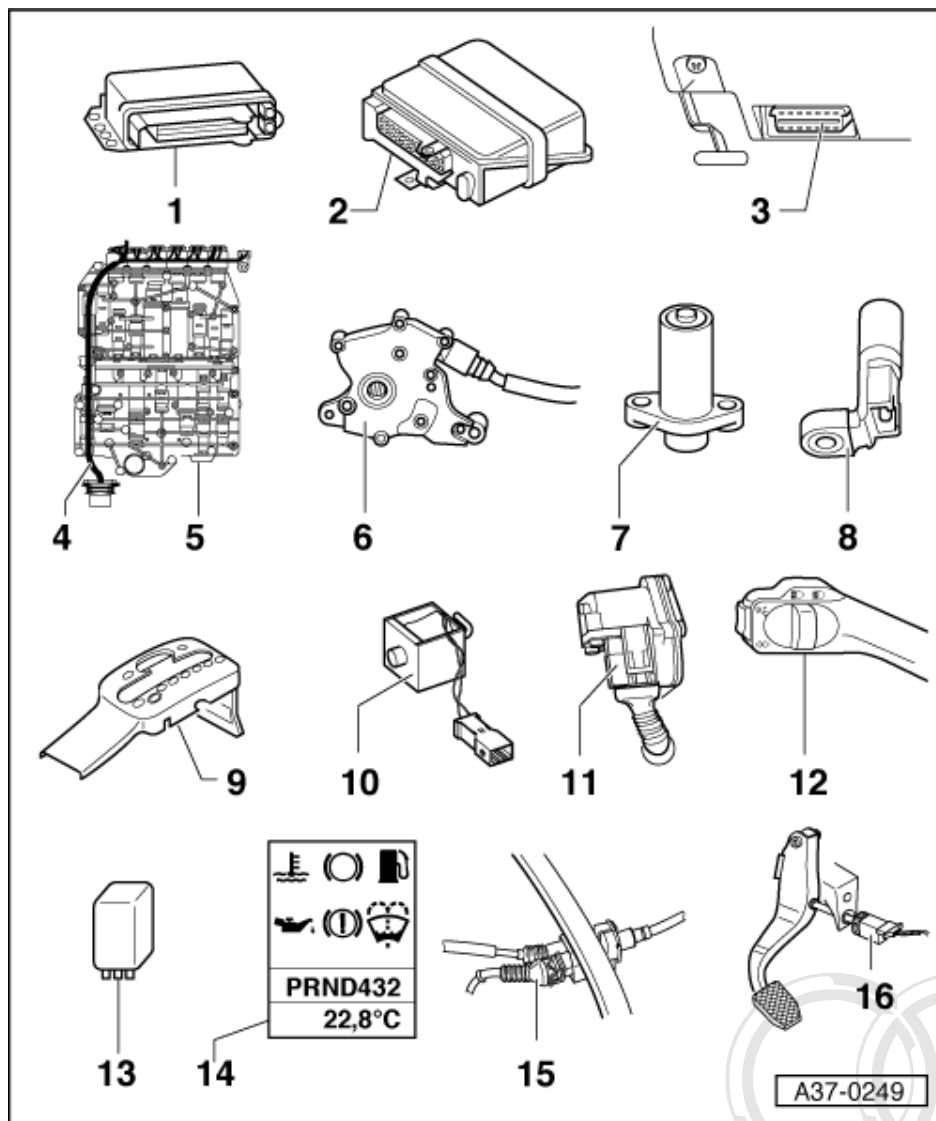


10 Selector lever lock solenoid -N110

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

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism; Dismantling and assembling shift mechanism Servicing shift mechanism Dismantling and assembling shift mechanism

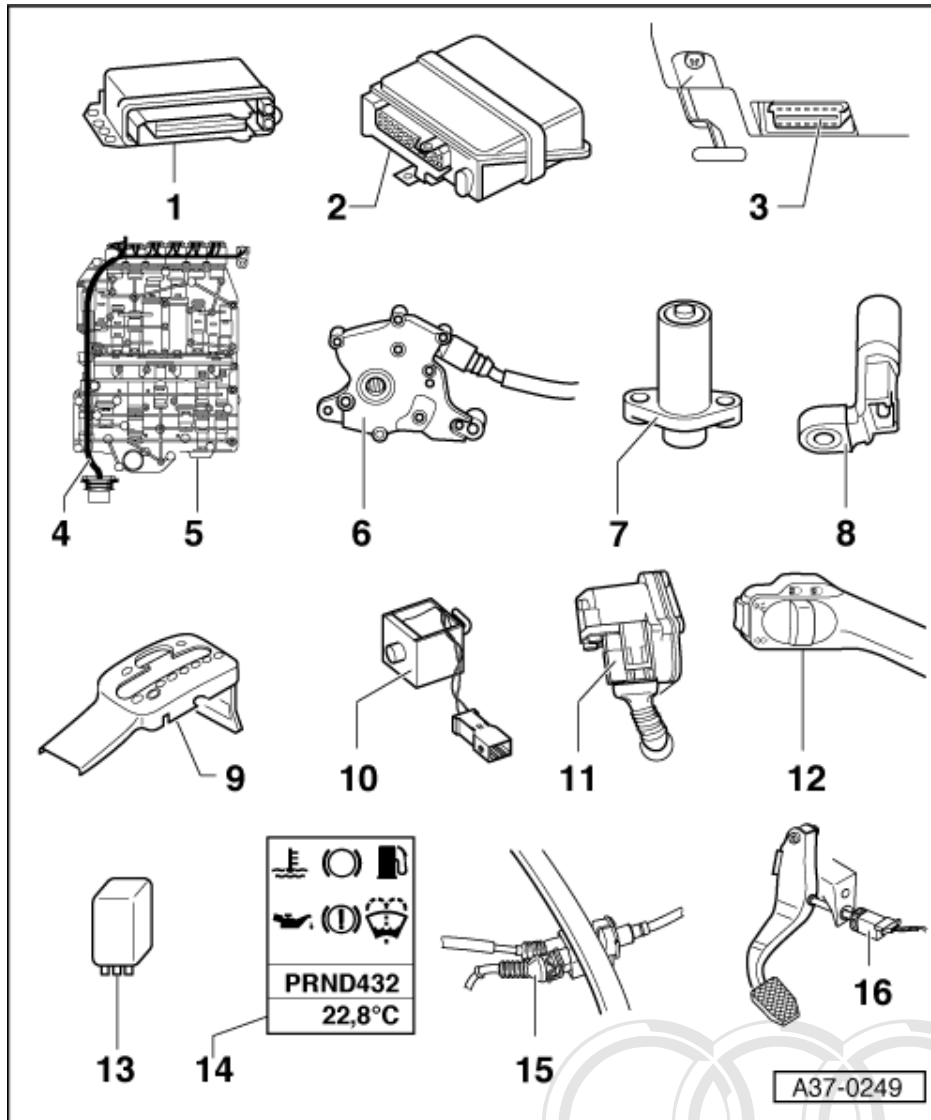
- ♦ Can be checked in measured value block => Page 123



11 Throttle valve potentiometer -G69

- ♦ Fitting location => Fig. 19
- ♦ Throttle valve potentiometer signal is checked by way of self-diagnosis
- ♦ Signal is transmitted from throttle valve potentiometer via engine control unit to gearbox control unit. Signal can only be checked in measured value block => Page 84 . If throttle valve potentiometer is displayed as being faulty in self-diagnosis, self-diagnosis of engine control unit is always to be performed as well
=> Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis

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12 Cruise control system switch -E45

- ♦ Fitting location: Cruise control system switch is located at steering column switch
- ♦ Removing and installing

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

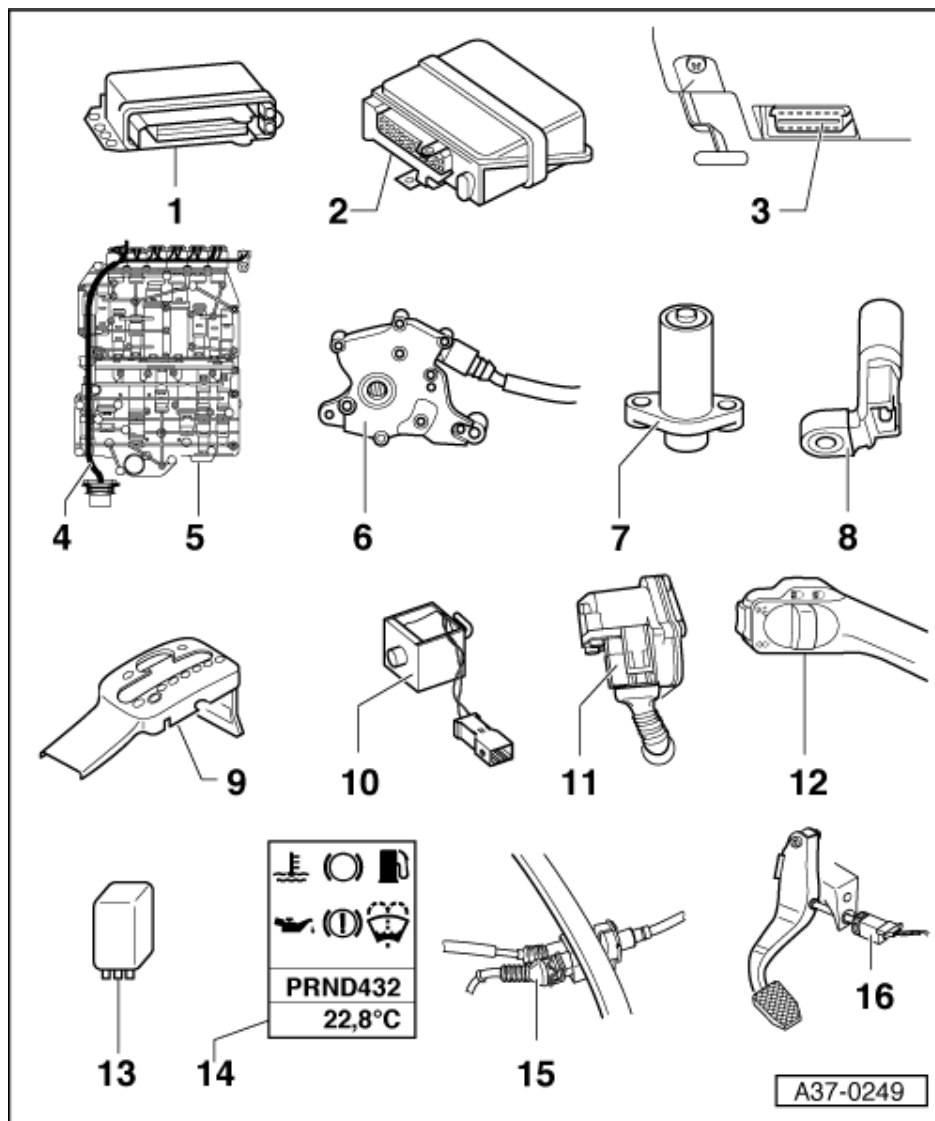
- ♦ Can be tested as part of Electrical Check => Page 123

13 Starter inhibitor relay -J207

- ♦ Fitting location => Fig. 19

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

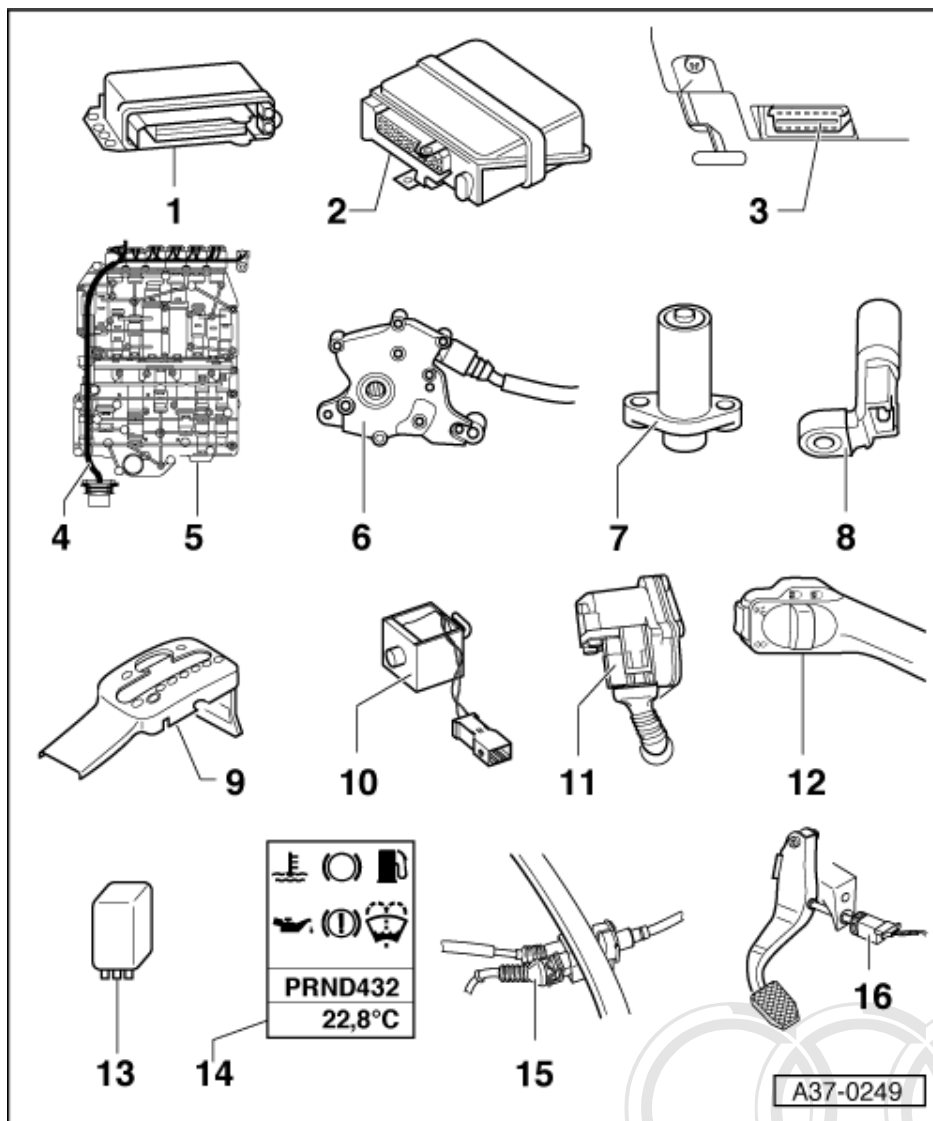
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**14 Selector lever position indicator -Y6**

- ◆ Fitting location => Fig. 20
- ◆ Blank gear display is an indication of emergency running with gearbox control unit not active
- ◆ Fully illuminated gear display is an indication of emergency running with gearbox control unit active

15 Kickdown switch -F8

- ◆ Fitting location => Fig. 20
- ◆ Can be checked in measured value block => Page 123

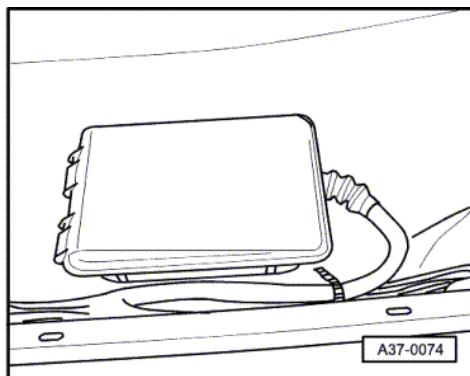


16 Brake light switch -F

- ♦ Fitting location => Fig. 21
- ♦ 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 123



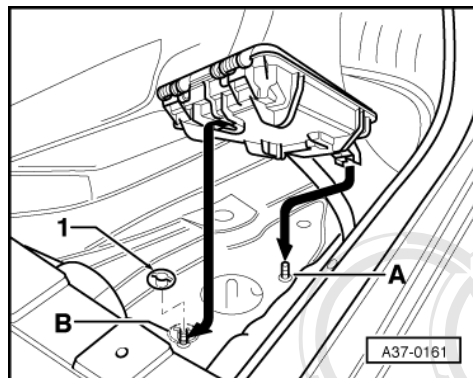
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-> Fig.1 Fitting location of automatic gearbox control unit -J217

Control unit is located in front of right seat beneath floor covering in footwell.

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

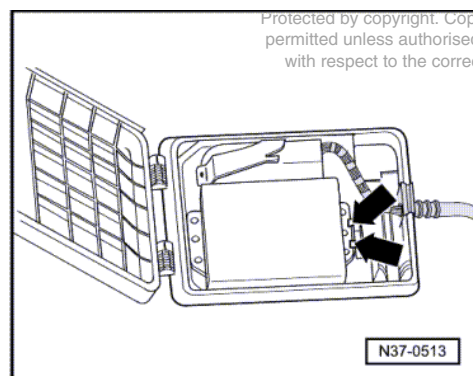
Removing



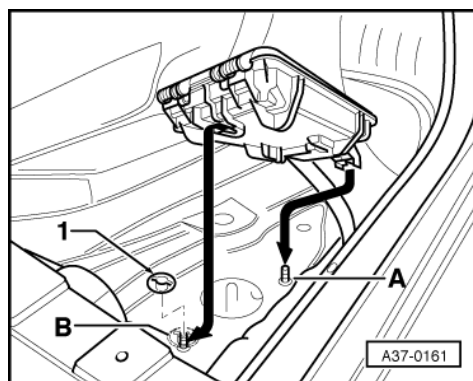
- Remove lower right A-pillar trim and right door sill panel trim in area of front right door.

=> General Body Repairs; Repair Group 70; Trim Panels Trim Panels

- Detach floor covering from right inner sill in area of front door and fold back approx. 20 cm.
- -> Unclip box at A and lift up.
- Unclip box at B as illustrated.



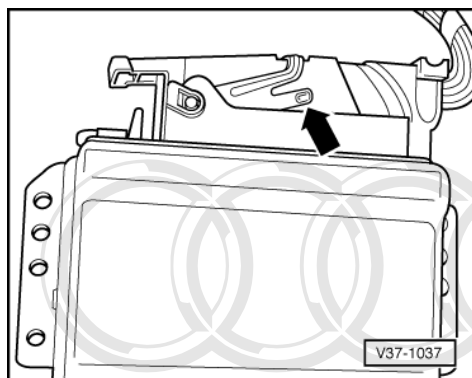
- -> Unclip control unit from box -arrows-.
 - Release multi-pin connector and then detach from control unit
- => Fig. 3 .



Installing:

Install in reverse order. The following additional steps are required:

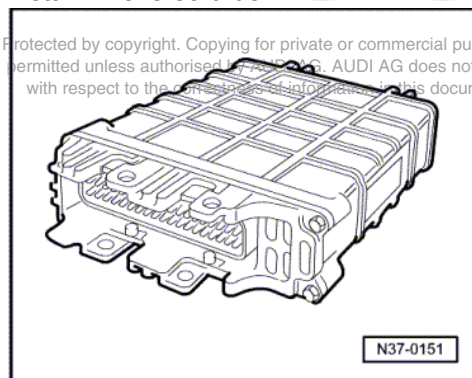
- Check firm fit of clip nut -1-.



-> Fig.3 Disconnecting automatic gearbox control unit -J217 from multi-pin connector

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

Install in reverse order.

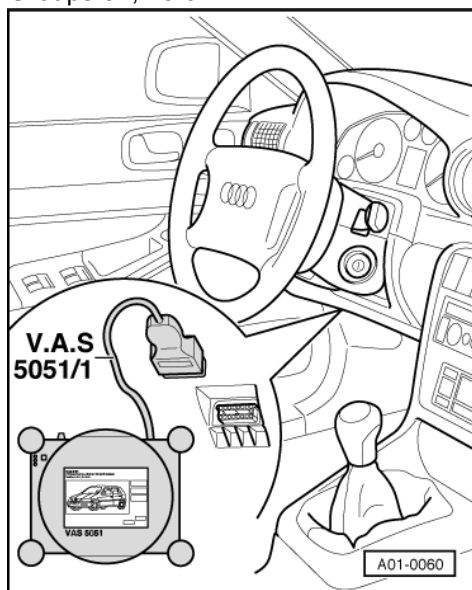


-> Fig.4 Engine control unit

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

Removing and installing control unit

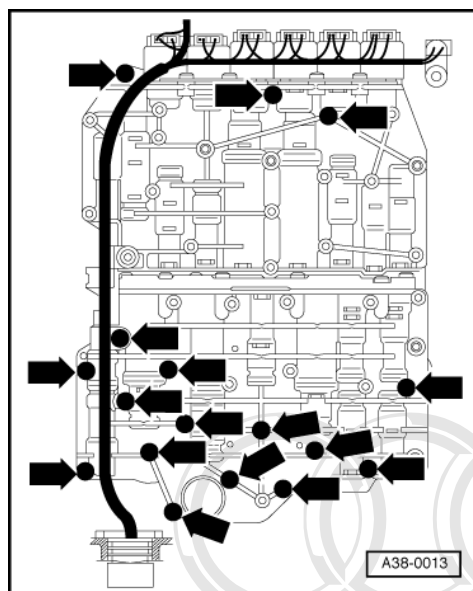
Removal and installation of control unit is described in the corresponding engine Workshop Manual in Repair Groups 01, 23 or 24.



-> Fig.5 Diagnostic connection

Fitting location: Diagnostic connection is located beneath knee restraint on left of steering wheel.

- Use diagnostic wire VAS 5051/1 to connect up vehicle diagnostic, testing and information system VAS 5051. Alternatively, use can be made of diagnostic wire V.A.G 1551/3 to connect up fault reader V.A.G 1551.
- Enter address word "02 Gearbox electronics" and continue switching until "Select function XX" appears in display => Page 22 onwards.



-> Fig.6 Valve body

Fitting location: Valve body is bolted to bottom of gearbox housing and covered by gearbox sump.

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

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Removing and installing valve body

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing valve body
Removing and installing valve body

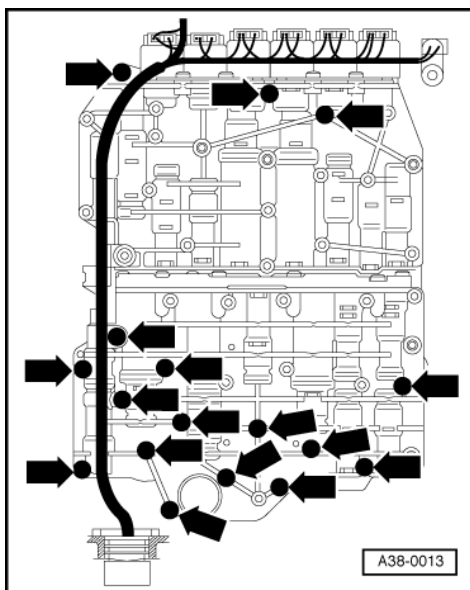
A distinction is made between two types of gearbox:

Gearbox with hydraulic control E17 on which gearbox input speed sender (inductive pick-up) is attached to underside of valve body.

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

Information as to which gearbox is concerned can be found in the following Workshop Manual in the Repair Group given:

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features
Code letters, assignment of mechanical units, transmission ratios, features



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

Fitting location: Wiring harness is attached to valve body.

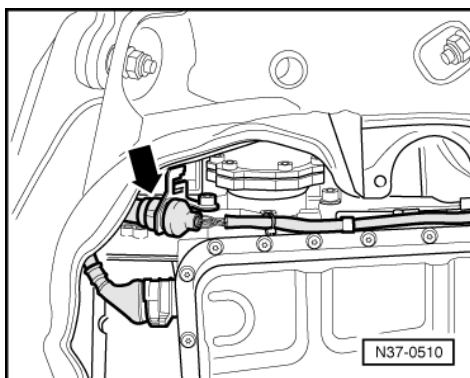
Wiring harness can be replaced with gearbox installed and valve body removed.

Removing and installing wiring harness in gearbox

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox Removing and installing sump, ATF screen and valve body Removing and installing wiring harness in gearbox

Removing and installing gearbox oil temperature sender (ATF) -G93

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Replacing gearbox oil temperature sender (ATF) -G93 Removing and installing sump, ATF screen and valve body Replacing gearbox oil temperature sender (ATF) -G93



-> Fig.8 Multi-function switch -F125

Fitting location: Multi-function switch is located on left of gearbox, connector for multi-function switch -arrow-.

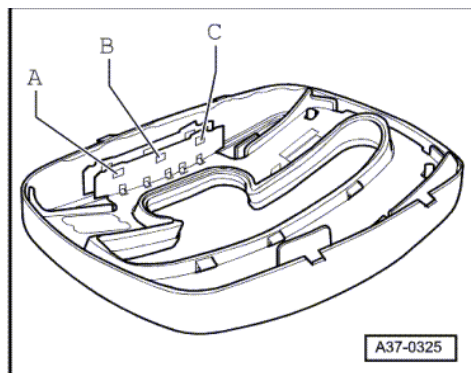
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Use is made of two different multi-function switches:

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 Front and Four-wheel Drive; Repair Group 38; Replacing multi-function switch
Replacing multi-function switch



-> Fig.9 Tiptronic switch -F189

Fitting location: Tiptronic switch is integrated into printed circuit board of symbol panel, which is located in the shift mechanism cover.

Note:

This switch is not installed for shift mechanisms with no Tiptronic function.

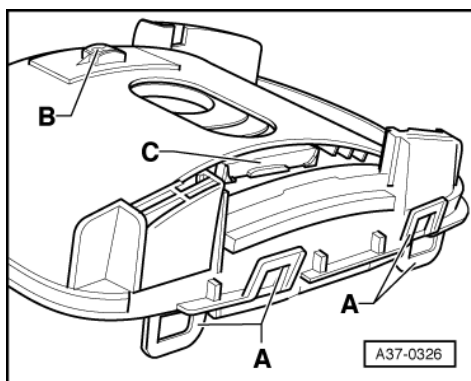
It consists of 3 Hall sensors (-A-, -B-, -C-) which are actuated by a magnet on the transverse slide of the masking panel.

- A - Change-down sensor
- B - Tiptronic recognition sensor
- C - Change-up sensor

Note:

A distinction is made between "old" and "new" Tiptronic strategy.

- ♦ "New" Tiptronic strategy means: On shifting selector lever to Tiptronic gate, gearbox automatically shifts up or down before speed governing limit is reached so that engine is always operating between idling and breakaway speed. Shiftdown is also automatically implemented if accelerator is depressed as far as kick-down.
- ♦ "Old" Tiptronic strategy means: On shifting selector lever to Tiptronic gate, gearbox only shifts up or down if selector lever is moved to front (+) or to rear (-). If vehicle is braked to a standstill, first gear is automatically activated for driving off.

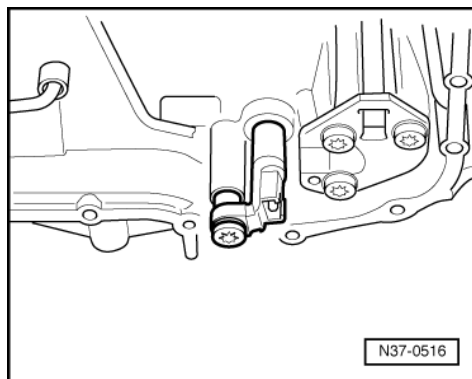


- If faults occur, check Tiptronic switch in measured value block
=> Page **123** for malfunctions.

-> In the event of faults, start by checking whether magnet is properly attached to transverse slide -C- of masking panel and replace masking panel if necessary. Symbol panel with integrated printed circuit board is not to be replaced before checking wiring. On vehicles with Tiptronic sports steering wheel, the buttons on the steering wheel and their wiring must also be checked.

Removing and installing Tiptronic switch -F189

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism

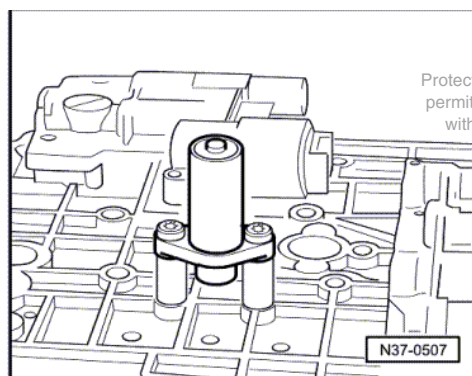


-> Fig.10 Gearbox speed sender -G38

Fitting location: Gearbox speed sender is located in gearbox at rear right. It is also referred to as gearbox output speed sender -G195.

Removing and installing gearbox speed sender

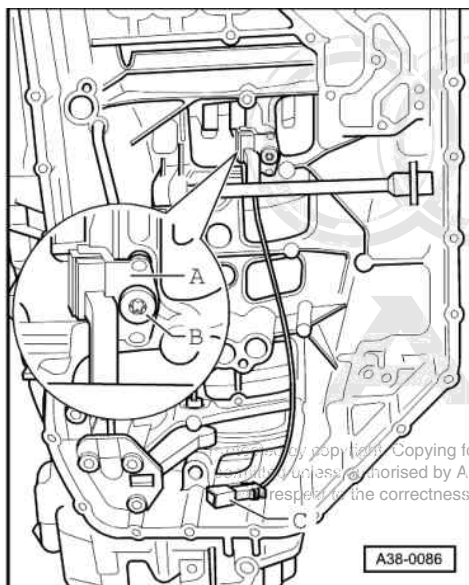
=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing valve body; Replacing gearbox speed sender -G38 Removing and installing valve body Replacing gearbox speed sender -G38



-> Fig.11 Gearbox input speed sender -G182

Fitting location:

On gearboxes with hydraulic control E17, gearbox input speed sender is located on underside of valve body (see Fig.). On such gearboxes the sender takes the form of an inductive pickup.



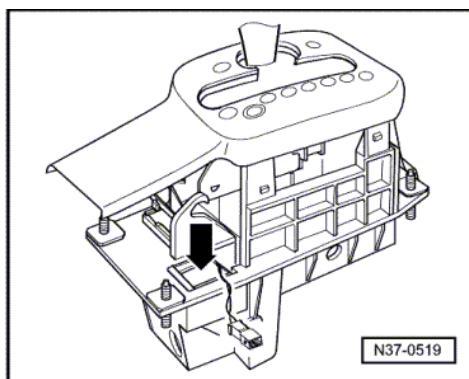
-> On gearboxes with hydraulic control as of E18/2, gearbox input speed sender -A- is attached behind valve body to gearbox housing. On such gearboxes the sender takes the form of a Hall sender.

Information as to which gearbox is concerned can be found in the following Workshop Manual in the Repair Group given:

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features
Code letters, assignment of mechanical units, transmission ratios, features

Removing and installing gearbox input speed sender

=> Automatic Gearbox 01V Front and Four-wheel Drive; 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

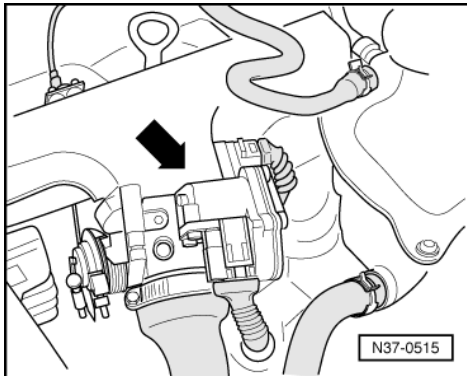


-> Fig.12 Selector lever lock solenoid -N110

Fitting location: Selector lever lock solenoid is located in shift mechanism -arrow-.

Removing and installing selector lever lock solenoid

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism



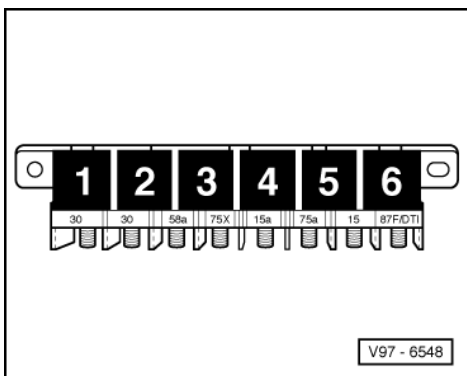
-> Fig.13 Throttle valve potentiometer -G69

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

Fitting location is described in the corresponding engine Workshop Manual in Repair Groups 01, 23 or 24.

Note:

On TDI engines and engines with electronic throttle, the accelerator position sender (-G79, -G185) assumes the function of the throttle valve potentiometer.

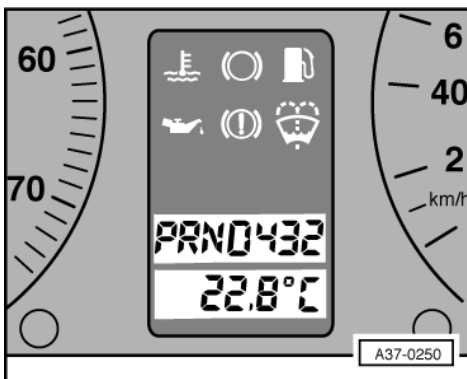


-> Fig.14 Starter inhibitor relay -J207

Fitting location: Relay is located in central electrics.

Assignment

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



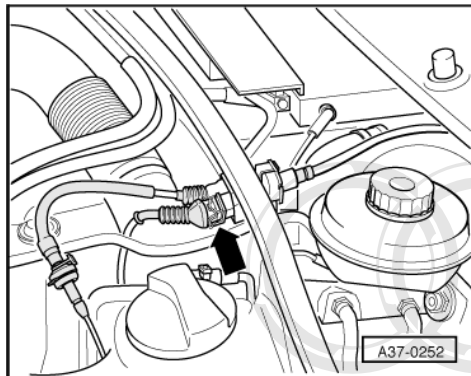
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-> Fig.15 Selector lever position indicator -Y6

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 (petrol engines with no electronic throttle):

Behind bulkhead in plenum chamber, integrated into throttle cable
-arrow-

Fitting location (TDI engines and engines with electronic throttle):

Kickdown switch is integrated into accelerator position sender (-G79, -G185).

If accelerator position sender (-G79, -G185) is removed, engine control unit replaced or battery disconnected, adaption must be performed for switching point of kickdown switch on TDI engines and engines with electronic throttle.

For adaption procedure, refer to the corresponding Workshop Manual

=> Fuel Supply System - Petrol Engines; Repair Group 20

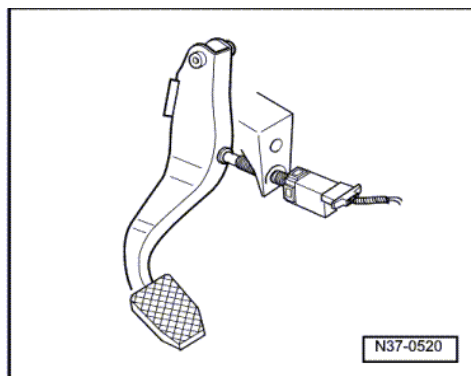
=> Fuel Supply System - Diesel Engines; Repair Group 20

Removing and installing kickdown switch

- Removing and installing kickdown switch involves removing, installing and subsequently adjusting throttle cable or replacing accelerator position sender (-G79, -G185).

=> Fuel Supply System - Petrol Engines; Repair Group 20; Servicing Accelerator Mechanism - Front and four-wheel drive Servicing Accelerator Mechanism - Front and four-wheel drive

=> Fuel Supply System - Diesel Engines; Repair Group 20; Servicing Accelerator Mechanism - Front and four-wheel drive Servicing Accelerator Mechanism - Front and four-wheel drive



-> Fig.17 Brake light switch -F

Fitting location: Brake light switch (arrow) is located at 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 via 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

Attention:

When towing, selector lever must be set to position N and vehicle is not to be driven for more than 50 km or at a speed in excess of 50 km/h as otherwise gearbox would be destroyed.

Note:

It is not possible to start the engine by means of start-towing, for instance in the case of insufficient battery charge or if starter is not working.

4 - Performing self-diagnosis

4.1 - Performing self-diagnosis

Additional information material required

- ◆ Workshop Manual Audi A4 1995 ä, Automatic Gearbox 01V Front and Four-wheel Drive
- ◆ Binder: "Current Flow Diagrams, Electrical Fault-finding and Fitting Locations"
- ◆ Technical Service Handbook
- ◆ Parts List

4.2 - Safety precautions

Pay attention to the following if testers and measuring instruments have to be used in the course of a test drive:

Attention:

- ◆ Always attach testers and measuring instruments to back seat and have them operated from there by a second person.
- ◆ If testers and measuring instruments were to be operated from front passenger's seat, person sitting there could suffer injury in the event of an accident due to triggering of front passenger's airbag.



Heed the following so as to avoid possible injury and/or the destruction of electrical and electronic components:

- ♦ Switch off ignition before disconnecting and connecting measuring instruments and testers.
- ♦ Certain tests may lead to a fault being detected by the control unit and stored. The fault memory is therefore to be interrogated and if necessary erased on completion of all tests and repair work.
- ♦ Always switch off ignition before disconnecting and connecting battery so as not to damage gearbox control unit.

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

Test requirements

- Selector lever set to "P" and handbrake applied
- Vehicle supply voltage OK
- Voltage supply and fuses for appropriate system OK

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

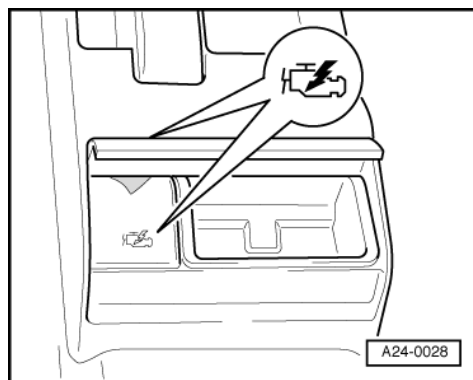
- Earth connections and earth point for gearbox OK

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

- Check earth connections for corrosion and damage and repair if necessary.
- Check battery earth strap and earth strap between battery and gearbox.

Sequence of operations

- Switch off ignition.

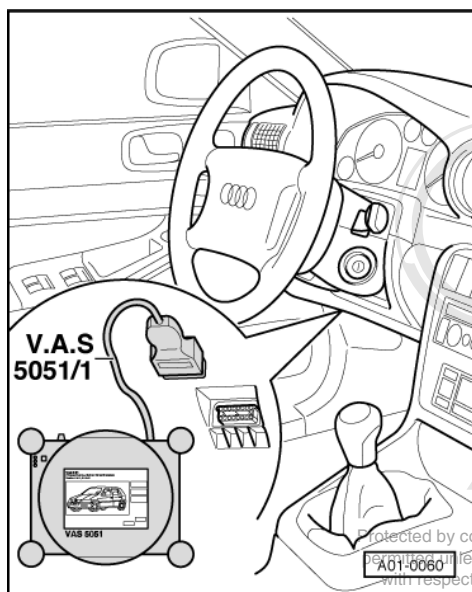


For vehicles up to Model Year 2000

-> Diagnosis connection is located beneath cover in rear ashtray (centre console) for vehicles up to Model Year 2000.

- Open rear ashtray (rear centre console) and remove cover for diagnosis connection.

For vehicles as of Model Year 2000



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-> As of Model Year 2000 diagnosis connection is located beneath knee restraint to the left of the steering wheel.

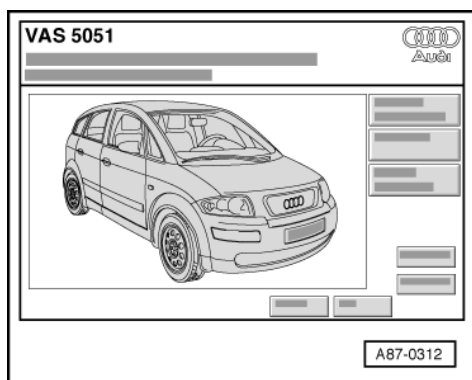
For all vehicles:

- -> Use diagnostic wire VAS 5051/1 to connect up vehicle diagnostic, testing and information system VAS 5051.

Attention:

- ◆ If measurements/tests have to be performed whilst driving, vehicle diagnostic, testing and information system VAS 5051 or fault reader V.A.G 1551 is always to be attached to rear seat and operated from there.
- ◆ Heed safety precautions => Page **21**.

Note:



If fault message appears on display:

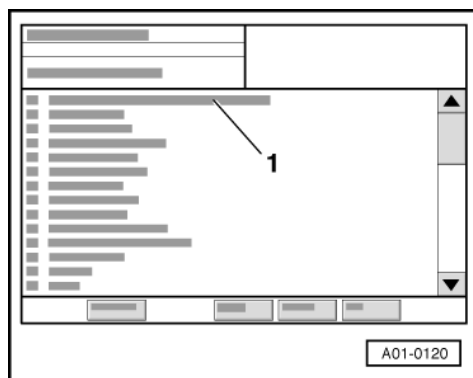
=> Operating instructions for vehicle diagnostic, testing and information system VAS 5051

- Switch on ignition.



-> Display on VAS 5051:

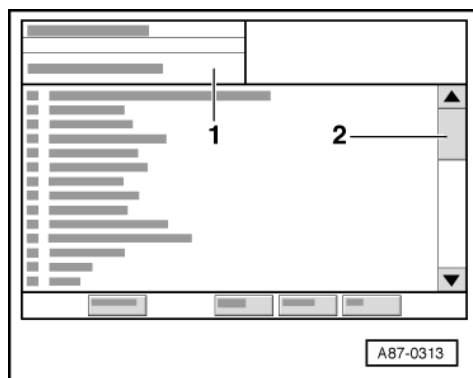
- Touch "Vehicle self-diagnosis" key.



-> Display on VAS 5051:

Note:

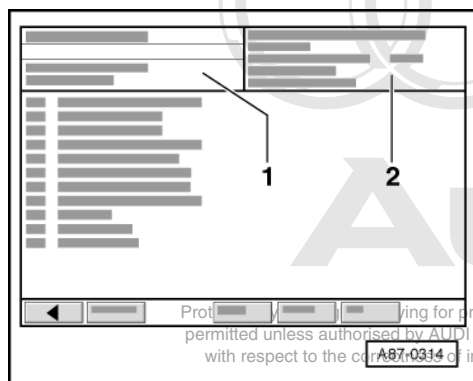
Touching "00 - Interrogating fault memory - entire system" in list -1- implements the automatic test sequence, i.e. fault memory interrogation takes place for all vehicle systems with self-diagnosis capability.



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

Notes:

- ♦ Vehicle system selection prompt appears in display zone -1-.
- ♦ Vehicle systems (for all vehicle models and equipment versions) can be viewed by "scrolling" the display with the moving bar -2-.
- Wait until next display appears.



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-> Display on VAS 5051:

2 - Gearbox control unit identification => Page 25

Check the following if "Vehicle system not available" appears in zone -1- of VAS 5051 display:

- Power supply to diagnosis connection on the basis of the current flow diagram.
- Wiring from diagnosis connection to control unit

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

- Control-unit supply voltage, Test step 1 => Page 123 , Electrical check.

Gearbox control unit identification (example)	
02 - Gearbox electronics	Vehicle system
4B0927156BT	Part No.; Assignment => Parts List
AG5 01V1)2.8I5V2)ROW3)14164)	1) Automatic gearbox, 5-speed 01V 2) Engine version: 6-cyl. 2.8l / 5 valve 3) Market, rest of world 4) Data level (software version) of control unit
Code 1	Control unit code => Page 80
Dealership number 12345	Workshop code of VAS 5051 with which encoding was last performed



- -> Selection can now be made from the following list of diagnosis functions -1-:

4.4 - List of available functions

All other diagnosis functions displayed can either not be selected or can be ignored in this case.

Diagnosis functions	Page
02 Interrogating fault memory	26
03 Final control diagnosis	70
05 Erasing fault memory	78
06 End of output	80
07 Encoding control unit	80
08 Reading measured value block	84

5 - Interrogating fault memory

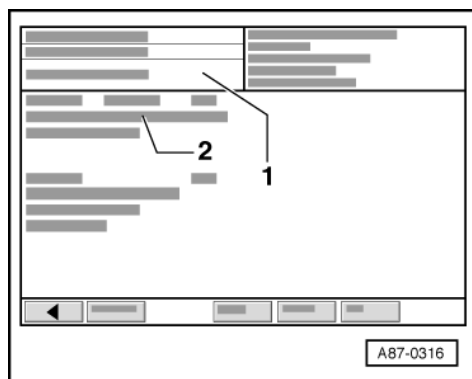
5.1 - Interrogating fault memory



- Connect up vehicle diagnostic, testing and information system VAS 5051 => Page 22 and select vehicle system "02 - Gearbox electronics". Ignition must be on.

-> Display on VAS 5051:

- From list -1- select diagnosis function "02 - Interrogating fault memory".



-> Display on VAS 5051:

- 1 - Content of fault memory:
 - 0 faults detected
 - or
 - X faults detected
- 2 - Fault
 - Fault code
 - Fault location
 - Type of fault

A - Faults detected:

- Print out information on screen or self-diagnosis log.
- Terminate function "02 - Interrogating fault memory" by touching key.



-> Display on VAS 5051:

- Following display and print-out of last fault, eliminate faults as per fault table => Page **27** onwards.
- Select diagnosis function "02 - Interrogating fault memory" again in list -1- and erase fault memory => Page **78**.
- From list -1- select diagnosis function "06 - End of output" => Page **80**.

B - No fault detected:

- Terminate function "02 - Interrogating fault memory" by touching **◀** key.
- Select diagnosis function "06 - End of output" in list => Page **80**.

6 - Fault table

6.1 - Fault table

6.2 - Important:

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- ◆ Listed in the following are all possible faults which are detected by the automatic gearbox control unit -J217 and displayed on VAS 5051 during fault memory interrogation.
- ◆ The fault table is arranged according to the 5-digit fault codes on the left.
- ◆ The content of the fault memory is retained until it is next erased, Erasing fault memory => Page **78**.
- ◆ If faults only occur intermittently or if fault memory is not erased after fault elimination, such faults are displayed for a specified period as being "sporadic faults" => Gearbox control unit fault recognition, Page **1**.
- ◆ Do not immediately replace components indicated as being defective by VAS 5051, but rather: Start by checking wiring and connectors to these components in line with current flow diagram. Also use current flow diagram to check earth connections. This is particularly important if faults are output as being "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

Display on VAS 5051	
No faults detected	Self-diagnosis is over if "No faults detected" appears on completion of repair work. Perform the following if there are gearshift problems with the automatic gearbox despite the fact that self-diagnosis has not revealed any faults: Final control diagnosis => Page 84

Display on VAS 5051	Possible cause of trouble	Fault remedy
00258 P0753 Solenoid 1 -N88 Open circuit/short to earth 1) Short to positive 1)	Open circuit in wiring or short to earth/positive Solenoid valve 1 -N88 defective	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 , Display Group Number 005 3) - Perform final control diagnosis =>Page 123

- 1) One of these displays will appear in addition to the component concerned.
- 2) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Note on fault recognition for fault code 00258 / P0753:

- ♦ Check for short to positive is made on switching on ignition. All types of fault are recognised when engine is running.

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Display on VAS 5051	Possible cause of trouble	Fault remedy
00260 P0758 Solenoid 2 -N89 Open circuit/short to earth 1) Short to positive 1)	Open circuit in wiring or short to earth/positive Solenoid valve 2 -N89 defective	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 , Display Group Number 005 3) - Perform final control diagnosis =>Page 123

- 1) One of these displays will appear in addition to the component concerned.
- 2) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Note on fault recognition for fault code 00260 / P0758:

- ♦ Check for short to positive is made on switching on ignition. All types of fault are recognised when engine is running.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00262 P0763 Solenoid 3 -N90 Open circuit/short to earth 1) Short to positive 1)	Open circuit in wiring or short to earth Solenoid valve 3 -N90 defective	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 , Display Group Number 005 3) - Perform final control diagnosis =>Page 123

- 1) One of these displays will appear in addition to the component concerned.
- 2) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Note on fault recognition for fault code 00262 / P0763:

- ◆ Check for short to positive is made on switching on ignition. All types of fault are recognised when engine is running.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00264 P1813 Solenoid 4 -N91 Open circuit/short to earth 1) Short to positive 1)	Open circuit in wiring or short to earth Solenoid valve 4 -N91 defective	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 , Display Group Number 006 3) - Perform final control diagnosis =>Page 123

- 1) One of these displays will appear in addition to the component concerned.
- 2) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
00266 P1818 Solenoid 5 -N92 Open circuit/short to earth 1) Short to positive 1)	Open circuit in wiring or short to earth Solenoid valve 5 -N92 defective	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 , Display Group Number 006 3) - Perform final control diagnosis =>Page 123
00268 P1823 Solenoid 6 -N93 Open circuit/short to earth 1) Short to positive 1)	Open circuit in wiring or short to earth Solenoid valve 6 -N93 defective	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 , Display Group Number 006 3) - Perform final control diagnosis =>Page 123



Refer to next page for notes and footnotes on fault codes 00266 / P1818 and 00268 / P1823.

- 1) One of these displays will appear in addition to the component concerned.
- 2) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
00270 P1828 Solenoid 7 -N94 Open circuit/short to earth 1) Short to positive 1)	Open circuit in wiring or short to earth Solenoid valve 7 -N94 defective	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 , Display Group Number 007 3) - Perform final control diagnosis =>Page 123

- 1) One of these displays will appear in addition to the component concerned.
- 2) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
00293 P0705 Multi-function switch -F125 Implausible signal	Open circuit in wiring or short to earth/positive Open circuit in power supply of multi-function switch Multi-function switch -F125 defective Multi-function switch connector not attached	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 004 2) - Perform Electrical Check =>Page 123 Replace multi-function switch -F125 if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Replacing multi-function switch -F125 Replacing multi-function switch -F125

- 1) Start by checking 8-pin connectors for contact corrosion/ingress of water and replace if necessary.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

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Display on VAS 5051	Possible cause of trouble	Fault remedy
00296 P1704 Kick-down switch -F8	Short to earth between -F8 and gearbox control unit Open circuit in wiring between -F8 and gearbox control unit	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 84 , Display Group Number 008 1)

Short to earth	Kick-down switch -F8 defective	- Perform Electrical Check =>Page 123 Adjust/replace accelerator cable => Fuel Supply System - Petrol Engines; Repair Group 20; Servicing Accelerator Mechanism - Front and four-wheel drive Servicing Accelerator Mechanism - Front and four-wheel drive
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1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 00296 / P1704:

- ♦ Fault detection conditions: Throttle valve signal OK, throttle valve value less than 25 % and short to earth in kickdown input at gearbox control unit (corresponds to kickdown signal).
- ♦ Short to positive between kickdown switch -F8 and gearbox control unit cannot be detected by self-diagnosis.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00297 P0722 Gearbox speed sender -G38	Open circuit in wiring or short to earth/ positive Screen for -G38 defective Gearbox speed sender -G38 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 123 Replace gearbox speed sender -G38 if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Replacing gearbox speed sender -G38 Replacing gearbox speed sender -G38
No signal	Incorrect engine/gearbox input speed signal	- Perform fault rectification as per fault code 00529, 17101
	ATF level not OK Defective or incorrect torque converter Continued ▼	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF Checking/ changing ATF Check torque converter identification

1) Start by checking connectors for contact corrosion/ingress of water and replace if necessary.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00297 P0722 Gearbox speed sender -G38 No signal	(Fault 00297 continued) Slipping of clutch/brakes or solenoid valve defective	Read measured value block, display group numbers 004 to 006 1) =>Page 84 and, whilst driving, establish which elements are defective/not activated

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Note on fault recognition for fault code 00297 / P0722:

- ♦ Fault recognition additionally includes a plausibility check: Ratio of gearbox output speed to engine and gearbox input speeds with gear engaged is implausible (test requirement: a definite gear must be engaged, i.e. not P, N or intermediate settings and gearshift operation must have been completed).

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Display on VAS 5051	Possible cause of trouble	Fault remedy
00300 P0712 Gearbox oil temperature sender -G93 Short to earth 1)	Open circuit in wiring/short circuit	- Use current flow diagram to check wiring and connectors 3) Read measured value block =>Page 84, Display Group Number 004 4)



Display on VAS 5051	Possible cause of trouble	Fault remedy
00300 P0713 Gearbox oil temperature sender -G93 Open circuit/short to positive2)	Gearbox oil temperature sender -G93 defective ATF level not OK 2)	- Perform Electrical Check =>Page 123 Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF Gearbox oil temperature sender - G93 is integrated into internal gearbox wiring harness

- 1) Additional fault detection: If ATF temperature detected is less than - 50 °C.
- 2) Additional fault detection: If ATF temperature detected exceeds 180 °C.
- 3) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults are displayed.
- 4) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

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

Display on VAS 5051	Possible cause of trouble	Fault remedy
00518 P0121 Throttle valve potentiometer -G69	Fault in throttle valve potentiometer -G69 diagnosed by engine control unit Fault in wiring between throttle valve potentiometer and engine control unit	- Read measured value block =>Page 84, Display Group Numbers 008 and 009 1) Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
Implausible signal	Incorrect or defective engine control unit Incorrect or defective gearbox control unit	- Check identification of engine control unit=> Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary - Check identification of gearbox control unit =>Page 25

Refer to next page for notes and footnotes on fault code 00518 / P0121 (for vehicles with CAN bus).

- 1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features
Code letters, assignment of mechanical units, transmission ratios, features

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

- ♦ Signal from throttle valve potentiometer -G69 is transmitted from engine control unit via CAN bus wire to gearbox control unit.
- ♦ Fault detection conditions: Fault in component concerned is diagnosed by engine control unit. This fault diagnosis is transmitted via CAN bus wire to gearbox control unit.
- ♦ 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) (with CAN bus => refer to previous fault):

Display on VAS 5051	Possible cause of trouble	Fault remedy
00518 P0121 Throttle valve potentiometer -G69 Signal too low 1) Signal too high 1) Implausible signal 1) 2)	Loose contact or short circuit between engine and gearbox control units	- If fault 00638 is also displayed, this is to be rectified first Use current flow diagram to check wiring and connectors Read measured value block =>Page 84 , Display Group Numbers 008 and 009 3)
	Fault in wiring between throttle valve potentiometer -G69 and engine control unit Throttle valve potentiometer -G69 defective No/incorrect signal being output by engine control unit	- Rectify fault as per fault codes 16504, 16505, 16506 and 16507 of engine control unit - Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis

Refer to next page for notes and footnotes on fault code 00518 / P0121 (for vehicles with no CAN bus).

- 1) One of these displays will appear in addition to the component concerned.
- 2) Only "implausible signal" fault exists for vehicles with Motronic injection and ignition systems.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

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

- ♦ Signal is transmitted from throttle valve potentiometer -G69 via engine control unit to gearbox control unit (as digital signal).
- ♦ Fault detection for fault code 00518 / P0121 is much more sensitive with gearbox control unit than with engine control unit. This means that a brief interruption (up to 1 s) in the throttle valve signal is not detected by the engine control unit but is diagnosed as a fault by the gearbox control unit.
- ♦ Fault detection conditions: Frequency of digital signal to gearbox control unit outside permissible tolerance (signal step change must take place at least every 30 ms).
- ♦ Fault code 00518 / P0121 for vehicles with CAN bus => refer to previous fault.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00526 P0703 Brake light switch -F Implausible signal	Brake light switch -F defective Open circuit in wiring or short to earth/positive between gearbox control unit and brake light switch -F	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 123 - Replace brake light switch -F if necessary

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Notes on fault code 00526 / P0703:

- ♦ Fault is preset on switching on ignition and is erased after pressing brake pedal once if brake light switch - F is OK.



- ♦ Press brake pedal briefly before interrogating fault memory to erase the preset fault.

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

Display on VAS 5051	Possible cause of trouble	Fault remedy
00529 P0727	Fault in engine speed sender -G28 diagnosed by engine control unit	- Read measured value block =>Page 84 , Display Group Number 001 1) Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
Speed information missing (engine speed)	Incorrect or defective engine control unit	- Check identification of engine control unit => 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 identification of gearbox control unit =>Page 25

Refer to next page for notes and footnotes on fault code 00529 / P0727 (for vehicles with CAN bus).

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

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

- ♦ Engine speed signal is transmitted from engine control unit via CAN bus wire to gearbox control unit.
- ♦ Fault detection conditions: Fault in component concerned is diagnosed by engine control unit. This fault diagnosis is transmitted via CAN bus wire to gearbox control unit.

Fault code 00529 / P0727 for vehicles with no CAN bus A) (with CAN bus => refer to previous fault):

Display on VAS 5051	Possible cause of trouble	Fault remedy
00529 P0727	Open circuit in wiring from engine to gearbox control units	- Use current flow diagram to check wiring and connectors
Speed information missing (engine speed)	Engine speed signal being biased by incorrectly laid wiring (e.g. service installation of telephone)	- Read measured value block =>Page 123
Open circuit/short to earth1) Short to positive1) Implausible signal1)	Fault in signal from engine speed sender to engine control unit Engine speed sender -G28 defective Engine control unit defective Short to earth/positive Short circuit in on-board computer	- Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis

Refer to next page for notes and footnotes on fault code 00529 / P0727 (for vehicles with no CAN bus).

- 1) One of these displays will appear in addition to the component concerned.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

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

- ◆ Fault detection for fault code 00529 / P0727 is much more sensitive with gearbox control unit than with engine control unit. This means that a brief interruption (up to 1 s) in the engine speed signal is not detected by the engine control unit but is diagnosed as a fault by the gearbox control unit.
- ◆ Fault detection for fault code 00529 / P0727 is based on a plausibility check with respect to the fuel consumption signal (or, if this is not applicable, to the throttle valve value).
- ◆ Fault detection conditions: Multi-function switch -F125 OK, fuel consumption signal or throttle valve signal OK, value detected for gearbox speed above 200 rpm and no engine speed signal applied to gearbox control unit for 200 ms.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00532 P1746 Supply voltage (control unit, solenoid valves) Signal too low ¹⁾ 2) Output not switched/short to earth ¹⁾ Output not switched/short to positive ¹⁾	Electrical system voltage less than 9 V Fuse defective Supply voltage for solenoid valves or gearbox control unit (terminal 15) less than 9 V or above 16 V Supply voltage applied even with ignition off, i.e. short to positive Open circuit in wiring or short circuit in contacts 52, 53, 54 or 55 of control unit -J217	- Check and if necessary service electrical system - Read measured value block =>Page 84 , Display Group Number 003 3) Check supply voltage to automatic gearbox control unit -J217 Use current flow diagram to check wiring and connectors - Perform Electrical Check =>Page 123

- 1) One of these displays will appear in addition to the component concerned.
- 2) Fault detection requirement: Engine speed above 1600 rpm
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
00543 P0726 Maximum revs exceeded ²⁾ (engine speed)	Open circuit in wiring Engine speed signal being biased by incorrectly laid wiring (e.g. service installation of telephone) Fault in signal from engine speed sender to engine control unit Engine speed sender -G28 defective	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 84 , Display Group Number 001 1) Fault rectification as per fault code 16706 of engine control unit



	Engine speed governing defective Engine control unit defective Continued ▼	- Read out engine control unit fault memory and eliminate faults => 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 type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

2) For notes on and requirements for fault detection, refer to fault code 00529/ P0727 (speed information missing).

Display on VAS 5051	Possible cause of trouble	Fault remedy
00543 P0726 Maximum revs exceeded2) (engine speed)	(Fault 00543 continued) Impermissible change-down by gearbox (e.g due to mechanical fault in valve body)	Read measured value block, Display Group Number 005 1) =>Page 84 and, whilst driving, establish which elements are defective/not activated Replace individual solenoid valves or valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body Removing and installing sump, ATF screen and valve body

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

2) For notes on and requirements for fault detection, refer to fault code 00529/ P0727 (speed information missing).

Display on VAS 5051	Possible cause of trouble	Fault remedy
00545 P0702 Engine/gearbox electrical connection (ignition adjustment) Connector	Open circuit in wiring or short circuit	- Use current flow diagram to check wiring and connectors
00545 P1781 Engine/gearbox electrical connection (ignition adjustment) Open circuit/short to earth	No engine/gearbox control unit connection with pin 20	- Read measured value block =>Page 84, Display Group Number 004 1)
00545 P1782 Engine/gearbox electrical connection (ignition adjustment) Short to positive	Ignition switched on with connector of engine control unit unplugged Engine control unit defective	- Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary

Refer to next page for notes and footnotes on fault code 00545 / P0702.

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

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

- ♦ Test requirement: Gearbox control unit not detecting throttle valve and fuel consumption signals. Detected gearbox input speed greater than 2000 rpm.

- ♦ This fault can only occur on vehicle models with no CAN bus A)

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Display on VAS 5051	Possible cause of trouble	Fault remedy
00549 Consumption signal Short to earth 1) Open circuit/short to positive1) Implausible signal1) 2)	Loose contact in wiring between engine and gearbox control units Short circuit in on-board computer Open circuit in wiring or short to earth/positive between engine and gearbox control units (to pin 35) Short circuit in wiring between engine control unit and on-board computer Engine control unit defective	- Use current flow diagram to check wiring and connectors Check on-board computer - Read measured value block =>Page 123 - Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary

- 1) One of these displays will appear in addition to the component concerned.
- 2) Fault detection condition: Engine speed and throttle valve signals OK and no consumption signal detected by gearbox control unit for 200 ms.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Refer to next page for notes on fault code 00549.

Notes on fault code 00549:

- ♦ This fault can only occur on vehicle models with no CAN bus A)

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Display on VAS 5051	Possible cause of trouble	Fault remedy
00638 P0702 Engine/gearbox electrical connection 2 Open circuit/short to positive	Open circuit in wiring or short to positive Short to earth No engine/gearbox control unit connection (with pin 41)	- Use current flow diagram to check wiring and connectors Read measured value block =>Page 84 , Display Group Number 009 1)
00638 P1767 Engine/gearbox electrical connection 2 Short to earth	Throttle valve signal not being transmitted to gearbox control unit	- Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary



Display on VAS 5051	Possible cause of trouble	Fault remedy
	Connector unplugged	- Perform Electrical Check =>Page 123

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

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

- ♦ This fault can only occur on vehicle models with no CAN bus A)

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

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

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

Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0732	Fault in engine, gearbox input or gearbox speeds	- Perform fault rectification as per fault codes 17116 / P0732, 00529 / P0727 or 00297 / P0722
Gear monitoring	ATF level not OK Defective or incorrect torque converter	- Check and top up ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/ changing ATF Check torque converter identification
Implausible signal	Slipping of clutch or brakes Valve body or solenoid valves defective Continued ▼	- Read measured value block, Display Group Number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body Removing and installing sump, ATF screen and valve body

Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0732 Gear monitoring	(Fault 00652 / P0732 continued) Incorrect gearbox or engine control unit fitted	Check identification of gearbox control unit =>Page 25 - Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary

Implausible signal	Possibly incorrect gearbox fitted (gearbox code does not match engine version)	- Check gearbox code => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features
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1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault recognition for fault code 00652 / P0732:

- ♦ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged is implausible (fault detection requirement: gearbox input speed and gearbox speed greater than 64 rpm and engine speed greater than 1400 rpm).
- ♦ Implausibility of 2nd gear ratio detected by gearbox control unit.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0733	Fault in engine, gearbox input or gearbox speeds	- Perform fault rectification as per fault codes 17117 / P0733, 00529 / P0727 or 00297 / P0722
Gear monitoring	ATF level not OK Defective or incorrect torque converter	- Check and top up ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/ changing ATF Check torque converter identification
Implausible signal	Slipping of clutch or brakes Valve body or solenoid valves defective Continued ▼	- Read measured value block, display group number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body Removing and installing sump, ATF screen and valve body

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Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0733 Gear monitoring	(Fault 00652 / P0733 continued) Incorrect gearbox or engine control unit fitted	Check identification of gearbox control unit =>Page 25 - Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Possibly incorrect gearbox fitted (gearbox code does not match engine version)	- Check gearbox code => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault recognition for fault code 00652 / P0733:

- ♦ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged is implausible (fault detection requirement: gearbox input speed and gearbox speed greater than 64 rpm and engine speed greater than 1400 rpm).



- ◆ Implausibility of 3rd gear ratio detected by gearbox control unit.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0734	Fault in engine, gearbox input or gearbox speeds	- Perform fault rectification as per fault codes 17118 / P0734, 00529 / P0727 or 00297 / P0722
Gear monitoring	ATF level not OK Defective or incorrect torque converter	- Check and top up ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/ changing ATF Checking/changing ATF Check torque converter identification
Implausible signal	Slipping of clutch or brakes Valve body or solenoid valves defective Continued ▼	- Read measured value block, display group number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body Removing and installing sump, ATF screen and valve body

Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0734 Gear monitoring	(Fault 00652 / P0734 continued) Incorrect gearbox or engine control unit fitted	Check identification of gearbox control unit =>Page 25 - Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary
Implausible signal	Possibly incorrect gearbox fitted (gearbox code does not match engine version)	- Check gearbox code => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault recognition for fault code 00652 / P0734:

- ◆ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged is implausible (fault detection requirement: gearbox input speed and gearbox speed greater than 64 rpm and engine speed greater than 1400 rpm).
- ◆ Implausibility of 4th gear ratio detected by gearbox control unit.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0735	Fault in engine, gearbox input or gearbox speeds Multi-function switch defective	- Perform fault rectification as per fault codes 17119 / P0735, 00529 / P0727, 00297 / P0722 or 00293 / P0705
Gear monitoring	ATF level not OK Defective or incorrect torque converter	- Check and top up ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/ changing ATF Checking/changing ATF Check torque converter identification

Implausible signal	Slipping of clutch or brakes Valve body or solenoid valves defective Continued ▼	- Read measured value block, display group number 007 1) =>Page 70 Replace valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body Removing and installing sump, ATF screen and valve body
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Display on VAS 5051	Possible cause of trouble	Fault remedy
00652 P0735 Gear monitoring Implausible signal	(Fault 00652 / P0735 continued) Incorrect gearbox or engine control unit fitted	Check identification of gearbox control unit =>Page 25 - Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Notes on fault recognition for fault code 00652 / P0735:

- ♦ Ratio of engine speed to gearbox input speed and gearbox speed with gear engaged is implausible (fault detection requirement: gearbox input speed and gearbox speed greater than 64 rpm and engine speed greater than 1400 rpm).
- ♦ Implausibility of 5th gear ratio detected by gearbox control unit.

Display on VAS 5051	Possible cause of trouble	Fault remedy
00668 P0560 Vehicle voltage terminal 30 Open circuit/short to earth	Open circuit in wiring or short to earth Fuse defective	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 84 , Display Group Number 003 1) - Perform Electrical Check =>Page 123

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Notes on fault code 00668 / P0560:

- ♦ Failure of electrical system voltage (terminal 30) results in loss of application values, i.e. gearbox control unit has to learn these values again on restarting. Gearshift quality may be poorer than usual during this "re-learning" process.
- ♦ Fault must be detected 5 times in succession after switching ignition off/on for fault to be set in self-diagnosis.

Display on VAS 5051	Possible cause of trouble	Fault remedy
01044 P1749 Control unit incorrectly coded	Gearbox control unit detects invalid code in EEPROM => Control unit defective	- Check identification of gearbox control unit =>Page 25

Display on VAS 5051	Possible cause of trouble	Fault remedy
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01192 P0741	ATF level not OK Defective or incorrect torque converter	- Check and top up ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF Check torque converter identification
Torque converter lock-up clutch	Mechanical fault in solenoid valve 7 -N94 Problems with ATF supply to solenoid valve 7 -N94 Incorrect control unit fitted	- Read measured value block =>Page 25
Excessive speed deviation	Fault in electrical actuation of solenoid valve 7 -N94	- Perform fault rectification as per fault code 00270 / P1828

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault recognition for fault code 01192 / P0741:

- ♦ Ratio of gearbox speed to gearbox input speed and engine speed with torque converter lock-up clutch engaged is implausible.

Display on VAS 5051	Possible cause of trouble	Fault remedy
01196 P1625	Ignition switched on with connector of automatic gearbox control unit -J217 unplugged	- Check connector of wire between engine and gearbox control units
Engine/gearbox - data bus	Open circuit in wiring or short circuit between engine and gearbox control units	- Perform Electrical Check =>Page 84, Display Group Numbers 008 and 009 1)
	Incorrect or defective engine control unit	- Check identification of engine control unit => 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 identification of gearbox control unit =>Page 3

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 01196 / P1625:

- ♦ This fault can only occur on vehicle models with CAN bus
- ♦ Function of CAN bus => Page 118

Display on VAS 5051	Possible cause of trouble	Fault remedy
01236 P1760	Fuse defective	- Use current flow diagram to check wiring and connectors
Selector lever lock solenoid -N110	Solenoid -N110 not being supplied with power	- Read measured value block =>Page 84, Display Group Number 003 2)

Open circuit/short to earth1) Short to positive1)	Open circuit in wiring or short to earth/positive	- Perform Electrical Check =>Page 123
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- 1) One of these displays will appear in addition to the component concerned.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
16987 P0603 Control unit defective	Automatic gearbox control unit -J217 defective	- Replace control unit => Page 3
16989 P0605 Control unit defective	Automatic gearbox control unit -J217 defective	- Replace control unit => Page 3
17086 P0702 Control unit defective	Automatic gearbox control unit -J217 defective	- Replace control unit => Page 3

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

Establish possible cause of trouble and eliminate the following faults:

- ♦ Mechanical faults
- ♦ Hydraulic faults
- ♦ Electr./electronic components and wiring

Display on VAS 5051	Possible cause of trouble	Fault remedy
17087 P0703 Brake light switch -F Electrical fault in current circuit	Implausible signal transmitted by engine control unit from brake light switch -F	- Read measured value block =>Page 84 , Display Group Number 003 1)
	Fault in wiring between brake light switch -F and engine control unit (open circuit or short to earth/positive)	- Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
	Brake light switch -F defective	- Use current flow diagram to check wiring and connectors Replace brake light switch -F if necessary => Fig. 21
	Incorrect or defective engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary
	Incorrect or defective gearbox control unit	- Check identification of gearbox control unit =>Page 25

Refer to next page for notes and footnotes on fault code 17087 / P0703.

- 1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Notes on fault code 17087 / P0703:

- ♦ Signal from brake light switch -F is transmitted from engine control unit via CAN bus wire to gearbox control unit.



- ♦ Fault detection conditions: Signals of brake light switch and brake test switch are transmitted via CAN bus wire to gearbox control unit where they are evaluated. This fault code is displayed in gearbox control unit in the event of implausibility.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17090 P0706 Driving range sensor => -F125 1) Implausible signal	Open circuit in wiring or short to earth/positive Open circuit in power supply of driving range sensor (multi-function switch) Driving range sensor (multi-function switch) -F125 defective Connector to driving range sensor (multi-function switch) -F125 not attached	- Use current flow diagram to check wiring and connectors 2) - Read measured value block =>Page 84 ; Display group number 004 3) - Perform Electrical Check =>Page 123 - Replace driving range sensor (multi-function switch) -F125 if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Replacing multi-function switch -F125 Replacing multi-function switch -F125

- 1) Driving range sensor -F125 is generally referred to as multi-function switch -F125.
- 2) Start by checking 8-pin connectors for contact corrosion/ingress of water and replace if necessary.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17094 P0710 Sensor for gearbox oil temp. -G93 Electrical fault in current circuit	Open circuit in wiring or short to earth/positive Gearbox oil temperature sender -G93 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 ; Display Group Number 004 3) - Perform Electrical Check =>Page 123 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox

- 1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults are displayed.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17095 P0711	Open circuit in wiring or short to earth/positive	- Use current flow diagram to check wiring and connectors 1)

Sensor for gearbox oil temp. -G93 Implausible signal	Gearbox oil temperature sender - G93 defective	- Read measured value block =>Page 84 ; Display Group Number 004 3) - Perform Electrical Check =>Page 123 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox
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Refer to next page for notes and footnotes on fault code 17095 / P0711.

- 1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults are displayed.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Note on fault code 17095 / P0711:

- ♦ **Fault detection condition:** Gearbox oil temperature does not increase or change abruptly after starting engine.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17096 P0712 Sensor for gearbox oil temp. -G93 Signal too low	Short to earth Gearbox oil temperature sender - G93 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 ; Display group number 004 3) - Perform Electrical Check =>Page 123 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox

- 1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults are displayed.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".



Display on VAS 5051	Possible cause of trouble	Fault remedy
17097 P0713 Sensor for gearbox oil temp. -G93 Signal too high	Open circuit in wiring or short to positive Gearbox oil temperature sender - G93 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 ; Display group number 004 3) - Perform Electrical Check =>Page 123 Replace gearbox oil temperature sender -G93 2) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox Removing and installing sump, ATF screen and valve body; Removing and installing wiring harness in gearbox

- 1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults are displayed.
- 2) Gearbox oil temperature sender -G93 is integrated into wiring harness in gearbox (at valve body).
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17100 P0716 Sensor for gear input speed -G182 Implausible signal Continued ▼	Open circuit in wiring or short to earth/positive Gearbox input speed sender - G182 defective Fault in gearbox speed signal	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 123 Replace gearbox input speed sender -G182 => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing gearbox input speed sender - G182 Removing and installing sump, ATF screen and valve body; Removing and installing gearbox input speed sender - G182 - Perform fault rectification as per fault code 17105 / P0721

Display on VAS 5051	Possible cause of trouble	Fault remedy
Continuation of fault 17100 P0716 Sensor for gear input speed -G182	ATF level not OK Defective or incorrect torque converter	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF Checking/changing ATF Check torque converter identification

Implausible signal	Slipping of clutches or brakes	- Read measured value block, Display group numbers 005 2) to 007 2) =>Page 84 and, whilst driving, establish which elements are defective/not activated
	Solenoid valve or pressure control valve sticking	- Perform final control diagnosis Replace solenoid valves, pressure control valves or valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing valve body Removing and installing sump, ATF screen and valve body; Removing and installing valve body

Refer to next page for notes and footnotes on fault code 17100 / P0716.

- 1) Start by checking connectors for contact corrosion/ingress of water and replace if necessary.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Note on fault code 17100 / P0716:

- ♦ Fault detection condition: Definite gear (D, 4, 3 or 2) engaged, not intermediate position. Engine speed whilst driving greater than 608 rpm. Gearbox output speed whilst driving greater than 416 rpm.
- ♦ Fault is displayed if fault detection conditions are fulfilled and gearbox input speed is equal to 0 rpm or greater than 8000 rpm.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17101 P0717 Sensor for gear input speed -G182	Open circuit in wiring or short to earth/positive Screen of wiring to sender - G182 defective Gearbox input speed sender - G182 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 123 Replace gearbox input speed sender if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing gearbox input speed sender -G182 Removing and installing sump, ATF screen and valve body; Removing and installing gearbox input speed sender -G182
No signal	Fault in engine speed, gearbox speed signal	- Perform fault rectification as per fault codes 00529, 00297, 17106, 17110 or 17090



	ATF level not OK Defective or incorrect torque converter Continued ▼	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking ATF level and topping up Checking ATF level and topping up Check torque converter identification
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- 1) Start by checking connectors for contact corrosion/ingress of water and replace if necessary.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17101 P0717 Sensor for gear input speed -G182	(Fault 17101 / P0717 continued) Slipping of clutches or brakes	Read measured value block, Display Group Numbers 005 2) to 007 2) =>Page 84 and, whilst driving, establish which elements are defective/not activated
No signal	Solenoid valve or pressure control valve sticking	- Perform final control diagnosis =>Page 70 Replace solenoid valves, pressure control valves or valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing valve body Removing and installing sump, ATF screen and valve body; Removing and installing valve body

- 1) Start by checking connectors for contact corrosion/ingress of water and replace if necessary.

- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Refer to next page for notes on fault code 17101 / P0717.

Note on fault recognition for fault code 17101 / P0717:

- ♦ Fault recognition additionally includes a plausibility check: Ratio of gearbox input speed to engine and gearbox output speeds with gear engaged is implausible (test requirement: a definite gear must be engaged, i.e. not P, N or intermediate settings and gearshift operation must have been completed).

Display on VAS 5051	Possible cause of trouble	Fault remedy
17105 P0721 Sensor for gear output speed -G195 2)	Open circuit in wiring or short to earth/positive Screen for -G195 defective Gearbox output speed sender -G195 2) defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 123 Replace gearbox output speed sender -G195 2) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing gearbox speed sender -G38 Removing and installing sump, ATF screen and valve body; Removing and installing gearbox speed sender -G38

Implausible signal Continued ▼	Incorrect engine/ gearbox input speed signal	- Perform fault rectification as per fault code 17100 / P0716 Continued ▼
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Display on VAS 5051	Possible cause of trouble	Fault remedy
Continuation of fault 17105 P0721 Sensor for gear output speed -G195	ATF level not OK Defective or incorrect torque converter	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF Checking/ changing ATF Check torque converter identification
Implausible signal	Slipping of clutch/brakes or sol- enoid valve defective	- Read measured value block=>Page 84 , Display group numbers 005 3) to 007 3) and, whilst driving, establish which elements are defective/not acti- vated

- 1) Start by checking connectors for contact corrosion/ingress of water and replace if necessary.
- 2) Gearbox output speed sender -G195 is also known as gearbox speed sender -G38.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17106 P0722 Sensor for gear output speed -G195 2) No signal	Open circuit in wiring or short to earth/ positive Screen for gearbox speed sender -G38 2) defective Gearbox speed sender -G38 2) defec- tive Protected by copyright. Copying for private or commercial use is not permitted unless authorised by AUDI AG. AUDI AG does not accept any liability with respect to the correctness of information in this document. Copyright by Audi AG.	- Use current flow diagram to check wir- ing and connectors 1) - Read measured value block =>Page 123 Replace gearbox speed sender -G38 if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing gearbox speed sender -G38 Removing and installing sump, ATF screen and valve body; Removing and installing gearbox speed sender -G38
	Incorrect engine/ gearbox input speed signal	- Perform fault rectification as per fault code 17100 / P0716
	ATF level not OK Defective or incorrect torque converter Continued ▼	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF Checking/ changing ATF Check torque converter identification

Display on VAS 5051	Possible cause of trouble	Fault remedy
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17106 P0722 Sensor for gear output speed -G195 2) No signal	(Fault 17106 / P0722 continued) Slipping of clutch/brakes or solenoid valve defective	Read measured value block=>Page 84 , Display Group Numbers 005 3) to 007 3) and, whilst driving, establish which elements are defective/not activated
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- 1) Start by checking connectors for contact corrosion/ingress of water and replace if necessary.
- 2) Gearbox output speed sender -G195 is also known as gearbox speed sender -G38.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

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Note on fault recognition for fault code 17106 / P0722:

- ♦ Fault recognition additionally includes a plausibility check: Ratio of gearbox output speed to engine and gearbox input speeds with gear engaged is implausible (test requirement: a definite gear must be engaged, i.e. not P, N or intermediate settings and gearshift operation must have been completed).

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

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

Display on VAS 5051	Possible cause of trouble	Fault remedy
17110 P0726	Fault in engine speed sender - G28 diagnosed by engine control unit Excessive engine speed detected (engine over-revved)	- Read measured value block =>Page 84 , Display Group Num- ber 001 1) Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Man- ual; Repair Group 01; Self-diagno- sis
Speed signal from engine control unit	Incorrect or defective engine con- trol unit	- Check identification of engine con- trol unit => Refer to Engine Workshop Man- ual; Repair Group 01; Self-diagno- sis Replace engine control unit if nec- essary
Implausible signal	Incorrect or defective gearbox control unit	- Check identification of gearbox control unit =>Page 25

- 1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Note on fault code 17110 / P0726:

- ♦ Engine speed signal is transmitted from engine control unit via CAN bus wire to gearbox control unit.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17114 P0730	ATF level not OK or ATF contaminated	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF Checking/chang- ing ATF
Gear/ratio monitoring	Clutch slipping/defective or solenoid valve dirty/defective	- Perform final control diagnosis =>Page 70

Wrong ratio	Open circuit in wiring or short to earth/positive	- Use current flow diagram to check wiring and connectors Perform Electrical Check =>Page 123
	Incorrect gearbox control unit fitted or wrongly encoded	- Check identification of gearbox control unit =>Page 25
	Gearbox input speed sender -G182 defective	- Perform fault rectification as per fault code 17100 / P0716 or 17101 / P0717
	Gearbox output speed sender -G195 defective	- Perform fault rectification as per fault code 17105 / P0721 or 17106 / P0722

Refer to next page for notes and footnotes on fault code 17114 / P0730.

Notes on fault recognition for fault code 17114 / P0730:

- ◆ Gearbox control-unit gear monitoring checks transmission ratios by comparing gearbox input and gearbox output speeds with allowance for gear engaged in each case. This fault is displayed if an impermissible gear ratio (implausibility) is detected.
- ◆ When testing stall speed, gearbox input speed in torque converter with vehicle stationary and gear engaged must be virtually zero. If this is not the case, this fault will also be displayed due to the possibility of clutch damage (Reading measured value block =>Page **84** ; Display group number 001).

Display on VAS 5051	Possible cause of trouble	Fault remedy
17115 P0731 1. Gear	Clutch for this gear slipping/defective or solenoid valve for this gear dirty/defective	- Perform final control diagnosis =>Page 70 Refer to clutch/solenoid valve logic => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout; Position of selector elements Transmission layout; Position of selector elements
Wrong ratio	Gearbox output speed sender -G195 defective	- Perform fault rectification as per fault code 17105 / P0721 or 17106 / P0722
	Gearbox input speed sender -G182 defective	- Perform fault rectification as per fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit fitted or wrongly encoded	- Check identification of gearbox control unit =>Page 25

Notes on fault recognition for fault code 17115 / P0731:

- ◆ Gearbox control-unit gear monitoring checks transmission ratios by comparing gearbox input and gearbox output speeds with allowance for gear engaged in each case. This fault is displayed if an impermissible gear ratio (implausibility) is detected.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17116 P0732 2. Gear	Clutch for this gear slipping/defective or solenoid valve for this gear dirty/defective	- Perform final control diagnosis =>Page 70 Refer to clutch/solenoid valve logic => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout; Position of selector elements Transmission layout; Position of selector elements
Wrong ratio	Gearbox output speed sender -G195 defective	- Perform fault rectification as per fault code 17105 / P0721 or 17106 / P0722
	Gearbox input speed sender -G182 defective	- Perform fault rectification as per fault code 17100 / P0716 or 17101 / P0717



	Incorrect gearbox control unit fitted or wrongly encoded	- Check identification of gearbox control unit =>Page 25
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Notes on fault recognition for fault code 17116 / P0732:

- ◆ Gearbox control-unit gear monitoring checks transmission ratios by comparing gearbox input and gearbox output speeds with allowance for gear engaged in each case. This fault is displayed if an impermissible gear ratio (implausibility) is detected.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17117 P0733 3. Gear	Clutch for this gear slipping/defective or solenoid valve for this gear dirty/defective	- Perform final control diagnosis =>Page 70 Refer to clutch/solenoid valve logic => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout; Position of selector elements Transmission layout; Position of selector elements
Wrong ratio	Gearbox output speed sender -G195 defective	- Perform fault rectification as per fault code 17105 / P0721 or 17106 / P0722
	Gearbox input speed sender -G182 defective	- Perform fault rectification as per fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit fitted or wrongly encoded	- Check identification of gearbox control unit =>Page 25

Notes on fault recognition for fault code 17117 / P0733:
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- ◆ Gearbox control-unit gear monitoring checks transmission ratios by comparing gearbox input and gearbox output speeds with allowance for gear engaged in each case. This fault is displayed if an impermissible gear ratio (implausibility) is detected.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17118 P0734 4. Gear	Clutch for this gear slipping/defective or solenoid valve for this gear dirty/defective	- Perform final control diagnosis =>Page 70 Refer to clutch/solenoid valve logic => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout; Position of selector elements Transmission layout; Position of selector elements
Wrong ratio	Gearbox output speed sender -G195 defective	- Perform fault rectification as per fault code 17105 / P0721 or 17106 / P0722
	Gearbox input speed sender -G182 defective	- Perform fault rectification as per fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit fitted or wrongly encoded	- Check identification of gearbox control unit =>Page 25

Notes on fault recognition for fault code 17118 / P0734:

- ◆ Gearbox control-unit gear monitoring checks transmission ratios by comparing gearbox input and gearbox output speeds with allowance for gear engaged in each case. This fault is displayed if an impermissible gear ratio (implausibility) is detected.

Display on VAS 5051	Possible cause of trouble	Fault remedy
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17119 P0735 5. Gear Wrong ratio	Clutch for this gear slipping/defective or solenoid valve for this gear dirty/defective	- Perform final control diagnosis =>Page 70 Refer to clutch/solenoid valve logic => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout; Position of selector elements Transmission layout; Position of selector elements
	Gearbox output speed sender -G195 defective	- Perform fault rectification as per fault code 17105 / P0721 or 17106 / P0722
	Gearbox input speed sender -G182 defective	- Perform fault rectification as per fault code 17100 / P0716 or 17101 / P0717
	Incorrect gearbox control unit fitted or wrongly encoded	- Check identification of gearbox control unit =>Page 25

Notes on fault recognition for fault code 17119 / P0735:

- ♦ Gearbox control-unit gear monitoring checks transmission ratios by comparing gearbox input and gearbox output speeds with allowance for gear engaged in each case. This fault is displayed if an impermissible gear ratio (implausibility) is detected.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17125 P0741 Lock-up clutch coupling No power transmission	ATF level not OK Defective or incorrect torque converter Mechanical fault in pressure control valve 4 -N218 1) Problems with ATF supply to pressure control valve 4 -N218 1) Torque converter pressure valve defective Torque converter clutch valve defective Continued ▼	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking ATF level and topping up Checking ATF level and topping up Check torque converter identification - Read measured value block =>Page 84 ; Display Group Number 007 2) and check torque converter clutch (engaged) as well as permissible torque converter slip Replace pressure control valve 4 -N218 or, if necessary, valve body => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing valve body Removing and installing sump, ATF screen and valve body; Removing and installing valve body

- 1) Pressure control valve 4 -N218 is also referred to as solenoid valve 7 -N94.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17125 P0741 Lock-up clutch coupling	(Fault 17125 / P0741 continued) Torque converter lock-up clutch defective, worn	Replace torque converter if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 32; Torque converter
No power transmission	Fault in electrical actuation of pressure control valve 4 -N218 1)	- Perform fault rectification as per fault code 18237 or 18238

- 1) Pressure control valve 4 -N218 is also referred to as solenoid valve 7 -N94.

**Notes on fault recognition for fault code 17125 / P0741:**

- ♦ Ratio of gearbox input speed (-G182) to engine speed with torque converter clutch engaged is not appropriate (implausible).

Display on VAS 5051	Possible cause of trouble	Fault remedy
17135 P0751 Switch valve 1=>Solenoid 1-N88 Open circuit/short to earth	Open circuit in wiring or short to earth Solenoid valve 1 -N88 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123
17136 P0752 Switch valve 1=>Solenoid 1-N88 Short to positive	Short to positive Solenoid valve 1 -N88 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123

Refer to next page for notes and footnotes on fault codes 17135 / P0751 and 17136 / P0752.

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault detection for fault codes 17135 / P0751 and 17136 / P0752

- ♦ Check for short to positive is made on switching on ignition. All types of fault are recognised when engine is running.

Display on VAS 5051	Possible cause of trouble	Fault remedy
17137 P0753 Switch valve 1=>Solenoid 1-N88 Electrical fault in current circuit	Open circuit in wiring or short to earth/positive Solenoid valve 1 -N88 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17140 P0756 Switch valve 2 =>Solenoid 2-N89 Open circuit/short to earth	Open circuit in wiring or short to earth Solenoid valve 2 -N89 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123

17141 P0757 Switch valve 2 =>Solenoid 2-N89 Short to positive	Short to positive Solenoid valve 2 -N89 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123
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Refer to next page for notes and footnotes on fault codes 17140 / P0756 and 17141 / P0757.

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17142 P0758 Switch valve 2=>Solenoid 2-N89 Electrical fault in current circuit	Open circuit in wiring or short to earth/positive Solenoid valve 2 -N89 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17145 P0761 Switch valve 3 =>Solenoid 3-N90 Open circuit/short to earth	Open circuit in wiring or short to earth Solenoid valve 3 -N90 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123
17146 P0762 Switch valve 3 =>Solenoid 3-N90 Short to positive	Short to positive Solenoid valve 3 -N90 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123

Refer to next page for notes and footnotes on fault codes 17145 / P0761 and 17146 / P0762.

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
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17147 P0763 Switch valve 3=>Solenoid 3-N90 Electrical fault in current circuit	Open circuit in wiring or short to earth/positive Solenoid valve 3 -N90 defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 005 2) - Perform final control diagnosis =>Page 123
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1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid valves are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
17968 P1560 Maximum engine revs surpassed	Fault in signal from engine speed sender to engine control unit Engine speed sender -G28 defective Engine speed signal being biased by incorrectly laid wiring (e.g. service installation of telephone)	- Read measured value block =>Page 84 ; Display Group Number 001 1) Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
	Impermissible change-down by gearbox (e.g due to mechanical fault in valve body)	- Read measured value block, Display group numbers 005 =>Page 84 and, whilst driving, establish which elements are defective/not activated Replace individual solenoid valves or valve body if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing sump, ATF screen and valve body; Removing and installing valve body Removing and installing sump, ATF screen and valve body; Removing and installing valve body

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Note on fault code 17968 / P1560:

- ♦ Fault detection condition: Engine speed greater than 7400 rpm

Display on VAS 5051	Possible cause of trouble	Fault remedy
18112 P1704 Kickdown switch -F8	Short to earth between -F8 and gearbox control unit Open circuit in wiring between -F8 and gearbox control unit	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 84 ; Display Group Number 008 2)

Electrical fault in current circuit	Kickdown switch -F8 1) defective	- Perform Electrical Check =>Page 20
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- 1) Kickdown switch -F8 is integrated into accelerator position sender -G79.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Notes on fault code 18112 / P1704:

- ♦ Fault detection conditions: Throttle valve signal OK, throttle valve value less than 25 % and short to earth in kickdown input at gearbox control unit (corresponds to kickdown signal) or short to positive; engine must be running.
- ♦ This fault may be erroneously displayed if brake pedal is pressed and accelerator is pressed as far as kickdown (full throttle) at the same time although kickdown switch is OK.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18141 P1733	Short to earth in Tiptronic switch -F189 1)	- Read measured value block =>Page 84 ; Display Group Number 011 4)
Tiptronic switch, back -F189	Short to earth in wiring	- Perform Electrical Check =>Page 123
Short to earth	Tiptronic switch -F189 2) defective Magnet in masking panel of shift mechanism has worked loose 3)	- Replace symbol panel 2) or masking panel 3) of shift mechanism => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism

Refer to next page for notes and footnotes on fault code 18141 / P1733.

- 1) When selector lever is in Tiptronic gate, manual change-down can be implemented by tapping selector lever to rear (-) or - on vehicles with Tiptronic sports steering wheel - by pressing one of the minus (-) buttons on the steering wheel (change-down position).
- 2) Tiptronic switch -F189 incorporates detection switch, change-up position and change-down position. It is permanently installed in the printed circuit board of the symbol panel, i.e. symbol panel must be replaced if Tiptronic switch -F189 is defective.
- 3) Tiptronic switch -F189 receives information on Tiptronic gate recognition and Tiptronic change-up/change-down by way of the large magnet attached to the transverse slide of the masking panel. Masking panel must be replaced if magnet has worked loose.
- 4) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Note on fault recognition for fault code 18141 / P1733:

- ♦ Fault is displayed if switching of change-down position 1) is detected in selector lever position other than D.
- ♦ This fault can only be displayed on vehicles with Tiptronic shift mechanism.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18147 P1739	Short to earth in Tiptronic switch -F189 1)	- Read measured value block =>Page 84 ; Display Group Number 011 4)
Tiptronic switch, up -F189	Short to earth in wiring	- Perform Electrical Check =>Page 123



Short to earth	Tiptronic switch -F189 2) defective Magnet in masking panel of shift mechanism has worked loose 3)	- Replace symbol panel 2) or masking panel 3) of shift mechanism => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism
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Refer to next page for notes and footnotes on fault code 18147 / P1739.

- 1) When selector lever is in Tiptronic gate, manual change-up can be implemented by tapping selector lever forwards (+) or -on vehicles with Tiptronic sports steering wheel - by pressing one of the plus (+) buttons on the steering wheel (change-up position).
- 2) Tiptronic switch -F189 incorporates detection switch, change-up position and change-down position. It is permanently installed in the printed circuit board of the symbol panel, i.e. symbol panel must be replaced if Tiptronic switch -F189 is defective.
- 3) Tiptronic switch -F189 receives information on Tiptronic gate recognition and Tiptronic change-up/change-down by way of the large magnet attached to the transverse slide of the masking panel. Masking panel must be replaced if magnet has worked loose.
- 4) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault recognition for fault code 18147 / P1739:

- ♦ Fault is displayed if switching of change-up position 1) is detected in selector lever position other than D.
- ♦ This fault can only be displayed on vehicles with Tiptronic shift mechanism.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18152 P1744	Short to earth in Tiptronic switch - F189 1)	- Read measured value block =>Page 84 ; Display Group Number 011 4)
Tiptronic switch, recognition -F189	Short to earth in wiring	- Perform Electrical Check =>Page 123
Short to earth	Tiptronic switch -F189 2) defective Magnet in masking panel of shift mechanism has worked loose 3)	- Replace symbol panel 2) or masking panel 3) of shift mechanism => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism

Refer to next page for notes and footnotes on fault code 18152 / P1744.

- 1) Shifting into Tiptronic gate in selector lever position D is recognised by the Tiptronic switch -F189 and transmitted to gearbox control unit.
- 2) Tiptronic switch -F189 incorporates detection switch, change-up position and change-down position. It is permanently installed in the printed circuit board of the symbol panel, i.e. symbol panel must be replaced if Tiptronic switch -F189 is defective.
- 3) Tiptronic switch -F189 receives information on Tiptronic gate recognition and Tiptronic change-up/change-down by way of the large magnet attached to the transverse slide of the masking panel. Masking panel must be replaced if magnet has worked loose.
- 4) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault recognition for fault code 18152 / P1744:

- ♦ Fault is displayed if Tiptronic is recognised although selector lever is not in Tiptronic gate.

- ♦ This fault can only be displayed on vehicles with Tiptronic shift mechanism.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18153 P1745	Short to positive in contacts 52, 53 of automatic gearbox control unit -J217	- Check supply voltage to control unit - J217 by reading measured value block =>Page 84 ; Display group number 003 2)
Supply voltage for solenoid	Automatic gearbox control unit -J217 defective	- Use current flow diagram to check wiring and connectors 1)
Short to positive		- Perform Electrical Check =>Page 3

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18155 P1747	Open circuit in wiring or short to earth in contacts 52, 53 of automatic gearbox control unit -J217	- Check supply voltage to control unit - J217 by reading measured value block =>Page 84 ; Display group number 003 2)
Supply voltage for solenoid	Automatic gearbox control unit -J217 defective	- Check supply voltage to control unit - J217
Open circuit/short to earth		Use current flow diagram to check wiring and connectors 1)
		- Perform Electrical Check =>Page 3

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults are displayed.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18156 P1748	Control unit defective	Automatic gearbox control unit -J217 defective
		- Replace control unit => Page 3

Notes on fault codes 18156 / P1748:

Establish possible cause of trouble and eliminate the following faults:

- ♦ Mechanical faults
- ♦ Hydraulic faults
- ♦ Electr./electronic components and wiring

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Display on VAS 5051	Possible cause of trouble	Fault remedy
18157 P1749	Control unit for automatic gearbox	Gearbox control unit detects invalid code
		- Check identification of gearbox control unit =>Page 3



Wrong coding	Engine control unit incorrectly encoded or incorrect engine control unit fitted	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary
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Display on VAS 5051	Possible cause of trouble	Fault remedy
18158 P1750	Open circuit in wiring or short to earth	- Use current flow diagram to check wiring and connectors
Voltage supply	Battery monitoring detects fault	- Check supply voltage to control unit -J217 - Read measured value block =>Page 84 ; Display Group Number 003 1)
Voltage too low	Open circuit/short to permanent positive in gearbox control unit	- Perform Electrical Check =>Page 3

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18158 / P1750:

- ♦ Fault detection condition: Battery voltage less than/equal to 9 V => Gearbox switches to emergency running mode => Page 1.
- ♦ Failure of electrical system voltage (terminal 30) results in loss of application values, i.e. gearbox control unit has to learn these values again on restarting. Gearshift quality may be poorer than usual during this "re-learning" process.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18159 P1751	Supply voltage for automatic gearbox control unit -J217 greater than 16 V	- Use current flow diagram to check wiring and connectors
Voltage supply	Voltage regulator -C1 for alternator defective	- Check supply voltage to control unit -J217 Read measured value block =>Page 123
Voltage too high	Second battery inadvertently connected in series e.g. on external starting	- Check and, if necessary, replace voltage regulator -C1 for alternator => Electrical System; Repair Group 27

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18159 / P1751:

- ♦ Fault detection condition: Battery voltage greater than 16 V.
- ♦ Battery monitoring makes a distinction between four ranges: (U = battery voltage) 1. U < 7 V => Gearbox switches to emergency running mode => Page 1

Display on VAS 5051	Possible cause of trouble	Fault remedy
18160 P1752	Supply voltage for automatic gearbox control unit -J217 subject to major fluctuations/interrupted	- Use current flow diagram to check wiring and connectors Check supply voltage to control unit -J217
Voltage supply	Voltage regulator -C1 for alternator defective	- Read measured value block =>Page 123

Implausible signal	- Check and, if necessary, replace voltage regulator -C1 for alternator => Electrical System; Repair Group 27
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1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18160 / P1752:

- ♦ Fault detection condition: Battery voltage less than/equal to 9 V => Gearbox switches to emergency running mode
=> Page 1.
- ♦ Failure of electrical system voltage (terminal 30) results in loss of application values, i.e. gearbox control unit has to learn these values again on restarting. Gearshift quality may be poorer than usual during this "re-learning" process.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18169 P1761 Select. lev. lock=>solenoid -N110 1) Short to earth	Short to earth 3) Solenoid -N110 not being supplied with power Fuse defective Selector lever lock solenoid -N110 defective	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 84, Display Group Number 003 4) - Perform Electrical Check =>Page 123 Replace selector lever lock solenoid -N110 if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism
	Short circuit on shift mechanism printed circuit board	- Replace shift mechanism symbol panel if necessary 2) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism
	Automatic gearbox control unit - J217 defective	- If necessary, replace control unit - J217 => Page 3

Refer to next page for notes and footnotes on fault code 18169 / P1761.

- Selector lever lock=>solenoid -N110 is also referred to as selector lever lock solenoid -N110.
- Printed circuit board is permanently installed in symbol panel, i.e. symbol panel must be replaced if printed circuit board is defective.
- Selector lever lock solenoid -N110 cannot be deactivated, i.e. selector lever cannot be moved out of positions P or D even by pressing brake pedal.
- When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18170 P1762 Select. lev. lock=>solenoid -N110 1)	Short to positive 3) Selector lever lock solenoid -N110 defective	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 84, Display Group Number 003 4)



Short to positive		- Perform Electrical Check =>Page 123 Replace selector lever lock solenoid -N110 if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism
	Short circuit on shift mechanism printed circuit board	- Replace shift mechanism symbol panel2) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism
	Automatic gearbox control unit - J217 defective	- If necessary, replace control unit - J217 => Page 3

Refer to next page for notes and footnotes on fault code 18170 / P1762.

- 1) Selector lever lock=>solenoid -N110 is also referred to as selector lever lock solenoid -N110.
- 2) Printed circuit board is permanently installed in symbol panel, i.e. symbol panel must be replaced if printed circuit board is defective.
- 3) Selector lever lock solenoid -N110 cannot be activated in selector lever positions P and N, i.e. it is possible to shift out of P and N without pressing brake pedal.
- 4) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18171 P1763 Select. lev. lock=>solenoid -N110 1) Open circuit	Open circuit in wiring to selector lever lock solenoid -N110 2) Selector lever lock solenoid -N110 defective Automatic gearbox control unit - J217 defective	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 84 , Display Group Number 003 3) - Perform Electrical Check =>Page 123 Replace selector lever lock solenoid -N110 if necessary => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Servicing shift mechanism - If necessary, replace control unit - J217 => Page 3

- 1) Selector lever lock=>solenoid -N110 is also referred to as selector lever lock solenoid -N110.
- 2) Selector lever lock solenoid -N110 cannot be activated in selector lever positions P and N, i.e. it is possible to shift out of P and N without pressing brake pedal.
- 3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

10 - Part 4, up to fault code 65535

10.1 - Part 4, up to fault code 65535

Display on VAS 5051	Possible cause of trouble	Fault remedy
18179 P1771 1) Load signal from engine CU Open circuit/short to positive	Fault in wiring between engine and gearbox control units or other components also receiving this signal (e.g. on-board computer)	- Use current flow diagram to check wiring and connectors Read measured value block =>Page 84 , Display Group Number 009 2)
18180 P1772 1) Load signal from engine CU Short to earth	Short circuit in components also receiving this signal (e.g. on-board computer) No/incorrect signal being output by engine control unit	- Perform Electrical Check =>Page 123 Check corresponding components (refer to current flow diagram) - Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis

- 1) One of the two fault codes will be stored depending on fault situation.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault codes 18180 / P1772 and 18179 / P1771:

- ♦ Fault detection condition: No problem detected with engine-speed and throttle-valve signals and no load signal detected for 245 ms.
- ♦ If load signal fault is detected by the engine control unit, this fault is transmitted to the gearbox control unit.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18192 P1784 Up/down switch circuit Open circuit/short to earth	Open circuit in wiring or short to earth in connection between engine and gearbox control units (pin 51)	- Use current flow diagram to check wiring and connectors - Read measured value block =>Page 123 Check and, if necessary, replace engine control unit - Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis

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- 1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18192 / P1784:

- ♦ This fault can only occur on vehicle models with no CAN bus A)

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Display on VAS 5051	Possible cause of trouble	Fault remedy
18193 P1785		- Use current flow diagram to check wiring and connectors



Up/down switch circuit	Short to positive in connection between engine and gearbox control units (pin 51)	- Read measured value block =>Page 123 Check and, if necessary, replace engine control unit - Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
Short to positive		

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18193 / P1785:

- ♦ This fault can only occur on vehicle models with no CAN bus A)

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Display on VAS 5051	Possible cause of trouble	Fault remedy
18222 P1814	Open circuit in wiring or short to earth	- Use current flow diagram to check wiring and connectors 1)
Pressure control valve 1 -N215	Pressure control valve 1 -N215 2) defective	- Read measured value block =>Page 84 ; Display Group Number 006 3)
Open circuit/short to earth		- Perform Electrical Check => Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 1 -N215 is also referred to as solenoid valve 4 -N91.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18223 P1815	Short to positive	- Use current flow diagram to check wiring and connectors 1)
Pressure control valve 1 -N215	Pressure control valve 1 -N215 2) defective	- Read measured value block =>Page 84 ; Display Group Number 006 3)
Short to positive		- Perform Electrical Check =>Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 1 -N215 is also referred to as solenoid valve 4 -N91.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
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18227 P1819	Open circuit in wiring or short to earth	- Use current flow diagram to check wiring and connectors 1)
Pressure control valve 2 -N216	Pressure control valve 2 -N216 2) defective	- Read measured value block =>Page 84 , Display Group Number 006 3)
Open circuit/short to earth		- Perform Electrical Check => Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 2 -N216 is also referred to as solenoid valve 5 -N92.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18228 P1820	Short to positive	- Use current flow diagram to check wiring and connectors 1)
Pressure control valve 2 -N216	Pressure control valve 2 -N216 2) defective	- Read measured value block =>Page 84 , Display Group Number 006 3)
Short to positive		- Perform Electrical Check => Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 2 -N216 is also referred to as solenoid valve 5 -N92.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18232 P1824	Open circuit in wiring or short to earth	- Use current flow diagram to check wiring and connectors 1)
Pressure control valve 3 -N217	Pressure control valve 3 -N217 2) defective	- Read measured value block =>Page 84 , Display Group Number 006 3)
Open circuit/short to earth		- Perform Electrical Check => Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 3 -N217 is also referred to as solenoid valve 6 -N93.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

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Display on VAS 5051	Possible cause of trouble	Fault remedy
18233 P1825	Short to positive	- Use current flow diagram to check wiring and connectors 1)
Pressure control valve 3 -N217	Pressure control valve 3 -N217 2) defective	- Read measured value block =>Page 84 , Display Group Number 006 3)



Short to positive		- Perform Electrical Check => Page 123
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1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 3 -N217 is also referred to as solenoid valve 6 -N93.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18237 P1829 Pressure control valve 4 -N218 Open circuit/short to earth	Open circuit in wiring or short to earth Pressure control valve 4 -N218 2) defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 007 3) - Perform Electrical Check => Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 4 -N218 is also referred to as solenoid valve 7 -N94.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18238 P1830 Pressure control valve 4 -N218 Short to positive	Short to positive Pressure control valve 4 -N218 2) defective	- Use current flow diagram to check wiring and connectors 1) - Read measured value block =>Page 84 , Display Group Number 007 3) - Perform Electrical Check => Page 123

1) Start by checking connectors for contact corrosion or ingress of water and replace if necessary. Particular attention is to be paid to 16-pin connector at gearbox between valve body and wiring harness if faults affecting solenoid or pressure control valves are displayed.

2) Pressure control valve 4 -N218 is also referred to as solenoid valve 7 -N94.

3) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Display on VAS 5051	Possible cause of trouble	Fault remedy
18249 P1841 Engine/gearbox control unit Non-matching versions	Incorrect or defective gearbox control unit Incorrect or defective engine control unit	- Check identification of gearbox control unit =>Page 25 and replace if necessary - Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis

		- Read out engine control unit fault memory and eliminate faults => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary
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Display on VAS 5051	Possible cause of trouble	Fault remedy
18258 P1850	Ignition switched on with connector of automatic gearbox control unit -J217 unplugged	- Check connector of wire between engine and gearbox control units
Data bus drive 1)	Open circuit in wiring or short circuit between engine and gearbox control units	- Perform Electrical Check => Page 84 ; Display Group Numbers 0082)and 0092)
Info missing from engine CU	Incorrect or defective engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Replace engine control unit if necessary

1) Drive data bus is also referred to as CAN bus.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18258 / P1850:

- ♦ Exchange of data and information between gearbox control unit and control units communicating with gearbox control unit takes place by way of a so-called CAN bus. All information signals are transmitted by 2 wires.
- ♦ Function of CAN bus => Page 118

Display on VAS 5051	Possible cause of trouble	Fault remedy
18259 P1851	Ignition switched on with connector of automatic gearbox control unit -J217 unplugged	- Check connector of wire between engine and gearbox control units
Data bus drive 1)	Open circuit in wiring or short circuit between engine and gearbox control units/ between ABS and engine control units	- Perform Electrical Check => Page 84 ; Display Group Numbers 0082)and 0092)
	Incorrect or defective ABS control unit	- Check identification of ABS control unit => Running Gear, Front and Four-wheel Drive; Repair Group 01; Self-diagnosis Self-diagnosis
	Incorrect or defective engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
Info missing from ABS CU	Incorrect or defective gearbox control unit	- Check identification of gearbox control unit =>Page 25

Refer to next page for notes and footnotes on fault code 18259 / P1851.

1) Drive data bus is also referred to as CAN bus.

2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18259 / P1851 (CAN bus):

- ♦ Exchange of data and information between gearbox control unit and control units communicating with gearbox control unit takes place by way of a so-called CAN bus. All information signals are transmitted by 2 wires.



- ♦ Function of CAN bus => Page 118

Display on VAS 5051	Possible cause of trouble	Fault remedy
18262 P1854	Open circuit in wiring or short circuit between engine and gearbox control units	- Check connector of wire between engine and gearbox control units Perform Electrical Check => Page 123
Data bus drive 1)	Short circuit between CAN wires	- Read measured value block=>Page 84 ; Display Group Numbers 0082)and 0092)
	Defective engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
Defective hardware	Defective gearbox control unit	- Check identification of gearbox control unit =>Page 25

Refer to next page for notes and footnotes on fault code 18262 / P1854.

- 1) Drive data bus is also referred to as CAN bus.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18262 / P1854:

- ♦ Exchange of data and information between gearbox control unit and control units communicating with gearbox control unit takes place by way of a so-called CAN bus. All information signals are transmitted by 2 wires.
- ♦ Function of CAN bus => Page 118

Display on VAS 5051	Possible cause of trouble	Fault remedy
18263 P1855	Ignition switched on with connector of automatic gearbox control unit -J217 unplugged	- Check connector of wire between engine and gearbox control units Perform Electrical Check => Page 123
Data bus drive 1)		- Read measured value block=>Page 84 ; Display Group Numbers 0082)and 0092)
	Incorrect engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
Software monitoring	Incorrect gearbox control unit	- Check identification of gearbox control unit =>Page 25

Refer to next page for notes and footnotes on fault code 18263 / P1855.

- 1) Drive data bus is also referred to as CAN bus.
- 2) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

Notes on fault code 18263 / P1855 (CAN bus):

- ♦ Exchange of data and information between gearbox control unit and control units communicating with gearbox control unit takes place by way of a so-called CAN bus. All information signals are transmitted by 2 wires.
- ♦ Function of CAN bus => Page 118

Display on VAS 5051	Possible cause of trouble	Fault remedy
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18264 P1856 Throttle valve potentiometer -G69 Fault message from engine CU	Fault in throttle valve potentiometer -G69 diagnosed by engine control unit	- Read measured value block =>Page 84 ; Display Group Numbers 008 1) and 009 1) - Read out stored engine control unit fault codes and eliminate faults
	Fault in wiring between throttle valve potentiometer and engine control unit	
	Incorrect or defective engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
	Incorrect or defective gearbox control unit	- Check identification of gearbox control unit =>Page 25

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Notes on fault code 18264 / P1856:

- ♦ Signal from throttle valve potentiometer -G69 is transmitted from engine control unit via CAN bus wire to gearbox control unit.
- ♦ Fault detection conditions: Fault in component concerned is diagnosed by engine control unit. This fault diagnosis is transmitted via CAN bus wire to gearbox control unit.

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Display on VAS 5051	Possible cause of trouble	Fault remedy
18265 P1857 Load signal Fault message from engine CU	No/incorrect signal being output by engine control unit Fault in "Engine actual torque signal" diagnosed by engine control unit	- Read measured value block=>Page 84 ; Display Group Numbers 0081) and 0091) Read out stored engine control unit fault code and eliminate fault => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis Use current flow diagram to check wiring and connectors
	Incorrect or defective engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
	Incorrect or defective gearbox control unit	- Check identification of gearbox control unit =>Page 25

Refer to next page for notes and footnotes on fault code 18265 / P1857.

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page **84** onwards => under "Reading measured value block".

Notes on fault code 18265 / P1857:

- ♦ Fault detection conditions: Fault in component concerned is diagnosed by engine control unit. This fault diagnosis is transmitted via CAN bus wire to gearbox control unit.
- ♦ Fault detection condition: No problem detected with engine-speed and throttle-valve signals and no load signal detected for 245 ms.
- ♦ If load signal fault is detected by the engine control unit, this fault is transmitted to the gearbox control unit in the form of a duty cycle fault.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18266 P1858	Fault in engine speed sender - G28 diagnosed by engine control unit	- Read measured value block =>Page 84 , Display Group Number 001 1) Read out stored engine control unit fault codes and eliminate faults



Rev signal from engine CU	Incorrect or defective engine control unit	- Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis
Fault message from engine CU	Incorrect or defective gearbox control unit	- Check identification of gearbox control unit =>Page 25

1) When selecting measured value block, note type of gearbox hydraulic control system. For a more detailed description, refer to Page 84 onwards => under "Reading measured value block".

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

- Engine speed signal is transmitted from engine control unit via CAN bus wire to gearbox control unit.
- Fault detection conditions: Fault in component concerned is diagnosed by engine control unit. This fault diagnosis is transmitted via CAN bus wire to gearbox control unit.

Display on VAS 5051	Possible cause of trouble	Fault remedy
18269 P1861 Accelerator position sender -G79 Fault message from engine control unit	Open circuit in wiring or short circuit between accelerator position sender -G79 and engine control unit Accelerator position sender -G79 defective 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 publication.	- Use current flow diagram to check wiring and connectors 1) - Read out stored engine control unit fault code and eliminate fault Check identification of engine control unit => Refer to Engine Workshop Manual; Repair Group 01; Self-diagnosis

1) Start by checking connectors for contact corrosion/ingress of water and replace if necessary.

Display on VAS 5051	Possible cause of trouble	Fault remedy
65535 Control unit defective	Automatic gearbox control unit -J217 defective	- Replace control unit => Page 3

Notes on fault code 65535:

Establish possible cause of trouble and eliminate the following faults:

- Mechanical faults
- Hydraulic faults
- Electr./electronic components and wiring

11 - Final control diagnosis

11.1 - Final control diagnosis

Notes:

- A distinction is made between two types of gearbox:
Gearbox with hydraulic control E17 on which gearbox input speed sender (inductive pick-up) is attached to underside of valve body.
Gearbox with hydraulic control E18/2 on which gearbox input speed sender (Hall sender) is attached behind valve body to gearbox housing.

- ◆ Information as to which gearbox is concerned can be found in the tables in the following Workshop Manual

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Final control diagnosis for gearbox with hydraulic control E17

=> Page **71** onwards

Final control diagnosis for gearbox with hydraulic control E18/2 => Page **74 onwards**

11.2 - Final control diagnosis for gearbox with hydraulic control E17

Notes:

- ◆ Final control diagnosis can only be performed with selector lever set to "P", engine stopped and vehicle stationary.
- ◆ Final control diagnosis is terminated if engine is started.
- ◆ An acoustic check of the operation of solenoid valve 1 -N88, 2 -N89 and 3 -N90, as well as of selector lever lock solenoid is performed during final control diagnosis. Background noise should be avoided during the acoustic check as the switching noise (clicking) of the control elements is very quiet.
- ◆ Solenoid valve 4 -N91, 5 -N92, 6 -N93 and 7 -N94 are actuated by final control diagnosis. It is not possible to actually check operation of these components.
- ◆ During final control diagnosis the individual control elements are actuated for approx. 30 seconds unless ▶ key is pressed beforehand to select next control element.
- ◆ Final control diagnosis is terminated if ▶ key is not pressed within these 30 seconds.
- ◆ Full final control diagnosis procedure can only be implemented once after switching on ignition. Repetition involves switching ignition off and back on again.

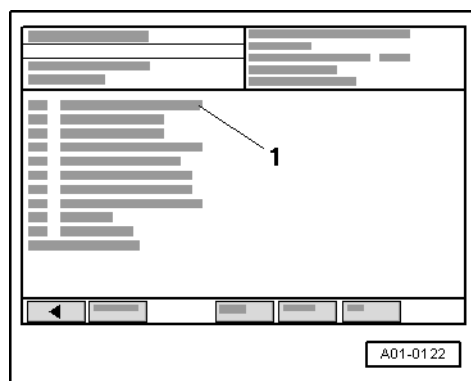
The final control diagnosis function actuates the following components in the stated sequence:

Actuation sequence	Acoustic check
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. Solenoid valve 4 -N91	no
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. Solenoid valve relays	no

Control element fitting locations => Page **3**

Test requirement:

- Fuses OK





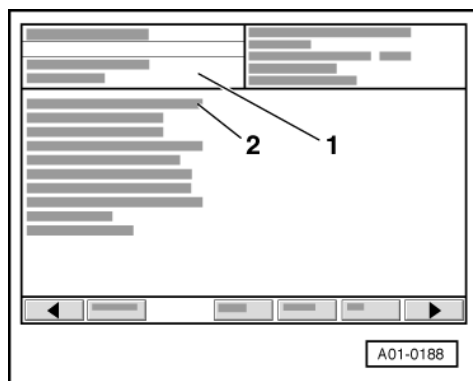
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Sequence of operations

- Connect up vehicle diagnostic, testing and information system VAS 5051 => Page **22** and select vehicle system "02 - Gearbox electronics". Ignition must be on.

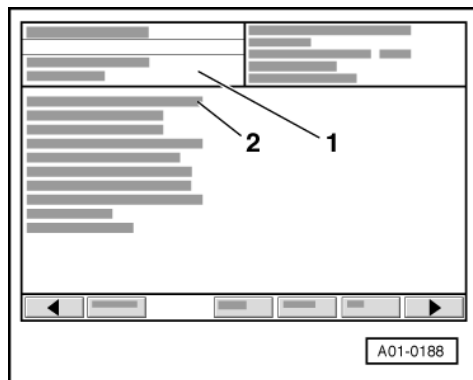
-> Display on VAS 5051:

- From list -1- select diagnosis function "03 - Final control diagnosis".



-> Display on VAS 5051:

- 1 - Display of which control element is being actuated e.g.: "1st control element being tested"
- 2 - Display of which control element is being actuated. On selecting next control element with ▶ key, the final control elements already processed remain listed, with the new control element appearing at the bottom.



Notes:

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*Control element fitting locations => Page **3***

Control elements can now be actuated in the sequence described on the preceding pages.

Next control element can be selected by pressing ▶ key until control element test is completed.

Prior to restarting final control diagnosis, engine must be started and ignition switched off and on again.

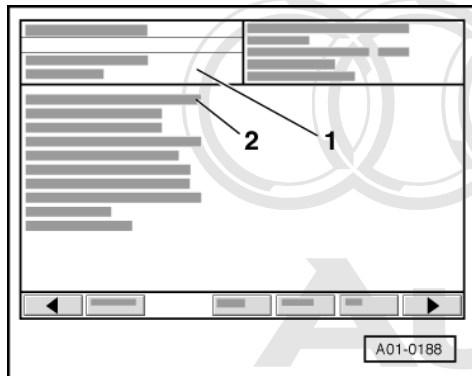
Operation of the first four control elements (solenoid valves 1 -N88, 2 -N89, 3 -N90 and selector lever lock solenoid=>-N110) is checked acoustically during final control diagnosis. Background noise should be avoided during the acoustic check as the switching noise (clicking) of the control elements is very quiet.

- Background noise should be avoided during the acoustic check as the switching noise (clicking) of the control elements is very quiet.

- If clicking is not heard for each of the first four control elements on actuation, electrical check must be performed => Page 123 .

None of the other control elements are audible on actuation.

Certain special features of these other control elements are described in the following.

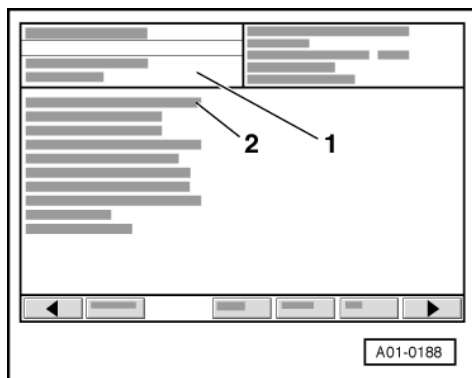


-> Display on VAS 5051:

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

Notes:

- ◆ Kickdown switch -F8 is not actuated, but rather the air-conditioner deactivation function in the automatic gearbox control unit -J217.
- ◆ If kickdown switch is actuated, gearbox control unit switches output to air conditioner to earth. This causes air conditioner compressor to be briefly shut off.
- ◆ Signal can be checked in measured value block 11 => Page 84 .



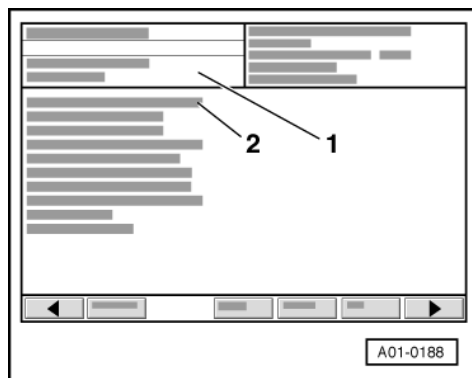
- ◆ For checking kickdown switch -F8 operation, refer to electrical check => Page 123 .
- ◆ Can be ignored in this case. Select next control element using ▶key.

-> Display on VAS 5051:

- 1 - Display: 10th control element being tested
- 2 - Lower display zone: Solenoid valve relays

- Solenoid valves activated in position "P" are actuated (soft clicking can be heard).

- ◆ Can be ignored



-> Display on VAS 5051:

1 - Display: Control element test over

Prior to restarting final control diagnosis, engine must be started and ignition switched off and on again.

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

Notes:

- Final control diagnosis can only be performed with ignition on, selector lever set to "P", engine stopped and vehicle stationary.
- Final control diagnosis is terminated if engine is started.
- An acoustic check of the operation of solenoid valve 1 -N88, 2 -N89 and 3 -N90, as well as of selector lever lock solenoid is performed during final control diagnosis. Background noise should be avoided during the acoustic check as the switching noise (clicking) of the control elements is very quiet.
- Pressure control valves 1 -N215, 2 -N216, 3 -N217 and 4 -N218 are actuated by final control diagnosis. It is not possible to actually check operation of these components.
- During final control diagnosis the individual control elements are actuated for approx. 30 seconds unless ▶ key is pressed beforehand to select next control element.
- Final control diagnosis is terminated if ▶ key is not pressed within these 30 seconds.
- Full final control diagnosis procedure can only be implemented once after switching on ignition. Repetition involves switching ignition off and back on again.

Actuation sequence	Acoustic check
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

Control element fitting locations => Page 3

Test requirement:

- Fuses OK



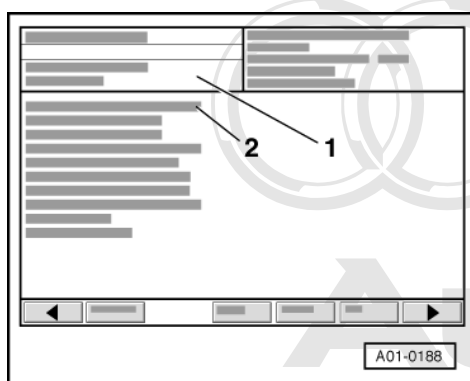
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Sequence of operations

- Connect up vehicle diagnostic, testing and information system VAS 5051 => Page 22 and select vehicle system "02 - Gearbox electronics". Ignition must be on.

-> Display on VAS 5051:

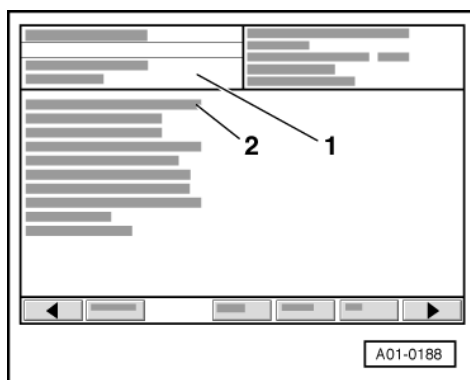
- From list -1- select diagnosis function "03 - Final control diagnosis".



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-> Display on VAS 5051:

- 1 - Display of which control element is being actuated e.g.: "1st control element being tested"
- 2 - Display of which control element is being actuated. On selecting next control element with ▶ key within 30 seconds, the final control elements already processed remain listed, with the new control element appearing at the bottom.





Notes:

Control element fitting locations => Page **3**

Control elements can now be actuated in the sequence described on the preceding pages.

Next control element can be selected by pressing ▶ key until control element test is completed.

Prior to restarting final control diagnosis, engine must be started and ignition switched off and on again.

Operation of the first four control elements (solenoid valves 1 -N88, 2 -N89, 3 -N90 and selector lever lock solenoid => -N110) is checked acoustically during final control diagnosis.

- Background noise should be avoided during the acoustic check as the switching noise (clicking) of the control elements is very quiet.
- If clicking is not heard for each of the first four control elements on actuation, electrical check must be performed => Page **123**.

None of the other control elements are audible on actuation.

Certain special features of these other control elements are described in the following.

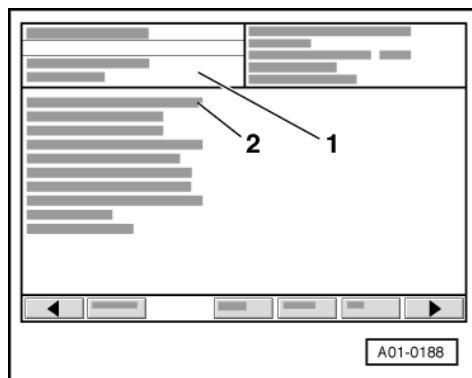


-> Display on VAS 5051:

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

Note:

On account of a software error, "pressure control valve 5 -N233" may now erroneously be displayed although this does not exist. This display can be ignored. Select next control element using ▶key.

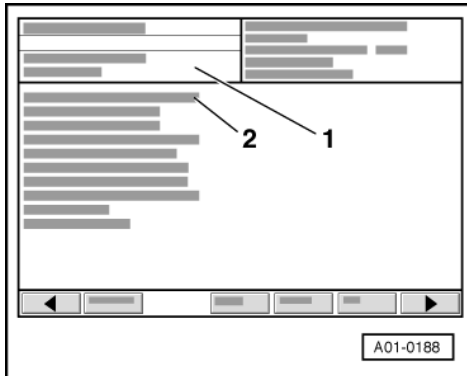


-> Display on VAS 5051:

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

Notes:

- ♦ Kickdown switch -F8 is not actuated, but rather the air-conditioner deactivation function in the automatic gearbox control unit -J217.
- ♦ If kickdown switch is actuated, gearbox control unit switches output to air conditioner to earth. This causes air conditioner compressor to be briefly shut off.
- ♦ Signal can be checked in measured value block 11 => Page 84 .
- ♦ For checking kickdown switch -F8 operation, refer to electrical check => Page 123 .



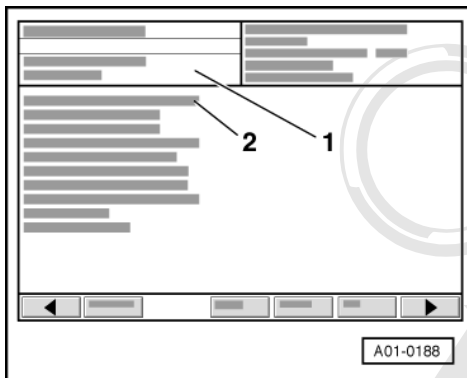
- ♦ Can be ignored in this case. Select next control element using ◀ key.

-> Display on VAS 5051:

- 1 - Display: 10th control element being tested
- 2 - Lower display zone: Solenoid valve relays

- Solenoid valves activated in position "P" are actuated (soft clicking can be heard).

- ♦ Can be ignored



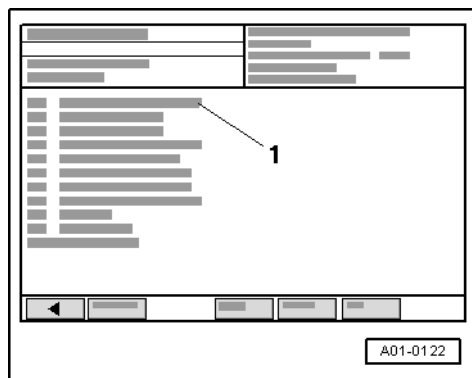
-> Display on VAS 5051:

- 1 - Display: Control element test over

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Prior to restarting final control diagnosis, engine must be started and ignition switched off and on again.

- Terminate function "03 - Final control diagnosis" by touching ▶ key.



-> Display on VAS 5051:

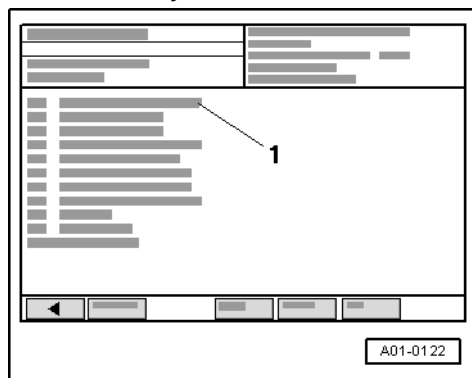
- Select diagnosis function "06 - End of output" in list => Page 80 .

12 - Erasing fault memory

12.1 - Erasing fault memory

Note:

If fault memory cannot be erased, interrogate fault memory again and eliminate fault.



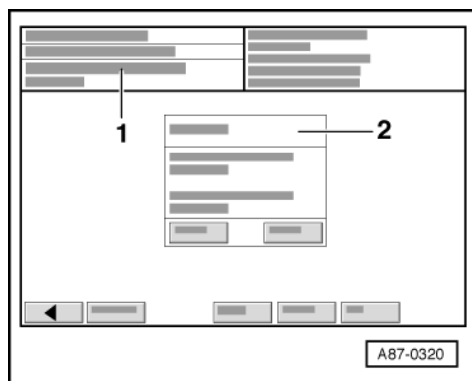
Requirement:

- Fault memory interrogated => Page 26
- All faults eliminated

After fault memory interrogation:

-> Display on VAS 5051:

- From list -1- select diagnosis function "05 - Erasing fault memory".



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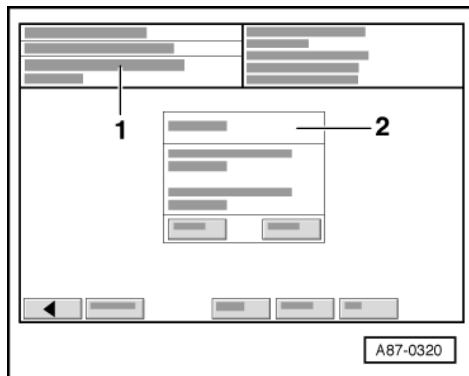
-> Display on VAS 5051:

- 1 - - No display (prior to erasing)
- or
- Fault memory erased

Note:

If the following message appears in display zone -1-: "Fault memory not yet interrogated", this means that sequence of operations has not been precisely observed. Fault memory cannot be erased until it has been interrogated.

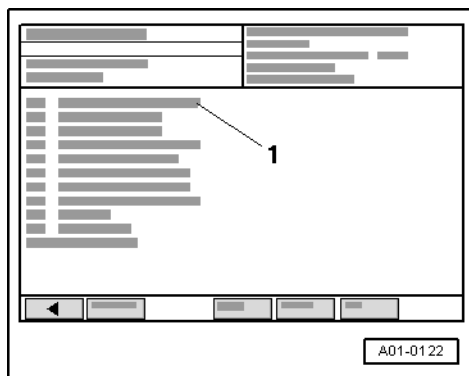
Fault memory is not erased if, for example, ignition is switched off between interrogation and cancellation of fault memory.



-> Display on VAS 5051:

- 2 - Note:
- Is function to be implemented?
- Note: Data will be erased!

- Touch "OK" key in display -2-.
- Terminate function "05 - Erasing fault memory" by touching ◀ key.



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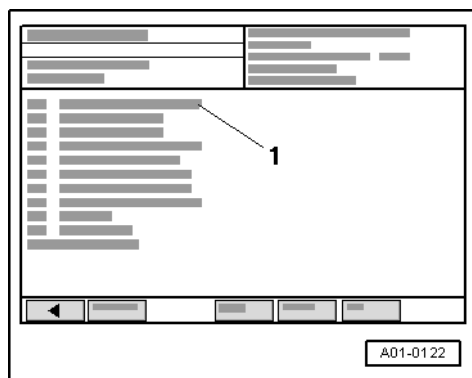
-> Display on VAS 5051:

- Select diagnosis function "06 - End of output" in list => Page 80 .



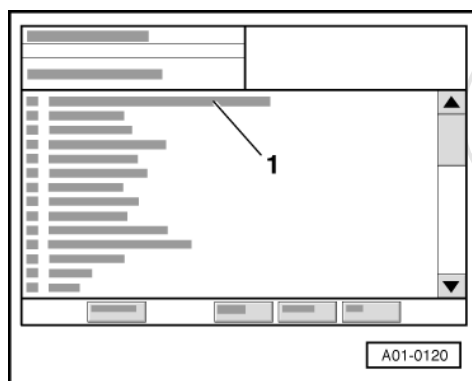
13 - End of output

13.1 - End of output



-> Display on VAS 5051:

- From list -1- select diagnosis function "06 - End of output".



-> Display on VAS 5051:

- Switch off ignition and unplug diagnostic connector when this display appears.

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14 - Encoding control unit

14.1 - Encoding control unit

The gearbox control unit can be encoded.

Sequence of operations

- Connect up vehicle diagnostic, testing and information system VAS 5051 => Page **22** and select vehicle system "02 - Gearbox electronics". Ignition must be on.



Note:

Encoding can only be performed with ignition on and selector lever set to "P" or "N". Accelerator pedal must remain in idle position. Vehicle must be stationary and engine must not be started.

-> Display on VAS 5051:

- 2 - Gearbox control unit identification => Page 25

Note:

Gearbox/engine combination concerned can be established by reading out gearbox control unit identification. Encoding table can then be used to check whether correct code has been entered.

- Interrogate fault memory and eliminate all stored faults prior to encoding => Page 26 .

Note:

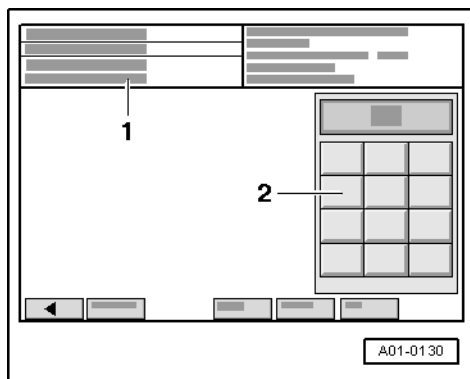
- ♦ Following encoding, fault memory is automatically erased in control unit.



-> Display on VAS 5051:

- From list -1- select diagnosis function "07 - Encoding control unit".

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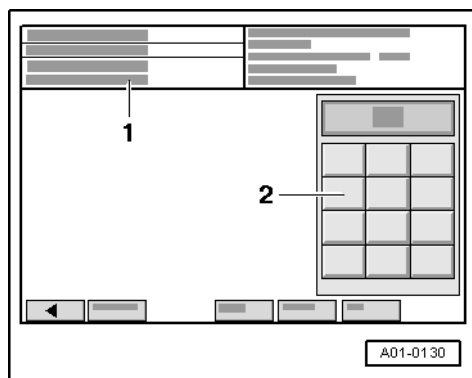


-> Display on VAS 5051:

- 1 - Enter code word
Highest possible entry = 32767
- Use keypad -2- to enter control unit code as per encoding table
=> Page 83 .

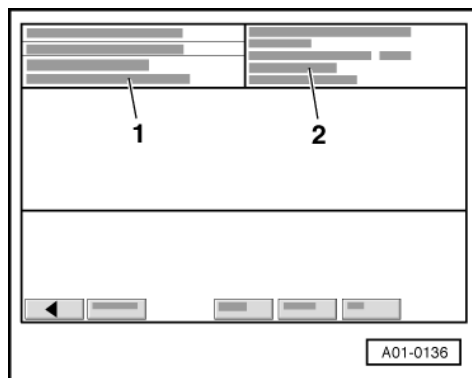


- Confirm entry by touching Q key.



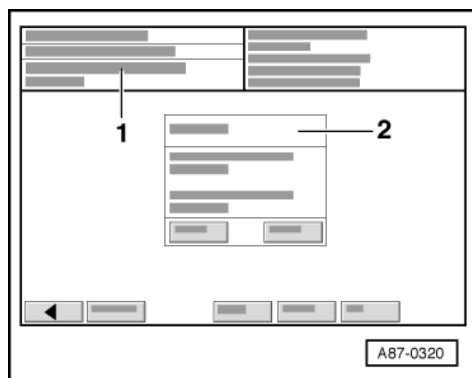
-> Display on VAS 5051:

- 1 - Encoding in progress
- Wait until next display appears.



-> Display on VAS 5051:

- 1 - Vehicle-system encoding completed
- 2 - Control-unit identification with new code (old code in brackets)
- Terminate function "07 - Encoding control unit" by touching ◀ key.



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If invalid code is entered:

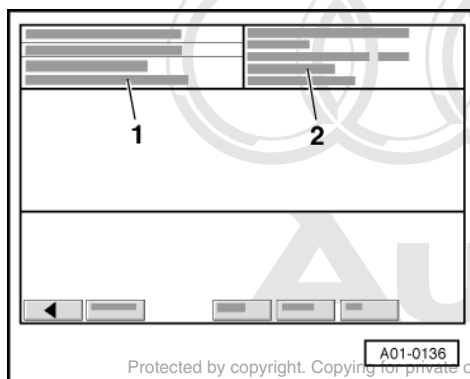
Note:

- ♦ If an incorrect code is entered, the control unit retains the old code.

-> Display on VAS 5051:

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

Or



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-> Display on VAS 5051:

- 1 - Vehicle-system code word not accepted
- Repeat encoding by touching ◀ key.

14.2 - Encoding tables

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

Code	Engine	Tiptronic strategy	Dynamic shift program (DSP)	Market	Type of drive
00000	All valid engine/gearbox combinations without electronic throttle and additionally for 6-cylinder TDI engines, EU-II (2.5 ltr. V6 TDI 110 kW, EU II) with electronic throttle This information can be found in the following Workshop Manual:	Old strategy 1) or Vehicles without Tiptronic	DSP active	All	FWD and quattro
00010	=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features		DSP not active 2)	All	FWD and quattro



Refer to next page for footnotes and notes on encoding table.

1) "New" Tiptronic strategy means: On shifting selector lever to Tiptronic gate, gearbox automatically shifts up or down before speed governing limit is reached so that engine is always operating between idling and breakaway speed. Shiftdown is also automatically implemented if accelerator is depressed as far as kickdown.

"Old" Tiptronic strategy means: On shifting selector lever to Tiptronic gate, gearbox only shifts up or down if selector lever is moved to front (+) or to rear (-). If vehicle is braked to a standstill, first gear is automatically activated for driving off.

2) This code may only be used if required for test purposes. Wherever possible, DSP should always be kept activated to ensure compliance with emission limit values.

2. For vehicles with electronic throttle, except 6-cylinder TDI engines, EU-II (2.5 ltr. V6 TDI 110 kW, EU-II) with electronic throttle

Code	Engine	Tiptronic strategy	Dynamic shift program (DSP) 2)	Market	Type of drive
00000	Impermissible code				
00001	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	Rest of world	quattro drive
00002	This information can be found in the following Workshop Manual	New 1)	DSP active	USA and Canada	quattro drive
00003	=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features	New 1)	DSP active	Rest of world	Front-wheel drive
00004		New 1)	DSP active	USA and Canada	Front-wheel drive

Refer to next page for footnotes and notes on encoding table.

1) "New" Tiptronic strategy means: On shifting selector lever to Tiptronic gate, gearbox automatically shifts up or down before speed governing limit is reached so that engine is always operating between idling and breakaway speed. Shiftdown is also automatically implemented if accelerator is depressed as far as kickdown.

"Old" Tiptronic strategy means: On shifting selector lever to Tiptronic gate, gearbox only shifts up or down if selector lever is moved to front (+) or to rear (-). If vehicle is braked to a standstill, first gear is automatically activated for driving off. If this "old" strategy is to be checked for test purposes, 00021 must be encoded instead of 00001 or 00022 instead of 00002 etc. Encoding must however be switched back to the corresponding above-mentioned code afterwards.

2) Wherever possible, DSP should always be kept activated to ensure compliance with emission limit values. Codes for DSP deactivation are therefore not given here.

15 - Reading measured value block

15.1 - Reading measured value block

Notes:

- ♦ A distinction is made between two types of gearbox:

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

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

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

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

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

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

Notes:

"Reading measured value block" Section for gearbox with hydraulic control E18/2 => Page **103** onwards.

Attention:

To avoid risk of accident when performing measurement and test drives, pay attention to safety precautions
=> Page **21**.

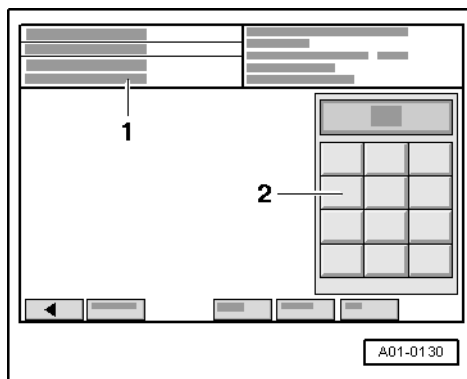
Sequence of operations



- Connect up vehicle diagnostic, testing and information system VAS 5051 => Page **22** and select vehicle system "02 - Gearbox electronics". Ignition must be on.

-> Display on VAS 5051:

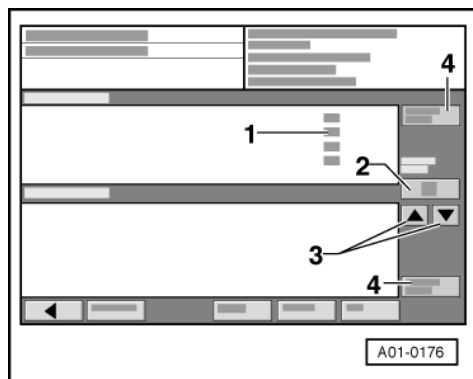
- From list -1- select diagnosis function "08 - Reading measured value block".





-> Display on VAS 5051:

- 1 - Enter display group
Highest possible entry = 255
- Use keypad -2- to enter required "display group number" =>List of display groups, Page 87 and confirm by touching Q key.



-> Display on VAS 5051:

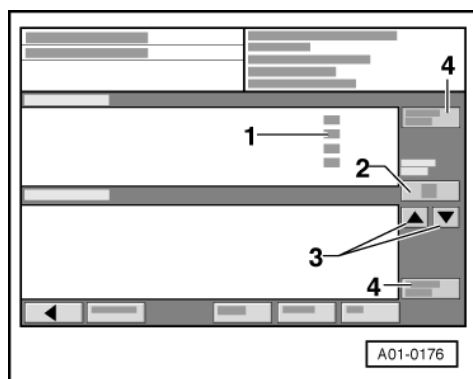
- 1 - Display zone 1
- Display zone 2
- Display zone 3
- Display zone 4

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Notes:

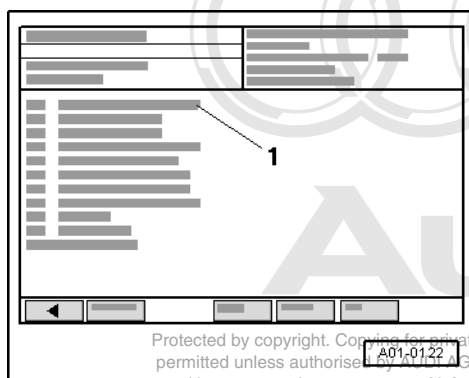
Line remains blank if a display zone is not used.

- 2 - Display group required appears here.
- 3 - Different display group can be selected by touching these keys.
- 4 - Different function can be selected by touching keys -4- (e.g. to switch from "Reading measured value block" to "Basic setting" and back again).



-> Display on VAS 5051:

- A new display group number can be entered by touching ◀ key.
- Terminate function "08 - Reading measured value block" by touching ◀ key again.



-> Display on VAS 5051:

- Select diagnosis function "06 - End of output" in list => Page 80 .

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

Display group number	Display zone	Designation	Explanatory notes on Page
001	1	Engine speed	Test table =>Page 89 onwards
	2	Gearbox input speed sender -G182	
	3	Gearbox speed sender -G38	
	4	Gear engaged	
002	1	Driving dynamics index	
	2	Throttle valve value	
	3	Gearbox speed sender -G38	
	4	Gear engaged	
003	1	Brake	
	2	"P" "N" lock	
	3	Vehicle speed	
	4	Supply voltage/pin 54, 55	

Continued on next page

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

Display group number	Display zone	Designation	Explanatory notes 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) Engine intervention request 2)	
005	1	Solenoid valve 1 -N88	
	2	Solenoid valve 2 -N89	
	3	Solenoid valve 3 -N90	
	4	Gear engaged	



Display group number	Display zone	Designation	Explanatory notes on Page
006	1	Specified current of solenoid valve 4	
	2	-N91	
	3	Specified current of solenoid valve 5	
	4	-N92 Specified current of solenoid valve 6 -N93 Gear engaged	

1) Vehicles with CAN bus only. For a precise definition of which vehicles are fitted with CAN bus, refer to

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

2) Vehicles with no CAN bus only For a precise definition of which vehicles are fitted with CAN bus, refer to

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Continued on next page

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

Display group number	Display zone	Designation	Explanatory notes on Page
007	1	ATF temperature	Test table =>Page 89 onwards
	2	Specified current of solenoid valve 7 -	
	3	N94	
	4	Torque converter clutch Torque converter slip speed	
008	1	Kickdown switch	
	2	Throttle valve value	
	3	Engine torque in Nm 1)	
	4	Throttle valve duty cycle in % 2) Overrun/"under acceleration"	

1) Vehicles with CAN bus only. For a precise definition of which vehicles are fitted with CAN bus, refer to

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

2) Vehicles with no CAN bus only For a precise definition of which vehicles are fitted with CAN bus, refer to

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Continued on next page

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

Display group number	Display zone	Designation	Explanatory notes on Page
009 1)	1	Actual engine torque	
	2	Maximum torque	
	3	Engine speed	
	4	Throttle valve value	

Display group number	Display zone	Designation	Explanatory notes on Page
009 2)	1	Actual engine torque	Test table =>Page 89 onwards
	2	Engine speed	
	3	Throttle valve value	
	4	Consumption signal	
010	1	Torque increase in torque converter	
	2	Engine speed	
	3	Gear engaged	
	4	Traction control system (TCS)	
011	1	Selector lever position	
	2	Tiptronic recognition	
	3	Change-up/change-down position for	
	4	Tiptronic switch -F189 Air conditioner kickdown	

- 1) Vehicles with CAN bus only. For a precise definition of which vehicles are fitted with CAN bus, refer to
=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features
- 2) Vehicles with no CAN bus only For a precise definition of which vehicles are fitted with CAN bus, refer to
=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

16.2 - Test table for gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
001	1	Engine speed	With engine running	approx. 0...8200 rpm	- Perform Electrical Check => Page 21 and replace if necessary Read out fault codes of engine control unit and check identification if necessary
	2	Gearbox input speed sender -G182	Whilst driving with gear engaged 1)	... rpm	- Refer to fault table, fault code 17100 / P0716 => Page 27
	Continued ▼		R	approx. 0...10	
			1M	approx. 0...10	

- 1) Whilst driving: 2nd mechanic required for readout of specifications.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
001	2	Gearbox input speed sender -G182	1 "Under acceleration"	approx. 0...10	- Perform Electrical Check => Page 123



Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
Continued ▼			1 Overrun	approx. 0...300	- Read measured value block, display group number 007 and, whilst driving, establish which elements are defective/ not activated
			2	approx. 0...4000 1)	
			3	approx. 0...8200 1)	
			4	approx. 0...8200 1)	
			5	approx. 0...8200 1)	

1) Display should react in accordance with engine speed in display zone 1, i.e. gearbox input speed should increase and decrease as engine speed increases and decreases.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/specification	Measures if reading does not match specification
001 Continued ▼	3	Gearbox speed sender -G38 2)	Whilst driving with gear engaged 1)	... rpm 3)	- Refer to corresponding fault code for gearbox speed sender - G38 (-G195) 2)
			R	approx. 0...2000	- Perform Electrical Check => Page 123
			1M, 1	approx. 0...1200	- Read measured value block, Display group number 007
			2	approx. 0...4000	
			3	approx. 0...5800	
			4	approx. 0...8200	
			5	approx. 0...8200	- and, whilst driving, establish which elements are defective/ not activated

Refer to next page for notes and footnotes on display zones 1 to 3 of display group number 001.

1) Whilst driving: 2nd mechanic required for readout of specifications.

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

3) Display should react in accordance with engine speed in display zone 1, i.e. gearbox speed (output speed) should increase and decrease as engine speed increases and decreases.

Note on display group number 001, display zones 1 to 3:

- ♦ Test condition: Gearshift operation must be over. Vehicle must not be in overrun mode (not travelling downhill or with engine brake).

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
001	4	Gear engaged	Whilst driving Selector lever position 1)		- Check solenoid valves. Refer to display group numbers 005 and 006
			"N"	"1"... "5" 2)	- Refer to fault table, fault codes of corresponding solenoid valves
			"R"	"R"	- Check selector lever position, display group number 004
			"D"	"1" "2" "3" "4" "5"	
			"4"	"1" "2" "3" "4"	
			"3"	"1" "2" "3"	
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Refer to next page for notes and footnotes on display zone 4 of display group number 001.

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) The gearbox control unit is equipped with automatic gear pre-select display function. Display shows the forward gear which would be activated by the gearbox control unit on switching to selector lever position "D".

Note on gear engaged:

- ♦ Defective solenoid valves or other diagnosed faults may prevent a specific gear being engaged.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions		Display on VAS 5051/ specification	Measures if reading does not match specification
002	1	Driving dynamics index (of dynamic shift program)	Whilst driving normal-ly1)	Min. value (highly economical)	0	Depends on driving style and road conditions (acceleration, accelerator action, vehicle speed and load)
				Max. value (very sporty)	240	High values switch shift points to higher engine speeds
			Warm-up program activated	241	Gearshift operations to be avoided if possible	
			Traction control activated	242		
			Tip-Tronic recognition activated	243		- Refer to corresponding fault codes of Tiptronic switch -F189



Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
			CCS (cruise control system) map	244	For USA only, can be ignored at present

1) Whilst driving: 2nd mechanic required for readout of specifications.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
002	2	Throttle valve value 3)	Stationary Idling speed	0...1 %	% value increases constantly on accelerating from idle to full throttle
			Full throttle	99...100 %	- Perform Electrical Check => Page 123 Refer to corresponding fault codes of throttle valve potentiometer -G69 or accelerator position sender -G79
	3	Gearbox speed sender -G38 2)	Whilst driving 1)	0...8200	- Refer to corresponding fault code for gearbox speed sender -G38 (-G195) 2) Refer to display group number 001
	4	Gear engaged	Refer to display group number 1, display zone 4		

1) Whilst driving: 2nd mechanic required for readout of specifications.

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

3) Accelerator pedal value (from -G79) is displayed here for V6 TDI engines.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
003	1	Brake light switch -F	Brake not actuated	-	- Refer to corresponding fault code of brake light switch -F
			Brake actuated	Brake	- Perform Electrical Check => Page 123
	2	Selector lever lock solenoid -N110 2)	Stationary, selector lever set to position P or N	P N active	- Refer to corresponding fault code of selector lever lock solenoid -N110 2)
			Brake actuated	P N deactivated	- Check selector lever lock solenoid -N110, perform Electrical Check =>Page 123

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
Continued ▼	3	Vehicle speed	Whilst driving 1)	...km/h	Speedometer display and values on V.A.G 1551 may differ slightly If necessary, check speedometer sender -G22

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Selector lever lock solenoid -N110 is also referred to as selector lever lock => solenoid -N110.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
003	4	Supply voltage/term. 15	Stationary	Min. 10.0 V	- Perform Electrical Check => Page 123
				Max. 16.0 V	- Refer to fault table, fault code 00532 => Page 27
004 Continued ▼	1	ATF temperature	Stationary with engine running	...°C	- Perform Electrical Check => Page 123 Refer to corresponding fault code of gearbox oil temperature sender -G93

Notes on ATF temperature:

- ♦ A detected temperature of minus 50°C is an indication of short to earth
- ♦ A detected temperature of 180°C is an indication of short to positive or open circuit

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004	2	Selector lever position (multi-function switch - F1251))	Stationary	P	- Check multi-function switch -F125; display group number 004
			Selector	R	- Perform Electrical Check => Page 123
			lever	N	Check compliance with display in dash panel insert
			set to	D	
				4	
				3	If necessary, adjust selector lever cable

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Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
Continued ▼			2	2	=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism

1) Multi-function switch -F125 is also referred to as driving range sensor -F125.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004	3	Multi-function switch - F1251)	Stationary Selector lever position	L1 L2 L3 L4	- Refer to corresponding fault code of multi-function switch -F125 1) - Check multi-function switch -F125 - Perform Electrical Check => Page 123 - If necessary, adjust selector lever cable => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism
			P	1000	
			R	0100	
			N	1110	
			D	1011	
			4	0111	
Continued ▼			3	0001	
			2	0010	

1) Multi-function switch -F125 is also referred to as driving range sensor -F125.

Note on display zone 3 of display group number 004:

- ♦ Input signals of 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
Wiring 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 referred to as driving range sensor -F125.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004 without CAN bus	4	Engine intervention (ignition adjustment)	Whilst driving 1) Engine speed signal OK	Eng interv	- Refer to fault table, fault codes 00545, 18192 and 18193 => Page 27 - Perform Electrical Check => Page 123
			Switched on	-	- Check wiring to engine control unit
			Switched off	-	- Only replace automatic gearbox control unit -J217 if necessary => Page 3

1) Whilst driving: 2nd mechanic required for readout of specifications.

Refer to next page for notes on display zone 4 of display group number 004.

Notes on display zone 4 of display group number 004:

- ♦ This display zone 4 is only applicable to vehicle models with no CAN bus. For vehicle models with CAN bus refer to display zone 4 on next page. A)
- ♦ Engine intervention is only activated during a gearshift operation. Depending on driving situation, engine intervention may only be activated very briefly, i. e. this brief engine intervention may be disregarded by the relatively slow data transfer to the V.A.G 1551 under certain circumstances.

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004 with CAN bus	4	On-board diagnosis information Indicated on display from left to right	Whilst driving 1)		Can be ignored
		Fault display	On	1	
			Off	0	
		Trip	Completed	1	
			Not completed	0	
		Gearbox warm-up	Completed	1	
			Not completed	0	
		Engine start	Detected	1	



Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
			Not detected	0	

1) Whilst driving: 2nd mechanic required for readout of specifications.

For notes on display zone 4 of display group number 004 => refer to next page.

Notes on display zone 4 of display group number 004:

- ♦ This display zone 4 is only applicable to vehicle models with CAN bus. For vehicle models with no CAN bus refer to preceding display zone 4. A)

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

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=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions		Display on VAS 5051/ specification	Measures if reading does not match specification
005	1	Solenoid valve 1 -N88 2)	Whilst driving1)	Gear engaged		- Refer to corresponding fault code of solenoid valve 1 -N88 2) - Perform Electrical Check => Page 123
				R, 5, 2, 1, 1M	1	
				3, 4	0	
	2	Solenoid valve 2 -N89 3)	Whilst driving1)	Gear engaged		- Refer to corresponding fault code of solenoid valve 2 -N89 3) - Perform Electrical Check => Page 123
				3, 2, 1	1	
				R, 1M, 4, 5	0	
Continued ▼						

1) Whilst driving: 2nd mechanic required for readout of specifications.

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

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

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions		Display on VAS 5051/ specification	Measures if reading does not match specification
005	3	Solenoid valve 3 -N90 2)	Whilst driving1)	Gear engaged		- Refer to corresponding fault code of solenoid valve 3 -N90 2)
				3, 4, 5	X	

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
			R, 1, 1M, 2	0	- Perform Electrical Check => Page 123
	4	Gear engaged	Refer to display group number 1, display zone 4		

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Solenoid valve 3 -N90 is also referred to as switch valve 3=>solenoid 3 -N90.

Notes on display group number 005, display zones 1 to 3:

- ♦ Non-switched solenoid valves are indicated by "0", switched solenoid valves by "1".
- ♦ Solenoid valves with variable switching are indicated by "X".

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
006	1	Specified current of solenoid valve 4 -N91 2)	Whilst driving 1)		- Refer to fault table, fault code 00264 or, for 6-cyl. TDI, fault codes 18222 and 18223 => Page 27
				min. 0.1 A	- Perform Electrical Check => Page 123
				max 0.8 A	
	2	Specified current of solenoid valve 5 -N923)	Whilst driving 1)		- Refer to fault table, fault code 00266 or, for 6-cyl. TDI, fault codes 18227 and 18228 => Page 27
				min. 0.1 A	- Perform Electrical Check => Page 123
				max 0.8 A	
Continued ▼					

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 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.

Applies only to gearbox with hydraulic control E17

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Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
006	3	Specified current of solenoid valve 6 -N93 2)	Whilst driving 1)		- Refer to fault table, fault code 00268 or, for 6-cyl. TDI, fault codes 18232 and 18233 => Page 27



Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
				min. 0.1 A	- Perform Electrical Check => Page 123
				max 0.8 A	
	4	Gear engaged	Refer to display group number 001, display zone 4		

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Solenoid valve 6 -N93 is also referred to as pressure control valve 3 -N217.

Note on specified current of solenoid valves:

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

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Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
007	1	ATF temperature	Stationary with engine running, substitute value is output if temperature sender is defective	...°C	- Check gearbox oil temperature sender -G93; perform Electrical Check=>Page 123
	2	Specified current of solenoid valve 7 -N94 2)	Whilst driving 1)	0.1 A	- Refer to fault table, fault code 00270 or, for 6-cyl. TDI, fault codes 18237 and 18238 => Page 27
				max. 0.8 A	
	3	Torque converter clutch	Whilst driving 1)	TCC disengaged	- Refer to fault table, fault code 01192 or, for 6-cyl. TDI, fault code 17125 => Page 27
				TCC regul.	
				TCC engaged	
Continued ▼					

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Solenoid valve 7 -N94 is also referred to as pressure control valve 4 -N218.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
007	4	Torque converter slip speed	Whilst driving 1) TCC disengaged	0.....Stall speed	- Refer to fault table, fault codes 00297, 00660 and 01192 or, for 6-cyl. TDI, fault codes 17106 and 17125 => Page 27

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
			TCC regul. (last shift operation min. 20 s ago)	20...120 rpm	- Establish which element is defective or not activated; gearbox with selector elements => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Gearbox with selector elements Gearbox with selector elements
			TCC engaged	0...10 rpm	- Check mutual plausibility of engine, gearbox input and gearbox speeds; display group number 001

1) Whilst driving: 2nd mechanic required for readout of specifications.

Refer to next page for notes on display zone 4 of display group number 007.

Test conditions for torque converter slip speeds:

- ♦ "TCC engaged": Shift operation must be over (wait at least 1 s), torque converter lock-up clutch (TCC) engaged and accelerator value constant.
- ♦ "TCC regul.": Values given apply to "regulated status" of torque converter clutch. Under unfavourable circumstances (e.g. uphill acceleration) this status is only achieved 20 s following completion of shift operation. Slip values of up to 350 rpm may be attained during this regulation phase.
- ♦ Excessive torque converter slip speeds may also be an indication of slipping clutches or non-activated selector elements.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
008	1	Kickdown switch - F8	Kickdown Actuated	Kickdown	- Check kickdown switch; perform Electrical Check => Page 123
			Not actuated	-	
Continued ▼	2	Throttle valve value 1)	Stationary Idling speed	0...1 %	% value increases constantly on accelerating from idle to full throttle - Perform Electrical Check => Page 27
			Full throttle	99...100 %	

1) Accelerator pedal value (from -G79) is displayed here for V6 TDI engines.



Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
008	3 3) without CAN bus	Throttle valve duty cycle	Stationary Idling speed	Less than 30%	% value increases constantly on accelerating from idle to full throttle - Perform Electrical Check => Page 27
			Full throttle	Greater than 70%	
Continued ▼	3 2) with CAN bus	Engine torque	Whilst driving 1)	...Nm	Actual engine torque signal is transmitted from engine control unit via CAN bus wire to gearbox control unit

Refer to next page for notes and footnotes on display group number 008.

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
008	4	Overrun/"under acceleration" signal	Whilst driving 1)	Overrun	Downhill travel or deceleration (engine brake)
			"Under acceleration"	-	Normal driving, engine supplying power

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Vehicles with CAN bus only. For a precise definition of which vehicles are fitted with CAN bus, refer to
=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features
- 3) Vehicles with no CAN bus only. For a precise definition of which vehicles are fitted with CAN bus, refer to
=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
009 with CAN bus	1	Actual engine torque	Whilst driving 1)	...Nm	Actual engine torque signal is transmitted from engine control unit via CAN bus wire to gearbox control unit.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
	2	Maximum torque	Whilst driving ¹⁾	...Nm	(Reduced) engine torque requested by gearbox control unit during gearshift operation ²⁾
	3	Engine speed	With engine running	approx. 0...8200 rpm	- Refer to fault table, fault codes 00529 and 00543 => Page 27
	4	Throttle valve value ³⁾	Stationary Idling speed ¹⁾	0...1 %	% value increases constantly on accelerating from idle to full throttle
			Full throttle	99...100 %	- Refer to fault table, fault code 00518 => Page 27

Refer to next page for notes and footnotes on display group number 009 for vehicles with CAN bus.

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Whilst driving in gear, a constant shift torque is displayed as engine torque reduction is not necessary.
- 3) Accelerator pedal value (from -G79) is displayed here for V6 TDI engines.

Note on display group number 009:

- ♦ This display group number 009 is only applicable to vehicle models with CAN bus. For vehicle models with no CAN bus refer to display group number 009 on next page. A)

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
009 without CAN bus	1	Actual engine torque	Whilst driving 1)	...Nm	Engine torque is calculated by gearbox control unit from fuel consumption and engine speed signals
	2	Engine speed	With engine running	approx. 0...8200 rpm	- Refer to fault table, fault codes 00529 and 00543 => Page 123
	3	Throttle valve value ²⁾	Refer to display group number 002, display zone 2		



Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
	4	Fuel consumption signal (high time)	Whilst driving 1)	...ms	Can be ignored

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Accelerator pedal value (from -G79) is displayed here for V6 TDI engines.

Notes on display group number 009 => Refer to next page.

Notes on display group number 009:

- ♦ This display group number 009 is only applicable to vehicle models with no CAN bus. For vehicle models with CAN bus refer to preceding display group number 009. A)
- ♦ On vehicles with Motronic injection and ignition systems engine torque is transmitted by engine control unit. There is no fuel consumption display for these vehicles or display is constantly "00ms".

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

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Applies only to gearbox with hydraulic control E17

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
010	1	Torque increase in torque converter	Whilst driving 1)	1...2,17	Calculated from torque converter slip speed by gearbox control unit
	2	Engine speed	With engine running	approx. 0...8200 rpm	- Perform Electrical Check => Page 27
	3	Gear engaged	Refer to display group number 001, display zone 4		
	4	Traction control system (TCS)	Whilst driving 1) Activated Not activated	TCS active -	Only activated by TCS control unit as required

- 1) Whilst driving: 2nd mechanic required for readout of specifications.

Applies only to gearbox with hydraulic control E17

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Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
011	1	Selector lever position	Refer to display group number 004, display zone 2		
	2	Tiptronic switch - F189	Selector lever in Tiptronic gate	M-switch	- Perform Electrical Check => Page 123 on-wards

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
			Selector lever not in Tiptronic gate	-	
	3	Change-up/change-down position for Tiptronic switch -F189	Selector lever in Tiptronic gate and select gears		- Perform Electrical Check => Page 123 onwards
			Change-up function 3)	Change-up	
			Change-down function2)	Change-down	
	4	Air conditioner kick-down	Whilst driving 1)	Comp. OFF	Air conditioner compressor shutoff is only activated following kickdown change-down
			Not activated	Comp. ON	

Refer to next page for notes and footnotes on display group number 011.

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
 - 2) Change-down (-) must be actuated by tapping selector lever to rear. On vehicles with Tiptronic sports steering wheel, change-down must be actuated by additionally tapping lower left/right button (-) on steering wheel to permit checking of this function as well.
 - 3) Change-up (+) must be actuated by tapping selector lever forwards. On vehicles with Tiptronic sports steering wheel, change-up must be actuated by additionally tapping upper left/right button (+) on steering wheel to permit checking of this function as well.
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17 - Reading measured value block for gearbox with hydraulic control E18/2

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

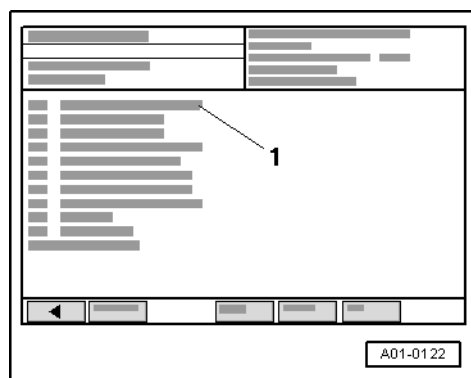
Notes:

"Reading measured value block" Section for gearbox with hydraulic control E17 => Page **85** onwards.

Attention:

To avoid risk of accident when performing measurement and test drives, pay attention to safety precautions
=> Page **21**.

Sequence of operations

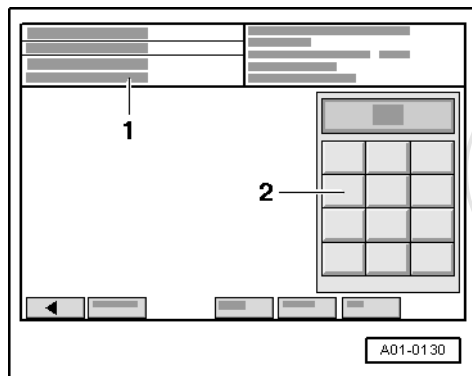




- Connect up vehicle diagnostic, testing and information system VAS 5051 => Page 22 and select vehicle system "02 - Gearbox electronics". Ignition must be on.

-> Display on VAS 5051:

- From list -1- select diagnosis function "08 - Reading measured value block".

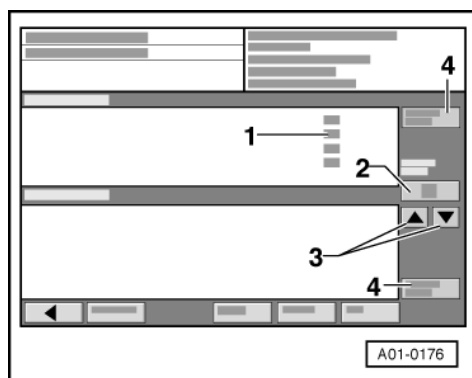


-> Display on VAS 5051:

- 1 - Enter display group
Highest possible entry = 255

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- Use keypad -2- to enter required "display group number" => List of display groups, Page 87 and confirm by touching Q key.



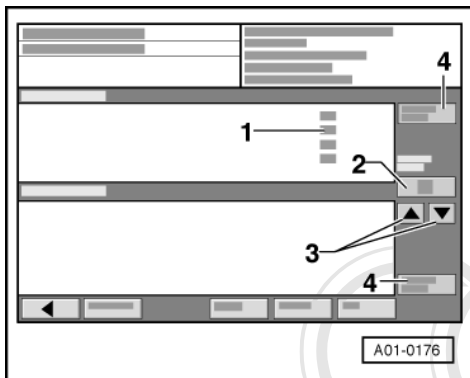
-> Display on VAS 5051:

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

Notes:

Line remains blank if a display zone is not used.

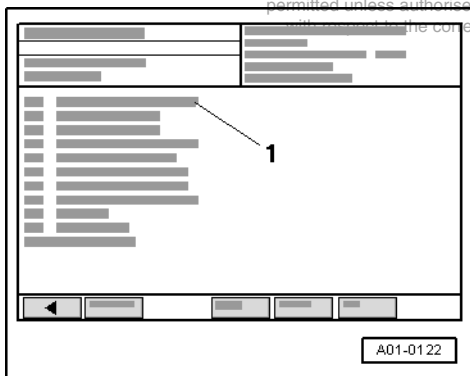
- 2 - Display group required appears here.
- 3 - Different display group can be selected by touching these keys.
- 4 - Different function can be selected by touching keys -4- (e.g. to switch from "Reading measured value block" to "Basic setting" and back again).



-> Display on VAS 5051:

- A new display group number can be entered by touching ◀ key.
- Terminate function "08 - Reading measured value block" by touching ◀ key again.

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-> Display on VAS 5051:

- Select diagnosis function "06 - End of output" in list => Page 80 .

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

Display group number	Display zone	Designation	Explanatory notes on Page
001	1	Engine speed	Test table =>Page 107 onwards
	2	Gearbox input speed sender -G182	
	3	Gearbox output speed sender -G195	
	4	Gear engaged	
002	1	Current program	
	2	Throttle valve value/accelerator position	
	3	Gearbox output speed sender -G195	
	4	Gear engaged	
003	1	Brake light switch	
	2	"P" "N" lock	
	3	Vehicle speed	
	4	Supply voltage	



Display group number	Display zone	Designation	Explanatory notes 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 display group numbers available for gearbox with hydraulic control E18/2

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Display group number	Display zone	Designation	Explanatory notes on Page
005	1	Solenoid valve 1 -N88	Test table =>Page 107 onwards
	2	Solenoid valve 2 -N89	
	3	Solenoid valve 3 -N90	
	4	Gear engaged	
006	1	Specified current of pressure control valve 1 -N215	
	2	Specified current of pressure control valve 2 -N216	
	3	Specified current of pressure control valve 3 -N217	
	4	Can be ignored	
007	1	ATF temperature	
	2	Specified current of pressure control valve 4 -N218	
	3	Torque converter clutch	
	4	Torque converter slip speed	
008	1	Kick-down switch	
	2	Throttle valve value/accelerator position	
	3		
	4	Overrun/"under acceleration"	

Continued on next page

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

Display group number	Display zone	Designation	Explanatory notes on Page
009	1	Actual engine torque	Test table =>Page 107 onwards
	2	Engine speed	
	3	Throttle valve value/accelerator position	
	4		
010	1	Torque increase in torque converter	
	2	Engine speed	
	3	Gear engaged	
	4		
011	1	Selector lever position	
	2	Tiptronic recognition	
	3	Change-up/change-down position for Tiptronic switch -F189	
	4		
012	1	Driving mode, load	
	2	Driving dynamics index	
	3	Motion resistance index	
	4	Driving style factor	
125	1	Reception of engine messages via CAN bus	
	2		
	3	Reception of ABS messages via CAN bus	
	4		

17.2 - Test table for gearbox with hydraulic control E18/2

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
001	1	Engine speed	With engine running	approx. 0...8200 rpm	- Refer to fault table, fault code 17968 / P1560 => Page 27
	2	Gearbox input speed sender -G182	Whilst driving with gear engaged 1)	... rpm	- Refer to fault table, fault code 17100 / P0716 => Page 27
			R	approx. 0...8200	
			1, 1m	approx. 0...2000	- Read measured value block, display group number 006 or 007 and, whilst driving, establish which elements are defective/not activated
			2	approx. 0...8200	
Continued ▼			3	approx. 0...8200	

1) Whilst driving: 2nd mechanic required for readout of specifications.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
001	2		Whilst driving 1)	With gear engaged	- Refer to previous page
				4	
				5	
	3	Gearbox output speed sender - G195	Whilst driving 1)	With gear engaged 1)	- Refer to fault table, fault code 17105 / P0721 => Page 27
				R	
				1, 1m	
				2	
				3	
				4	
					- Read measured value block, display group 006 or 007
					- and, whilst driving, establish which elements are defective/not activated
Continued					



▼			5	approx. 0...8200	
---	--	--	---	---------------------	--

1) Whilst driving: 2nd mechanic required for readout of specifications.

Notes on display group number 001, display zones 1 to 3:

- ♦ Test condition: Gearshift operation must be over. Vehicle must not be in overrun mode (not travelling downhill or with engine brake).

Display group number	Display zone	Designation	Test conditions		Display on VAS 5051/ specification	Measures if reading does not match specification
001	4	Gear engaged	Whilst driving1)	Selector lever position		- Check solenoid valves. Refer to display group numbers 005, 006 and 007.
				"N"	"1"... "5"2)	- Refer to fault table, fault code of corresponding solenoid valves => Page 27
				"R"	"R"	- Check selector lever position, display group number 004
				"D"	"1m" "2" "3" "4" "5"	
				"4"	"1m" "2" "3" "4"	
				"3"	"1m" "2" "3"	
				"2"	"1m" "2"	

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1) Whilst driving: 2nd mechanic required for readout of specifications.

2) The gearbox control unit is equipped with automatic gear pre-select display function. Display shows the forward gear which would be activated by the gearbox control unit on switching to selector lever position "D".

Note on display zone 4, display group number 001:

- ♦ Defective solenoid valves or other diagnosed faults may prevent a specific gear being engaged.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
002	1	Current program	Whilst driving normally1)		Depends on driving style and road conditions (acceleration, accelerator action, vehicle speed and load)
			Dynamic shift program activated	DS	Gearshift operations to be avoided if possible
			Warm-up program activated	WL	Faster upshift to avoid high engine speeds
			Traction control activated	AS	- Check display group number 004

Continued ▼			Tip-Tronic recognition activated	TT	- Refer to fault table, fault codes 18141/P1733 to 18152/P1744 => Page 27
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- 1) Whilst driving: 2nd mechanic required for readout of specifications.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
002	2	Throttle valve value/ value from accelerator position sender	Stationary Idling speed	0...1 %	% value increases constantly on accelerating from idle to full throttle
			Full throttle	99...100 %	- Perform Electrical Check => Page 27
	3	Gearbox output speed sender - G195	Whilst driving1)	0...8200	- Refer to fault table, fault code 17105 / P0721 => Page 27 Refer to display group number 001
	4	Gear engaged	Refer to display group number 001, display zone 4		

- 1) Whilst driving: 2nd mechanic required for readout of specifications.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
003	1	Brake light switch -F	Actuated	Brake	- Refer to fault table, fault code 17087 / P0703 => Page 27
			Not actuated	-	- Perform Electrical Check => Page 123 onwards
	2	Selector lever lock solenoid -N110	Stationary in P, N Brake not pressed	P N active	- Refer to fault table, fault codes 18170 / P1762 and 18196 / P1761 => Page 27
			Brake pressed	P N deactivated	- Check selector lever lock solenoid -N110, perform Electrical Check =>Page 123
Continued ▼					

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
003	3	Vehicle speed	Whilst driving1)	...km/h	- If necessary, check speedometer sender - G22
	4	Supply voltage/term. 15	Stationary min.	10.0 V	- Perform Electrical Check => Page 123



			max.	16.0 V	- Refer to fault table, fault codes 18158 / P1750 and 18159 / P1751 => Page 27
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1) Whilst driving: 2nd mechanic required for readout of specifications.

Note on display zone 3, vehicle speed:

Speedometer display and values on VAS 5051/V.A.G 1551 may differ slightly.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004 Continued ▼	1	ATF temperature	Stationary with engine running	...°C	- Perform Electrical Check => Page 27

Notes on ATF temperature:

- ♦ A detected temperature of minus 50°C is an indication of short to earth
- ♦ A detected temperature of 180°C is an indication of short to positive or open circuit

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004	2	Selector lever position (multi-function switch - F125)	Stationary	P	- Check multi-function switch -F125; display group number 004, display zone 3 - Perform Electrical Check => Page 123 Check compliance with display in dash panel insert - If necessary, adjust selector lever cable => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism; Checking and adjusting selector lever cable
			Selector	R	
			lever	N	
			set to	D	
				4	
				3	
				2	
	Continued ▼				

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004	2 1)	Selector lever position (multi-function switch -F125) Intermediate selector lever mechanism positions	Stationary, selector lever between	P and R or R and D	- Check multi-function switch -F125; display group number 004, display zone 3
				N and D	- Perform Electrical Check => Page 123

Continued ▼				D and 4	Z3	- If necessary, adjust selector lever cable => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism; Checking and adjusting selector lever cable
				4 and 3 or 3 and 2	Z4	

1) This display zone only appears as of Model Year 2000 (May 1999).

Note on intermediate positions:

If selector lever is moved to one of the intermediate positions stated, "Z1", "Z2", "Z3" or "Z4" is displayed on fault reader. Dash panel insert display must not show any selected gear, i.e. only PRND432 is displayed without any gear being highlighted.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004	3	Multi-function switch -F125 (driving range sensor)	Stationary Selector lever position	L1 L2 L3 L4	- Refer to fault table, fault code 17090 / P0706 => Page 27 - Check multi-function switch -F125 - Perform Electrical Check => Page 123 - If necessary, adjust selector lever cable => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism
			P	1000	
			R	0100	
			N	1110	
			D	1011	
			4	0111	
			3	0001	
			2	0010	
Continued ▼					

Note on display zone 3 of display group number 004:

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- ◆ Input signals of multi-function switch -F125 can be checked at gearbox control unit.

Wiring 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 number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
004	4	On-board diagnosis information Indicated on display from left to right	Whilst driving1)		
		Fault display	On	1	



		Trip	Off	0	Can be ignored
			Completed	1	
			Not completed	0	
		Gearbox warm-up	Completed	1	
			Not completed	0	
		Engine start	Detected	1	
			Not detected	0	

1) Whilst driving: 2nd mechanic required for readout of specifications.

Display group number	Display zone	Designation	Test conditions		Display on VAS 5051/ specification	Measures if reading does not match specification
005	1	Solenoid valve 1 - N88	Whilst driving1)	Gear engaged		- Compare display with position of selector elements => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout; Position of selector elements
				R, N, D (1st, 2nd and 5th gear), 2 (1st gear), D (downshift 5th to 4th gear)	X	
				D (3rd and 4th gear)	0	
	2	Solenoid valve 2 - N89	Whilst driving1)	Gear engaged		- Perform Electrical Check => Page 123
				N, D (1st, 2nd and 3rd gear)	X	
Continued ▼				R, D (4th and 5th gear), D (downshift 5th to 4th gear)	0	

1) Whilst driving: 2nd mechanic required for readout of specifications.

Note on display group number 005, display zones 1 to 3:

- ♦ Non-switched (inactive) solenoid valves are indicated by "0", switched (active) solenoid valves by "X".

Display group number	Display zone	Designation	Test conditions		Display on VAS 5051/ specification	Measures if reading does not match specification
005	3	Solenoid valve 3 - N90	Whilst driving1)	Gear engaged		- Compare display with position of selector elements => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout; Position of selector elements
				D (downshift 5th to 4th gear)	X	
				D (3rd, 4th and 5th gear) 2)	X or 0 2)	

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
			R, N, D (1st and 2nd gear), 2 (1st gear)	0	- Perform Electrical Check => Page 123
	4	Gear engaged	Refer to display group number 001, display zone 4		

- 1) Whilst driving: 2nd mechanic required for readout of specifications.
- 2) Solenoid valve is switched briefly whilst driving, i.e. status changes from display "0" to "X" and then back to "0". Such shifting in these gears is of no relevance to operation.

Note on display group number 005, display zones 1 to 3:

- ◆ Non-switched (inactive) solenoid valves are indicated by "0", switched (active) solenoid valves by "X".

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
006	1	Specified current of pressure control valve 1 -N215	Whilst driving1)		- Refer to fault table, fault codes 18222 / P1814 and 18223 / P1815 => Page 27
				min. 0.0 A	- Perform Electrical Check => Page 123
				max 2.0 A	
	2	Specified current of pressure control valve 2 -N216	Whilst driving1)		- Refer to fault table, fault codes 18227 / P1819 and 18228 / P1820 => Page 27
				min. 0.0 A	- Perform Electrical Check => Page 123
				max 2.0 A	
Continued ▼					

- 1) Whilst driving: 2nd mechanic required for readout of specifications.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
006	3	Specified current of pressure control valve 3 -N217	Whilst driving1)		- Refer to fault table, fault codes 18232 / P1824 and 18233 / P1825 => Page 27
				min. 0.0 A	- Perform Electrical Check => Page 123
				max 2.0 A	
	4				Can be ignored at present

- 1) Whilst driving: 2nd mechanic required for readout of specifications.

**Note on specified current of solenoid valves:**

- ♦ Defective solenoid/pressure control valves or clutches or other faults may prevent a specific gear being engaged.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
007	1	ATF temperature	Refer to display group number 004, display zone 1		
	2	Specified current of pressure control valve 4 -N218	Whilst driving1)	min. 0.0 A	- Refer to fault table, fault codes 18237 / P1829 and 18238 / P1830 => Page 27
				max. 2.0 A	
	3	Torque converter clutch	Whilst driving1)	TCC disengaged	- Refer to fault table, fault code 17125 / P0741 => Page 27 - Perform Electrical Check => Page 123
				TCC regul.	
				TCC engaged	
Continued					

1) Whilst driving: 2nd mechanic required for readout of specifications.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
007	4	Torque converter slip speed	Whilst driving1)	TCC disengaged	- Check ATF level => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Checking/changing ATF 27
				TCC regul. (last shift operation min. 20 s ago)	
				TCC engaged	
				0.....Stall speed	- Establish which element is defective or not activated; gearbox with selector elements => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Transmission layout Transmission layout
				20...120 rpm	
				0...20 rpm	

1) Whilst driving: 2nd mechanic required for readout of specifications.

Note:

- ♦ Test conditions for torque converter slip speeds => Next page

Test conditions for torque converter slip speeds:

- ♦ "TCC engaged": Shift operation must be over (wait at least 1 s), torque converter lock-up clutch (TCC) engaged and accelerator value constant.
- ♦ "TCC regul.": Values given apply to "regulated status" of torque converter clutch. Under unfavourable circumstances (e.g. uphill acceleration) this status is only achieved 20 s following completion of shift operation. Slip values of up to 350 rpm may be attained during this regulation phase.
- ♦ Excessive torque converter slip speeds may also be an indication of slipping clutches or non-activated selector elements.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
008	1	Kickdown switch -F8	Kickdown Actuated 2)	Kickdown	- Check kickdown switch; perform Electrical Check => Page 123
			Not actuated	-	
	2	Throttle valve value/value from accelerator position sender	Stationary Idling speed	0...1 %	% value increases constantly on accelerating from idle to full throttle - Refer to fault table, fault code 18269 / P1861 => Page 27 Refer also to display group number 002, display zone 2
			Full throttle	99...100 %	
	3	Overrun/"under acceleration" signal	Whilst driving 1) Overrun	Overrun	Downhill travel or deceleration (engine brake)
			"Under acceleration"	-	Normal driving, engine supplying power

1) Whilst driving: 2nd mechanic required for readout of specifications.

2) Actuate kickdown means that accelerator pedal must be floored. "100 %" must appear simultaneously in display zone 2.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
009	1	Engine torque 2)	Whilst driving 1)	...Nm	- Refer to fault table, fault code 18265 / P1857 => Page 27
Continued ▼	2	Engine speed	With engine running	approx. 0...8200 rpm	- Refer to fault table, fault code 17968 / P1560 => Page 27

1) Whilst driving: 2nd mechanic required for readout of specifications.

2) Whilst driving in gear, a constant shift torque is displayed as engine torque reduction is not necessary.

Note on display zone 1:

Actual engine torque signal is transmitted from engine control unit via CAN bus wire to gearbox control unit.



Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
009	3	Throttle valve value/value from accelerator position sender	Stationary Idling speed	0...1 %	% value increases constantly on accelerating from idle to full throttle
			Full throttle	99...100 %	- Refer to fault table, fault code 18269 / P1861 => Page 27
	4 2)	Gearbox input torque	Whilst driving1)	... Nm	Refer also to display group number 002, display zone 2 Behaviour similar to display zone 1, can however be ignored at present

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1) Whilst driving: 2nd mechanic required for readout of specifications.

2) This display zone only appears as of Model Year 2000 (May 1999).

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
010	1	Torque increase in torque converter	Whilst driving1)	0...3.2	Calculated from torque converter slip speed by gearbox control unit
	2	Engine speed	With engine running	approx. 0...8200 rpm	- Refer to fault table, fault code 17968 / P1560 => Page 27
	3	Gear engaged	Refer to display group number 001, display zone 4		
	4 2)	Vehicle actual acceleration	Whilst driving1)	-10 m/s ²	Can be ignored at present

1) Whilst driving: 2nd mechanic required for readout of specifications.

2) This display zone only appears as of Model Year 2000 (May 1999).

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
011	1	Selector lever position	Refer to display group number 004, display zone 2		
	2	Tiptronic switch -F189	Selector lever in Tiptronic gate	M-switch	- Perform Electrical Check => Page 123
			Selector lever not in Tiptronic gate	-	
	3	Tiptronic switch -F189 (change-up/change-down)	Selector lever in Tiptronic gate and select gears Change-up function 1)	Change-up	- Perform Electrical Check => Page 123

			Change-down function 2)	Change-down	
--	--	--	-------------------------	-------------	--

- 1) Change-up (+) must be actuated by tapping selector lever forwards. On vehicles with Tiptronic sports steering wheel, change-up must be actuated by additionally tapping upper left/right button (+) on steering wheel.
- 2) Change-down (-) must be actuated by tapping selector lever to rear. On vehicles with Tiptronic sports steering wheel, change-down must be actuated by additionally tapping lower left/right button (-) on steering wheel.

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
012	1	Driving mode, load	Driving without load, e.g. on the flat	E	Can be ignored at present
			Driving under load, e.g. uphill	B	
	2	Driving dynamics index	Calculated from motion resistance index and driving style factor	0...256	
	3	Motion resistance index	Required for calculation of driving dynamics index	0...256	
	4	Driving style factor	Required for calculation of driving dynamics index	0...256	

Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
013 1)	1	CAN bus Standardisation torque	Stationary with ignition switched on	... Nm	Can be ignored at present
	2	CAN bus Engine index		0 ... 63	- Refer to fault table, fault codes 18157 / P1749 and 18249 / P1841 => Page 27
	3	CAN bus Gearbox index		1	- Check engine control unit encoding
	4	CAN bus Software version index		0 ... 63	- Refer to fault table, fault code 18263 / P1855 => Page 27

- 1) This display group number only appears as of Model Year 2000 (May 1999).

Note on display group number 013:

- ♦ Display zones 2 and 4: On engine control unit replacement, the same display as for the old control unit must appear following installation of the new control unit. If this is not the case, either the wrong engine control unit has been fitted or it has been incorrectly encoded.

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Display group number	Display zone	Designation	Test conditions	Display on VAS 5051/ specification	Measures if reading does not match specification
125	1	Reception of engine message via CAN bus	Whilst driving 1) Reception	1	- Refer to fault table, fault code 18258 / P1850 => Page 27



			No reception	0 2)	- Perform Electrical Check => Page 123
	2	Reception of ABS message via CAN bus	Whilst driving 1) Reception	1	- Refer to fault table, fault code 18259 / P1851 => Page 27
			No reception	0 2)	- Perform Electrical Check => Page 123

1) Whilst driving: 2nd mechanic required for readout of specifications.

2) If "0" is displayed and no fault has been entered in fault memory, the corresponding control unit has no CAN capability (or is defective).

18 - Function of CAN bus

18.1 - Function of CAN bus

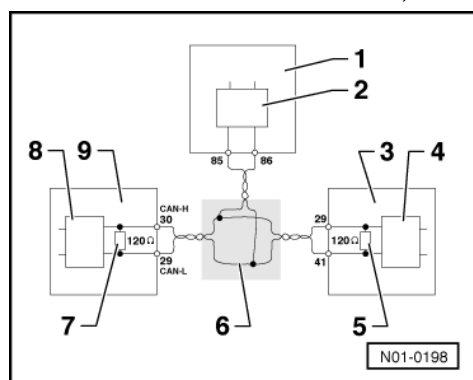
Bus:

Bus is the term used to describe a data transfer and distribution system.

CAN:

The Controller Area Network is a two-wire bus system. The wires are referred to as bus wires. Data are transferred serially to the connected control units by way of the bus wires.

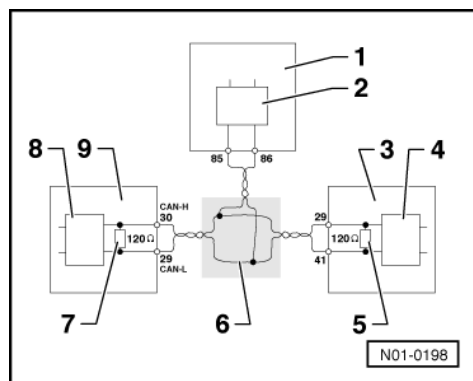
These control units communicate, i.e. exchange data, by way of the CAN bus.



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-> Design of drive data bus

- 1 - Automatic gearbox control unit -J217
- 2 - BUS driver
- 3 - Motronic control unit -J220
- 4 - BUS driver
- 5 - Terminating resistor



- 6 - Drive data bus
(CAN bus,
twisted-pair wire)
- 7 - Terminating resistor
- 8 - BUS driver
- 9 - ABS with EDL control unit -J104

18.2 - Testing "two-wire bus system"

If fault table indicates that bus should be checked:

- Use appropriate current flow diagram to establish how many control units communicate with one another via the bus.
- Press key 0 twice for "Automatic test sequence" function.

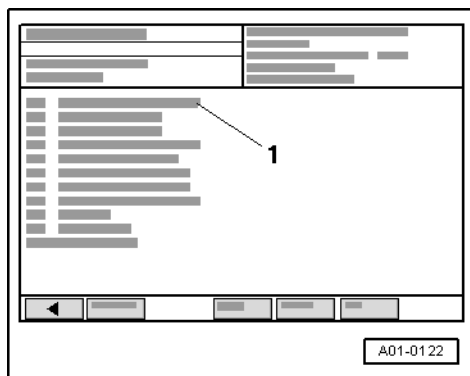
Before examining bus wires, make sure there are no malfunctions in any of the control units connected to the bus.

Malfunction will interfere with communication with other control units.

Is there a malfunction?

Start by rectifying this.

- Note down faults and erase fault memories of all control units => Interrogating and erasing fault memory of appropriate control unit.



-> Display on VAS 5051:

- Select diagnosis function "06 - End of output" in list => Page 80 .
- Repair malfunctions using fault table in appropriate Workshop Manuals.

After rectifying all malfunctions:

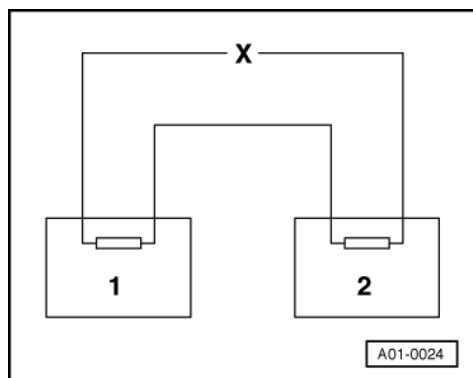
- Examine bus wires if there are still problems with control unit communication.

A distinction must be made between two situations when performing bus wire fault-finding:

- ◆ Two control units communicating by way of a "two-wire bus system"
- ◆ Three or more control units communicating by way of a "two-wire bus system"

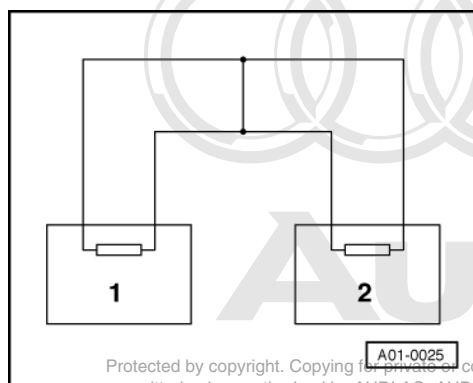
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Communication between two control units by way of a "two-wire bus system"



- Switch off ignition.
- -> Unplug the two control units.
- Check for open circuit in one of the bus wires.

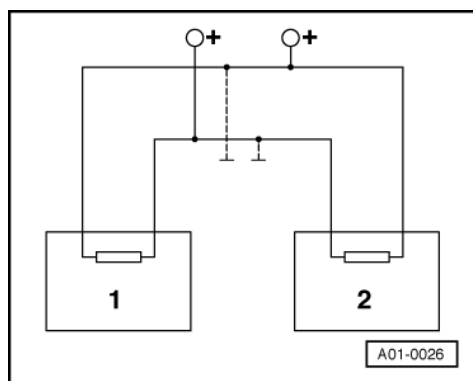
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder



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- -> Check for mutual short circuit in bus wires

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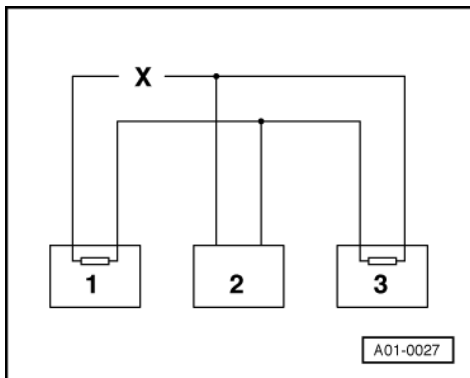
- -> Check for short to positive/earth in one of the bus wires.

Communication between three or more control units by way of a "two-wire bus system"

- Assess faults stored in control units.

Example 1:

Faults entered in fault memories reveal that control unit 1 has no link with control units 2 and 3.



Control unit	Faults entered 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

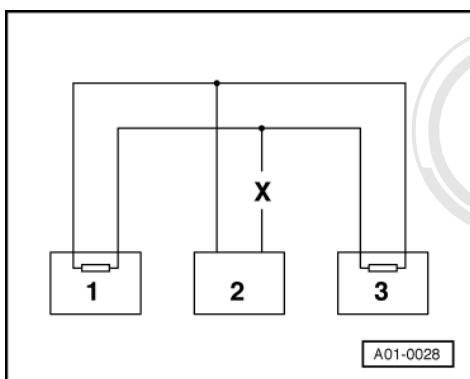
- Switch off ignition.
- Disconnect control units linked by bus wires and examine bus wires for open circuit.

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- Replace control unit 1 if no faults are found in bus wires.

Example 2:

Faults entered in fault memories reveal that control unit 2 has no link with control units 1 and 3.



Control unit	Faults entered 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

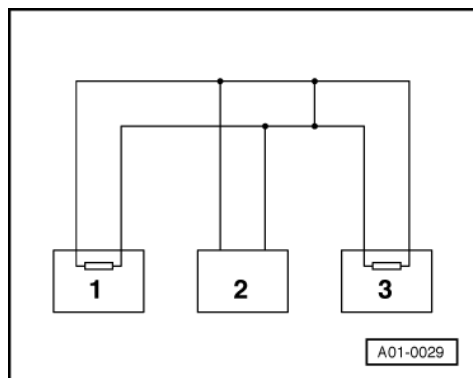
- Switch off ignition.
- Disconnect control units linked by bus wires and examine bus wires for open circuit.

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- Replace control unit 2 if no faults are found in bus wires.

Example 3:

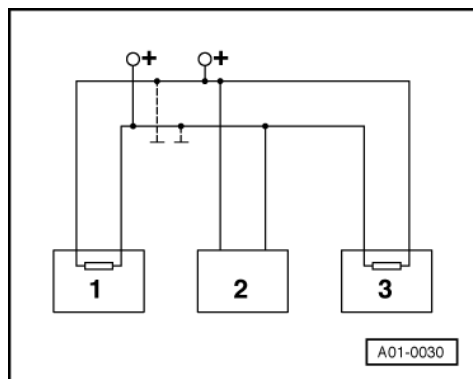
Faults entered in fault memory reveal that none of the control units can transmit or receive.



Control unit	Faults entered in fault memory
1	- Hardware defective
2	- Hardware defective
3	- Hardware defective

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- Switch off ignition.
- -> Disconnect control units linked by bus wires and examine bus wires for mutual short circuit.



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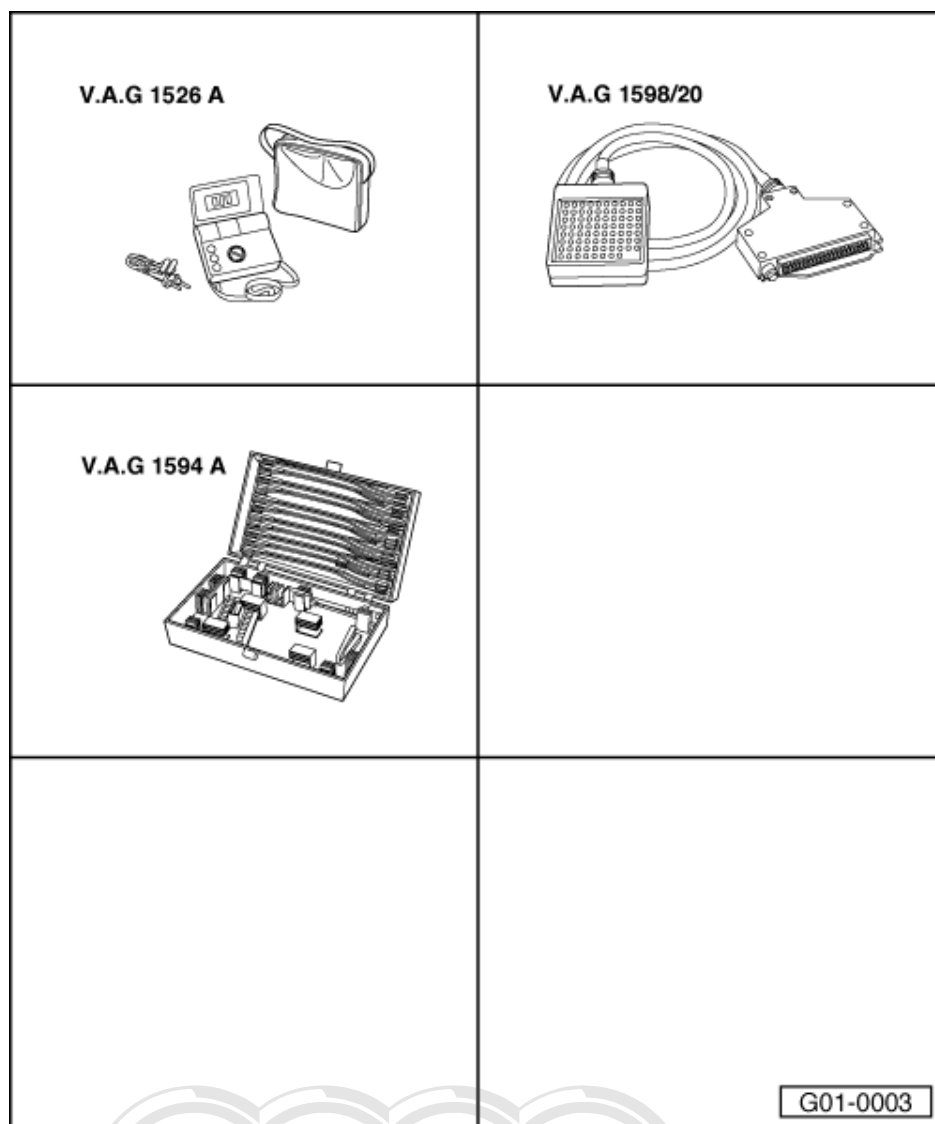
- -> Examine bus wires for short to positive/earth.
- If no faults are found in bus wires: Check whether one of the control units is responsible for a mutual short circuit between the bus wires or for short to positive/earth.

Consecutively disconnect each of the control units linked by the bus wires and check whether "Hardware defective" fault has been eliminated.

If this is the case, replace control unit currently disconnected. If this is not the case, re-connect control unit and disconnect the next control unit linked by the bus wires.

19 - Electrical check

19.1 - Electrical check



The following special tools and testers are required for this work:

- ◆ Portable 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

Additional information material required

- ◆ Workshop Manual Audi A4, Automatic Gearbox 01V Front and Four-wheel Drive
- ◆ Binder: "Current Flow Diagrams, Electrical Fault-finding and Fitting Locations"

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- Notes:**
- ◆ Use is to be made of portable multimeter V.A.G 1526A for testing. The tables indicate the measurement modes to be set in each case before taking the corresponding measurements.
 - ◆ The specifications listed apply to an ambient temperature of 0 °C to 40 °C.
 - ◆ Use current flow diagram to establish fault if readings do not match specifications.



- ♦ If measured values only differ slightly from specifications, clean sockets and connectors of testers and test leads and repeat test. Check wiring and connections before replacing components. Repeat resistance measurement at component, particularly in the case of specifications below 10 ω .
- ♦ Use test box V.A.G 1598/20 for connection of testers.
- ♦ Contact numbers of connector coincide with socket numbers of test box V.A.G 1598/20 => Page 124 .
- ♦ Checking of multi-function switch does not require connection of test box V.A.G 1598/20, as checking is first performed at connector of multi-function switch => Page 139 .

Attention:

So as not to destroy electronic components, select required measuring range on measuring instrument before connecting test leads.

Test requirements

- Battery voltage OK
- Fuses for gearbox control unit OK

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

- Fuses for component to be checked OK

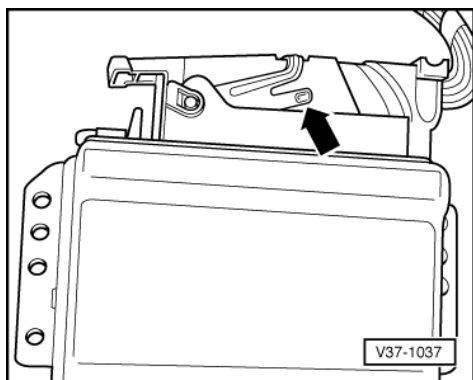
Fuse box is located behind a cover on the side of the dash panel insert.

- Earth connections OK

Check battery earth strap and earth strap between body and gearbox.

Check earth connections for gearbox control unit.

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- -> For all test steps, switch off ignition, unplug multi-pin connector from automatic gearbox control unit -J217 (control unit is located in front of right seat beneath cover in footwell => Page 3) and connect test box V.A.G 1598/20 to wiring harness connector.
- If readings do not match specifications, perform "Measures to be taken if reading does not match specification" as listed on right of test table=>Page 127 .
- Perform all measures listed in column "Measures to be taken if reading does not match specification".
- Only perform test steps recommended in fault table (specific testing).

Multi-pin connector (88-pin) of automatic gearbox control unit -J217 (sockets on V.A.G 1598/20)

1- Solenoid valve 5 -N92	18- Kickdown switch -F8 (not with electronic throttle and V6-TDI)
2- Selector lever lock solenoid -N110	19- Gearshift by ABS control unit
3- Not used	20- Engine intervention (ignition point adjustment) 1)
4- Solenoid valve 7 -N94	21- Gearbox oil temperature sender -G93 (ATF)

5- Solenoid valve 4 -N91	22- Gearbox oil temperature sender -G93 (ATF)
6- Earth for loads (terminal 31)	23- Gearbox input speed sender -G182 (screen)
7- Not used	24- Not used
8- Multi-function switch -F125 L2	25- Selector lever position indicator (not for highline dash panel insert)
9- Multi-function switch -F125 L4; supply voltage for cruise control system	26- Supply voltage (terminal 30), with or without fuse depending on design status => 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
13- Tiptronic recognition	30- Solenoid valve 1 -N88
14- Gearbox speed sender -G38	31- Not used
15- Gearbox speed sender -G38 (screen)	32- Solenoid valve 3 -N90
16- Gearbox input speed sender -G182	33- Solenoid valve 2 -N89
17- Signal for fault display (OBD II requirement) 1) 2)	34- Earth for loads (terminal 31)

Notes and footnotes on assignment of multi-pin connector => Page 126

35- Fuel consumption signal (engine actual 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 signal 1)	-
41- Throttle valve value (load signal) 1)	-
42- Gearbox speed sender - G38	-
43- Not used	-
44- Gearbox input speed sender -G182	- Sockets 57 - 83 not used
45- Not used	-
46- Tiptronic change-up	-
47- Tiptronic change-down	-
48- Not used	-
49- Not used	84- Not used
50- Not used	85- CAN bus 3)
51- Change-up/change-down signal (for engine intervention) 1)	86- CAN bus 3)
52- Supply voltage for solenoid valves	87- Not used
53- Supply voltage for solenoid valves	88- Diagnosis K-wire



Notes and footnotes on assignment of multi-pin connector => Page 126

Notes and footnotes on assignment of multi-pin connector

1) Vehicles with no CAN bus only

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

2) Signal is transmitted via engine control unit to gearbox control unit and can only be checked in measured value block => Page 84 .

3) Vehicles with CAN bus only. For further information on CAN bus, refer to => Page 118

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

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4) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

List of test steps (88-pin connector)

Only perform test steps from fault table and measured value block listed according to component.

Component checked		Component checked	
Automatic gearbox control unit -J217 supply voltage	- Perform test steps 1 and 7	Solenoid valve 5 -N92 (pressure control valve 2 - N216)	- Perform test steps 13 and 8
Selector lever lock solenoid -N110	- Perform test steps 2, 6 and 16	Solenoid valve 6 -N93 (pressure control valve 3 - N217)	- Perform test steps 14 and 8
Brake light switch -F	- Perform test step 3	Solenoid valve 7 -N94 (pressure control valve 4 - N218)	- Perform test steps 15 and 8
Supply voltage for cruise control system	- 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)	- Perform test steps 5 and 17	Gearbox input speed sender -G182	- Perform test step 19
Multi-function switch (driving range sensor) - F125	- Page => 139	Gearbox oil temperature sender -G93 (ATF)	- Perform test step 20
Solenoid valve 1 -N88	- Perform test steps 8 and 9	Wiring to engine control unit 1)	- Perform test steps 21, 22, 23, 24 and 25
Solenoid valve 2 -N89	- Perform test steps 10 and 8	Tiptronic switch -F189	- Perform test steps 26 and 27
Solenoid valve 3 -N90	- Perform test steps 11 and 8	CAN bus 2)	- Test step 28 and check bus system => Page 119
Solenoid valve 4 -N91 (pressure control valve 1 - N215)	- Perform test steps 12 and 8		

1) Signal is transmitted via engine control unit to gearbox control unit (checking for vehicles with no CAN bus only)

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

2) Checking for vehicles with CAN bus only

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

19.2 - Test table

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
1	55 + 34 55 + 6 54 + 28 1)	Automatic gearbox control unit -J217 supply voltage	▪ Ignition on	approx. battery voltage	- Use current flow diagram to check wiring Check wiring from contact 6, 34 or 28 to earth Check wiring from contact 54 or 55 to terminal 15 (central electrics)
	54 + 55			0 V	
	26 + 6 26 + 34	Electrical system voltage/term. 30 from control unit -J217	▪ Ignition off	approx. battery voltage	- Use current flow diagram to check wiring
2	2 + 6	Selector lever lock solenoid -N110 2)	▪ Ignition on	approx. battery voltage	- Use current flow diagram to check wiring Check multi-function switch -F125 for short circuit Check selector lever lock solenoid -N110 for short circuit Perform test steps 6 and 16

1) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

2) Selector lever lock solenoid -N110 is also referred to as "selector lever lock => solenoid -N110".

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
3 1) Not for	10 + 6 10 + 28 2)	Brake light switch -F	▪ Ignition on ▪ Brake pedal not pressed	Less than 1 V	- Use current flow diagram to check wiring Replace and adjust brake light switch -F



V6-TDI and engines with electronic throttle			- Brake pedal pressed	approx. battery voltage	=> Running Gear, Front-wheel Drive and Four-wheel Drive; Repair Group 47; Exploded View: Pedal cluster, brake pedal
4	9 + 6 9 + 28 2)	Supply voltage for cruise control system control unit -J213	▪ Ignition on ▪ Selector lever set to "D", "4", "3"	approx. battery voltage	- Check wiring from contact 6 or 28 to earth Check wiring from contact 9 to terminal 15 (central electrics)
			▪ Selector lever set to "P", "R", "N", "2"	Less than 5 V	- Check wiring to cruise control system control unit -J213 Check multi-function switch - F125 => Page 139 Check fuse 31

1) This check cannot be performed for 6-cyl. TDI engines and vehicles with electronic throttle. Signal is transmitted by brake light switch or brake test switch to engine control unit, which relays signal via CAN bus to gearbox control unit.

2) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
5 1) Not for V6-TDI and engines with electronic throttle	18 + 54	Kickdown switch -F8	▪ Ignition on Floor accelerator pedal as far as kickdown	approx. battery voltage	- Use current flow diagram to check wiring Adjust/replace accelerator cable => Fuel Supply System - Petrol Engines; Repair Group 20; Servicing Accelerator Mechanism - Front and four-wheel drive Servicing Accelerator Mechanism - Front and four-wheel drive Perform test step 17

1) This check cannot be performed for 6-cyl. TDI engines and vehicles with electronic throttle. In this case, kickdown switch -F8 is integrated into accelerator position sender (-G79, -G185).

Select measuring range: Resistance measurement

Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
6	2 + 54 2 + 55	Selector lever lock solenoid -N110 1)	▪ Ignition off	14 to 28 ω	- Use current flow diagram to check wiring Check multi-function switch -F125 => Page 139 Check selector lever lock solenoid -N110 for short circuit Perform test steps 2 and 16

1) Selector lever lock solenoid -N110 is also referred to as "selector lever lock => solenoid -N110".

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
7	6 + 34 1) 28 + 34	Earth connections of automatic gearbox control unit -J217	▪ Ignition off	Less than 1 ω	- Use current flow diagram to check wiring
	34 + earth to battery			Less than 1 ω	
8	52 + 53	Solenoid valve wiring	▪ Ignition off	Less than 1.5 ω	- Use current flow diagram to check wiring Check control unit wiring to 16-pin connector => Page 137 Perform test step 1 Use current flow diagram to check wiring harness in gearbox

1) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
9	52 + 30	Solenoid valve 1 -N88	▪ Ignition off	25 to 35 ω	- Check 16-pin connector to gearbox for contact corrosion - Perform test step 8
	30 + 34			Infinity ω 1)	
10	52 + 33	Solenoid valve 2 -N89	▪ Ignition off	25 to 35 ω	- Check wiring from 88-pin control unit to 8-pin connector => Page 137 - Use current flow diagram to check wiring harness in gearbox and replace if necessary
	33 + 34			Infinity ω 1)	
11	52 + 32	Solenoid valve 3 -N90	▪ Ignition off	25 to 35 ω	- Remove and install valve body => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing valve body
	32 + 34			Infinity ω 1)	
12	52 + 5	Solenoid valve 4 -N91 2)	▪ Ignition off	6 to 8 ω	



	5 + 34			Infinity ω1)	
--	--------	--	--	-----------------	--

- 1) Switch V.A.G 1526 to maximum ω range
- 2) Solenoid valve 4 -N91 is also referred to as pressure control valve 1 -N215.

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
13	52 + 1	Solenoid valve 5 -N92 2)	▪ Ignition off	6 to 8 ω	- Check 16-pin connector to gearbox for contact corrosion - Perform test step 8
	1 + 34			Infinity ω1)	
14	52 + 29	Solenoid valve 6 -N93 3)	▪ Ignition off	6 to 8 ω	- Check wiring from 88-pin control unit to 8-pin connector => Page 137 - Use current flow diagram to check wiring harness in gearbox and replace if necessary
	29 + 34			Infinity ω1)	
15	52 + 4	Solenoid valve 7 -N94 4)	▪ Ignition off	6 to 8 ω	- Remove and install valve body => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing valve body
	4 + 34			Infinity ω1)	

- 1) Switch V.A.G 1526 to maximum ω range
- 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.

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification

16	2 + 36	Selector lever lock solenoid - N110 3)	▪ Ignition off - Selector lever set to "P"	14 to 28 ω	- Use current flow diagram to check wiring - Check multi-function switch - F125 => Page 139 - Perform test steps 2 and 6 - Replace selector lever lock solenoid -N110 => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism - Servicing shift mechanism
17 2) Not for V6-TDI and engines with electronic throttle	18 + 34	Kickdown switch -F8	▪ Ignition off ▪ Accelerator pedal not pressed	Infinity ω 1)	- Use current flow diagram to check wiring - Adjust/replace accelerator cable
			- Floor accelerator pedal as far as kickdown	Less than 1.5 ω	=> Fuel Supply System - Petrol Engines; Repair Group 20; Servicing Accelerator Mechanism - Front and four-wheel drive

- 1) Switch V.A.G 1526 to maximum ω range
- 2) This check cannot be performed for 6-cyl. TDI engines and vehicles with electronic throttle. In this case, kickdown switch -F8 is integrated into accelerator position sender (-G79, -G185).
- 3) Selector lever lock solenoid -N110 is also referred to as "selector lever lock => solenoid -N110".

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
18	14 + 42	Gearbox speed sender - G38 2)	▪ Ignition off min. _____ max. _____	0.8 kw	- Use current flow diagram to check wiring
	14 + 34			1.2 kw	
	14 + 54			Infinity ω 1)	- Replace gearbox speed sender -G38 =>Page 18 , Fig. 10
	42 + 54 42 + 34				
	15 + 34 15 + 54	Screen of -G38	▪ Ignition off	Infinity ω 1)	- Use current flow diagram to check wiring

- 1) Switch V.A.G 1526 to maximum ω range
- 2) Gearbox speed sender -G38 is also referred to as gearbox output speed sender -G195.



Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
19 Only for hydr. control E17 2)	16 + 44	Gearbox input speed sender -G182	▪ Ignition off min. _____ max. _____	0.23 kW	- Use current flow diagram to check wiring - Replace gearbox input speed sender -G182 => Page 17 Fig. 11
				0.30 kW	
	44 + 34 44 + 54 16 + 54 16 + 34			Infinity ω1)	
	23 + 34 23 + 54	Screen of -G182	▪ Ignition off	Infinity ω1)	- Use current flow diagram to check wiring

1) Switch V.A.G 1526 to maximum ω range

2) This test step can only be performed for gearboxes with hydraulic control E17. Information as to which gearbox is concerned can be found in the following Workshop Manual in the Repair Group given:

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
20	21 + 22	Gearbox oil temperature sender -G93 (ATF)	▪ Ignition off ▪ ATF temperature approx. 20°C approx. 60°C approx. 120°C		- Check wiring from 88-pin control unit to 8-pin connector => Page 137 - Check wiring harness in gearbox and replace if necessary - G93 is integrated into wiring harness (in gearbox)
				approx. 0.83 kW2) approx. 1.28 kW2) approx. 1.88 kW2)	
	21 + 34 22 + 28 3)		▪ Ignition off	Infinity ω1)	- Remove and install valve body => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing valve body
	21 + 54 22 + 54			Infinity ω1)	

1) Switch V.A.G 1526 to maximum ω range

2) Permissible tolerance: ± 0.1 kW

3) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

Select measuring range: Resistance measurement
--

Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
21 A)	41 + 28 3) 41 + 34 41 + 55 41 + 26	Wiring to engine control unit (throttle valve signal)	▪ Ignition off ▪ Engine control unit disconnected	Infinity $\omega 1$)	- Use current flow diagram to check wiring
	41 + xx 2)			Less than 1.5 ω	

1) Switch V.A.G 1526 to maximum ω range

2) Corresponding engine control-unit contact assignment

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

A) Signal is transmitted via engine control unit to gearbox control unit (checking for vehicles with no CAN bus only)

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

3) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
22 A)	35 + 28 1) 35 + 34 35 + 55 35 + 26	Wiring to engine control unit (fuel consumption/load signal)	▪ Ignition off ▪ Engine control unit disconnected	Greater than 40 kw	- Use current flow diagram to check wiring Unplug connectors to components (which also receive this signal) and repeat measurement - Check these components for short circuit if applicable (e. g. on-board computer) => Electrical System; Repair Group 01; Self-diagnosis of dash panel insert
	35 + xx 2)			Less than 1.5 ω	
	35 + 34 35 + 28 1)			Select measuring range: Voltage measurement $\geq 5 \text{ V}$	

1) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

2) Corresponding engine control-unit contact assignment

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

A) Signal is transmitted via engine control unit to gearbox control unit (checking for vehicles with no CAN bus only)



=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
23 A)	40 + 28 3) 40 + 34	Wiring to engine control unit (engine speed signal)	- Ignition off - Engine control unit disconnected	15 ... 80 kW	- Use current flow diagram to check wiring Check on-board computer
	40 + xx 2)			Less than 1.5 Ω	=> Electrical System; Repair Group 01; Self-diagnosis of dash panel insert
24 A)	20 + 28 3) 20 + 34 20 + 55 20 + 26	Wiring to engine control unit (engine intervention)	- Ignition off - Engine control unit disconnected	Infinity ω1)	- Use current flow diagram to check wiring
	20 + xx 2)			Less than 1.5 Ω	

1) Switch V.A.G 1526 to maximum ω range

2) Corresponding engine control-unit contact assignment

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

A) Signal is transmitted via engine control unit to gearbox control unit (checking for vehicles with no CAN bus only)

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

3) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
25 A)	51 + 28 3) 51 + 34 51 + 55 51 + 26	Wiring to engine control unit (change-up/change-down signal)	- Ignition off - Engine control unit disconnected	Infinity ω1)	- Use current flow diagram to check wiring

	51 + xx 2)			Less than 1.5 ω	
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1) Switch V.A.G 1526 to maximum ω range

2) Corresponding engine control-unit contact assignment

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

A) Signal is transmitted via engine control unit to gearbox control unit (checking for vehicles with no CAN bus only)

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

3) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
26	13 +34 13 + 6	Tiptronic switch -F189	▪ Ignition on Selector lever set to D, but not in Tiptronic gate	approx. 10 V	- Use current flow diagram to check wiring Check magnet on side of transverse slide 1)
			▪ Ignition on Selector lever in Tiptronic gate	approx. 20 mV	- Service shift mechanism, if necessary replace masking panel or printed circuit board with Tiptronic switch - F189 1) => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism Perform test step 29

1) Tiptronic switch -F189 is integrated into printed circuit board of symbol panel, which is located in the shift mechanism cover. In the event of faults in the Tiptronic switch, start by checking that magnet fitted to side of transverse slide of masking panel is firmly attached. If this is not the case, masking panel must be replaced. If magnet is properly attached and wiring is OK, symbol panel with integrated printed circuit board must be replaced.

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification



27	46 + 54 46 + 55	Change-up/ change-down po- sition for Tiptronic switch -F189	▪ Ignition on Selector lever in Tiptronic gate	Less than 1.5 V	Change-up/ change-down po- sition enables driver to engage required gear manually. 2)
			▪ Ignition on Selector lever in Tiptronic gate and change-up po- sition actuated	approx. battery voltage	
	46 + 34 46 + 6		▪ Ignition on Selector lever set to D Selector lever in Tiptronic gate Selector lever in Tiptronic gate and change-down po- sition actuated	approx. 12 V	- Check magnet on side of trans- verse slide 1) Service shift mechanism, if necessary re- place masking panel or printed circuit board with Tiptronic switch - F189 1)
			▪ Ignition on Selector lever in Tiptronic gate and change-up po- sition actuated	approx. 15 mV	=> Automatic Gearbox 01V Front and Four- wheel Drive; Re- pair Group 37; Servicing shift mechanism Perform test step 28
Continued ▼					

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
Continuation of 27	47 + 34 47 + 6	Change-up/ change-down position for Tiptronic switch -F189	▪ Ignition on Selector lever set to D Selector lever in Tiptronic gate Selector lever in Tiptronic gate and change-up position actuated	approx. 12 V	Change-up/ change-down position enables driver to engage required gear manually. 2) Use current flow diagram to check wiring including wiring to Tiptronic steering wheel if applicable.
	▪ Ignition on Selector lever in Tiptronic gate and change-down position actuated		approx. 15 mV	- Check magnet on side of transverse slide 1)	
	47 + 54 47 + 55		▪ Ignition on Selector lever in Tiptronic gate	Less than 1.5 V	- Service shift mechanism, if necessary replace masking panel or printed circuit board with Tiptronic switch - F189 1)

Continued ▼			▪ Ignition on Selector lever in Tiptronic gate and change-down position actuated	approx. bat- tery voltage	=> Automatic Gearbox 01V Front and Four- wheel Drive; Re- pair Group 37; Servicing shift mechanism Perform test step 28
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Refer to next page for notes and footnotes on test step 29.

1) Tiptronic switch -F189 is integrated into printed circuit board of symbol panel, which is located in the shift mechanism cover. In the event of faults in the Tiptronic switch, start by checking that magnet fitted to side of transverse slide of masking panel is firmly attached. If this is not the case, masking panel must be replaced. If magnet is properly attached and wiring is OK, symbol panel with integrated printed circuit board must be re-placed.

2) When selector lever is in Tiptronic gate, manual change-down can be implemented by tapping selector lever to rear (-) or -on vehicles with Tiptronic sports steering wheel - by pressing one of the minus (-) buttons on the steering wheel (change-down position). Manual change-up can be implemented by tapping selector lever forwards (+) or - on vehicles with Tiptronic sports steering wheel - by pressing one of the plus (+) buttons on the steering wheel (change-up position).

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional work	Specification	Measures if read- ing does not match specifica- tion
28 A)	85 + 28 3) 85 + 34 86 + 28 3) 86 + 34	Wiring from gearbox to en- gine control unit (CAN bus)	▪ Ignition off ▪ Engine control unit dis- connected	Infinity ω1)	- Use current flow diagram to check wiring
	85 + xx2) 86 + xx2)			Less than 1.5 ω	Description of CAN bus wiring continued => Page 118

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1) Switch V.A.G 1526 to maximum ω range

2) Corresponding engine control-unit contact assignment

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

A) Checking for vehicles with CAN bus only

=> Automatic Gearbox 01V Front and Four-Wheel Drive; Repair Group 00; Code letters, assignment of mechanical units, transmission ratios, features Code letters, assignment of mechanical units, transmission ratios, features

3) Control-unit pin 28 is not used on vehicles with 10-pin connector for multi-function switch -F125.

19.3 - Checking wiring between 88-pin gearbox control unit and gearbox

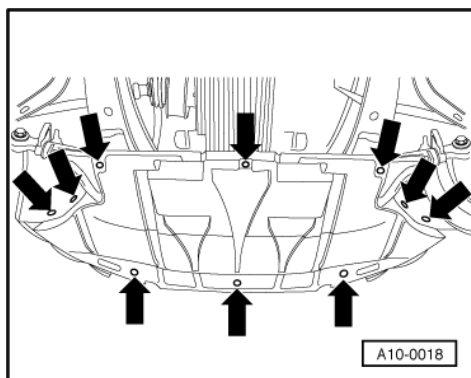
Perform check if:

- ♦ Final control diagnosis or
- ♦ Electrical check indicates faults in or between gearbox and automatic gearbox control unit -J217.

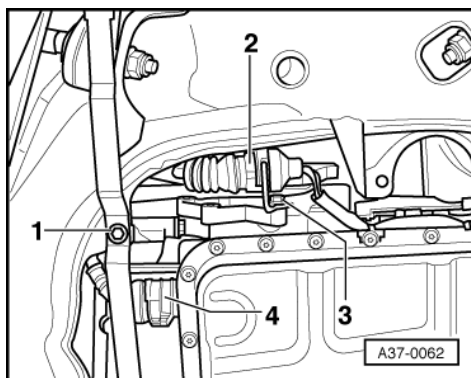


Test requirements

- ♦ Ignition off
- ♦ Only connect test box V.A.G 1598/20 to 88-pin connector of gearbox wiring harness

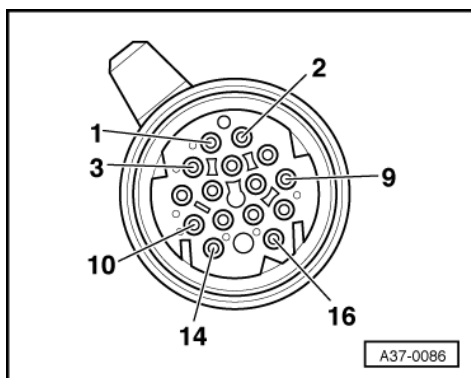


- ♦ Take measurements with test box V.A.G 1598/20 from outside vehicle
- -> Remove noise insulation.
- Remove holder -1- for noise insulation.



Checking wiring to 16-pin connector at gearbox

- -> Twist bayonet lock -4- of 16-pin connector to release from gearbox.



- -> Check for continuity in wiring by applying portable multimeter V.A.G 1526A or V.A.G 1715 between contacts of 16-pin connector and sockets of test box V.A.G 1598/20. Refer to table below for resistances



Connector contact	Test box V.A.G 1598/20, socket	Specification	Measures if reading does not match specification
1	42	$\leq 1.5 \omega$	- Use current flow diagram to eliminate open circuit in wiring Check connector for: - Contact corrosion - Ingress of water - 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	$\leq 1.5 \omega$	

Connector contact	Test box V.A.G 1598/20, socket	Specification	Measures if reading does not match specification
14	21	$\leq 1.5 \omega$	- Use current flow diagram to eliminate open circuit in wiring - Check connector
15 Contact not used	-		
16	53	$\leq 1.5 \omega$	

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Notes:

- ♦ Wiring harness in gearbox must be checked if this wiring check does not reveal any impermissible deviations

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing valve body
 Removing and installing valve body

- ♦ Corresponding solenoid valves are only to be replaced following satisfactory checking of the wiring harness in the gearbox

=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 38; Removing and installing valve body
 Removing and installing valve body

19.4 - Checking multi-function switch -F125 (driving range sensor)

Notes:

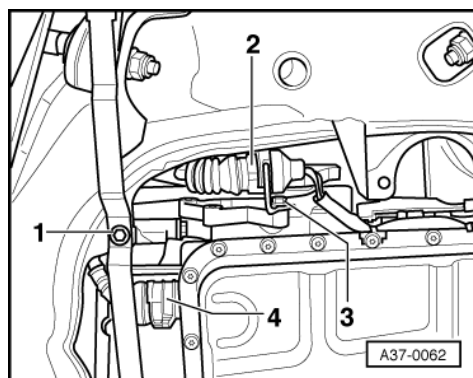
- ♦ Prior to electrical checking of multi-function switch, measured value block for multi-function switch must be checked => Page 84 , Display group number 004.
- ♦ Make sure selector lever cable is properly adjusted.

Use is made of two different multi-function switches:

1. Multi-function switch with 8-pin connector=>Checking, Page 140 onwards
2. Multi-function switch with 10-pin connector=>Checking, Page 145 onwards

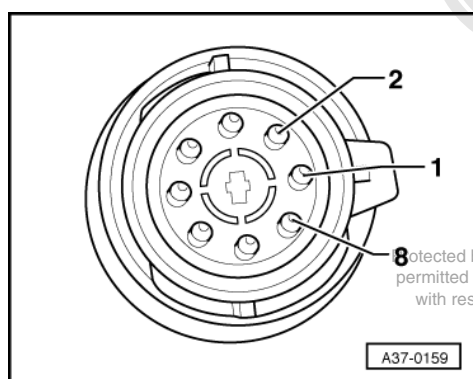


Checking for multi-function switch with 8-pin connector



1. Checking operation

- -> Remove spring clip of 8-pin connector -2- from connector to cable/multi-function switch.
- Unclip connector to multi-function switch from mount or unscrew holder together with connector from gearbox to provide better access to contacts in connector.



- -> Contact assignment at 8-pin connector of multi-function switch -F125 (to multi-function switch).
- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Checking for gearbox with 8-pin connector at multi-function switch -F125

Select measuring range: Resistance measurement					
Test step	Contacts at - F125	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
1	1 + 7 1 + 6	Multi-function switch -F125	▪ Ignition off Selector lever set to "P", "R", "N", "D", "4", "3" and "2"	Infinity ω1)	- Check connector at multi-function switch for contact corrosion, ingress of water or loose fit If necessary, adjust selector lever cable
	1 + 2		▪ Ignition off Selector lever set to "P", "N" and "D"	Less than 2ω	

Continued ▼		- Selector lever set to "R", "4", "3" and "2"	Infinity ω_1)	=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism - Replace multi-function switch - F125 => Page 18, Fig. 12
	1 + 3	▪ Ignition off Selector lever set to "R", "N" and "4"	Less than 2 ω	
		- Selector lever set to "P", "D", "3" and "2"	Infinity ω_1)	

1) Switch V.A.G 1526 to maximum ω range

Checking for gearbox with 8-pin connector at multi-function switch -F125

Select measuring range: Resistance measurement					
Test step	Contacts at -F125	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
Continuation of 1 Continued ▼	1 + 4		▪ Ignition off Selector lever set to "N", "D", "4" and "2"	Less than 5 ω	- Check connector at multi-function switch for contact corrosion, ingress of water or loose fit - If necessary, adjust selector lever cable => Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism - Replace multi-function switch - F125 => Page 18, Fig. 12
			- Selector lever set to "P", "R" and "3"	Infinity ω_1)	
	1 + 5		▪ Ignition off Selector lever set to "D", "4" and "3"	Less than 2 ω	
			- Selector lever set to "P", "R", "N" and "2"	Infinity ω_1)	
	1 + 8		▪ Ignition off Selector lever set to "R"	Less than 2 ω	
			- Selector lever set to "P", "N" "D", "4", "3" and "2"	Infinity ω_1)	

1) Switch V.A.G 1526 to maximum ω range

Checking for gearbox with 8-pin connector at multi-function switch -F125

Select measuring range: Resistance measurement					
Test step	Contacts at -F125	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
Continuation of 1	6 + 7	P/N signal of multi-function switch	▪ Ignition off Selector lever set to "R", "D", "4", "3" and "2"	Infinity ω_1)	- Replace multi-function switch - F125 => Page 18, Fig. 12

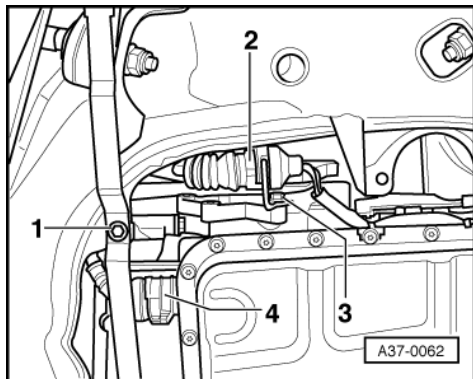


			▪ Ignition off Selector lever set to "P" "N"	Less than 2ω	P/N signal for en- gine control unit is to be checked
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1) Switch V.A.G 1526 to maximum ω range

Notes:

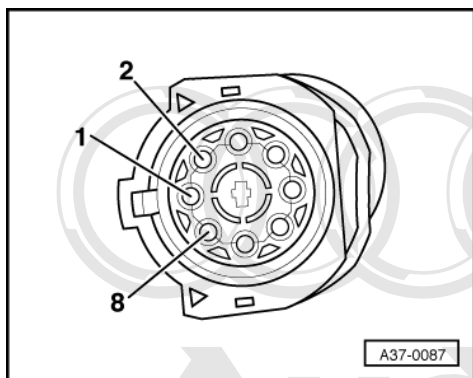
- ♦ If functional check is OK, check power supply of multi-function switch => Page 142



2. Checking power supply of 8-pin multi-function switch

- -> Remove spring clip of 8-pin connector -2- from connector to cable/multi-function switch.

Checking is performed at connector with spring clip (sockets) to gearbox control unit.



- -> Contact assignment at 8-pin connector of multi-function switch
-F125 (to gearbox control unit).
- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

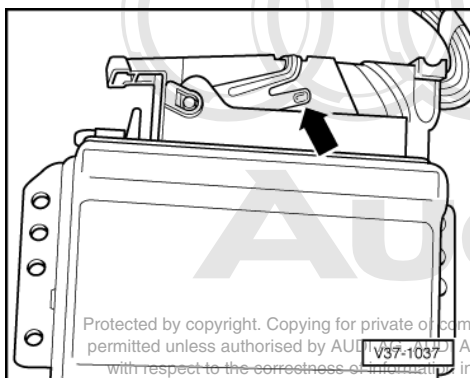
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Select measuring range: Voltage measurement		
Connector con- tacts (socket)	▪ Test condi- tions	Specification
1 + 6	▪ Ignition on	approx. battery voltage

- If readings do not match specifications, use current flow diagram to check fuses and wiring and eliminate faults.

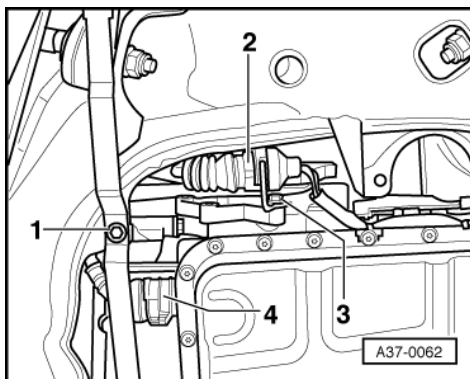
Notes:

If functional check and power supply of multi-function switch are OK, check wiring from automatic gearbox control unit -J217 to multi-function switch -F125 => Page **143**



3. Checking wiring from automatic gearbox control unit -J217 to 8-pin multi-function switch -F125

- -> For all test steps, switch off ignition, unplug multi-pin connector from automatic gearbox control unit -J217 (control unit is located in front of right seat beneath cover in footwell => Page **3**) and connect test box V.A.G 1598/20 to wiring harness connector.



- -> Connect the two 8-pin connectors -2- to multi-function switch (as illustrated).
- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Checking for gearbox with 8-pin connector at multi-function switch -F125

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
1	36 + 34 36 + 6	Multi-function switch -F125	▪ Ignition on Selector lever set to "P", "N" and "D"	approx. battery voltage	- Check connector at multi-function switch for contact corrosion
			- Selector lever set to "R", "4", "3" and "2"	Less than 1 V	- Use current flow diagram to check wiring

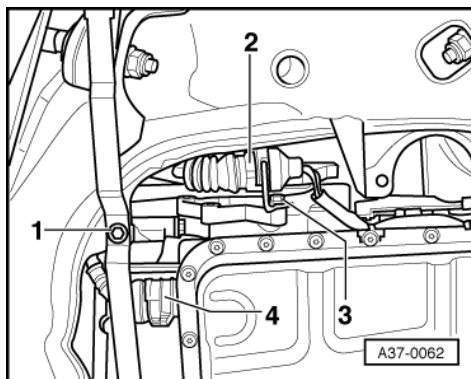
	8 + 34 8 + 6	▪ Ignition on Selector lever set to "R", "N" and "4"	approx. battery voltage	- Check fuses Check supply voltage of -F125 => Page 142 - Check wiring of control unit to 8- pin connector => Page 137
		- Selector lever set to "P", "D", "3" and "2"	Less than 1 V	
	37 + 34 37 + 6	- Selector lever set to "N", "D", "4" and "2"	approx. battery voltage	
		- Selector lever set to "P", "R" and "3"	Less than 1 V	
	9 + 34 9 + 6	- Selector lever set to "D", "4" and "3"	approx. battery voltage	
		- Selector lever set to "P", "R", "N" and "2"	Less than 1 V	

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Checking for gearbox with 8-pin connector at multi-function switch -F125

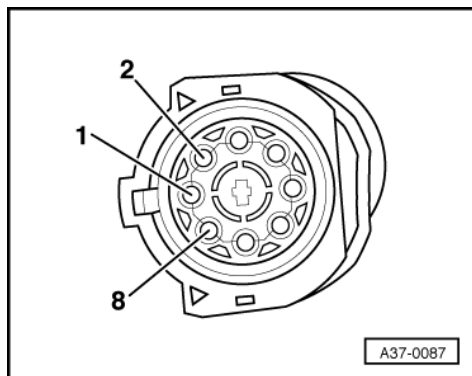
Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
2	36 + 8	Multi-function switch -F125	▪ Ignition off Selector lever set to "N"	Less than 26 ω	- Check connector at multi-function switch for contact corrosion
			- Selector lever set to "P", "R", "D", "4", "3", "2"	Infinity ω1)	- Check wiring from 88-pin control unit to 8-pin connector => Page 137
	37 + 9		▪ Ignition off Selector lever set to "D" and "4"	Less than 26 ω	- Perform test steps 6 and 27
			- Fuse 31 disconnected 2) Selector lever set to "P", "R", "N", "3" and "2"	Infinity ω1)	
	37 + 36		▪ Ignition off Selector lever set to "N" and "D"	Less than 26 ω	
			- Selector lever set to "P", "R", "4", "3" and "2"	Infinity ω1)	

- 1) Switch V.A.G 1526 to maximum ω range
- 2) Fuse for multi-function switch -F125 power supply



4. Checking wiring from automatic gearbox control unit -J217 to 8-pin connector at multi-function switch

- Switch off ignition.
- -> Remove spring clip of 8-pin connector -2- from connector to cable/multi-function switch.



- -> Contact assignment at 8-pin connector of multi-function switch
- F125 (sockets to gearbox control unit).

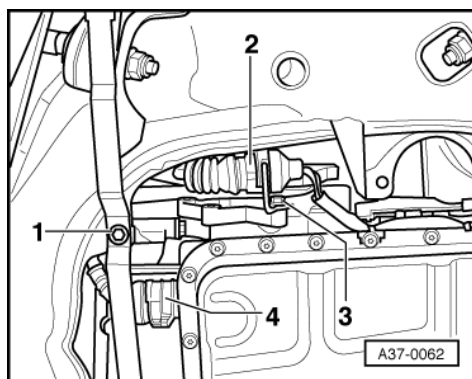
Checking is performed between 8-pin connector with spring clip (sockets) and test box V.A.G 1598/20 at control unit connector.

- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Checking for gearbox with 8-pin connector at multi-function switch -F125

Connector contact	Test box V.A.G 1598/20, socket	Specification	Measures if reading does not match specification
1	54, 55	$\leq 1.5 \, \Omega$	- Use current flow diagram to eliminate open circuit in wiring Check connector for: - Contact corrosion - Ingress of water - 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	$\leq 1.5 \, \Omega$	
7	P/N signal for engine control unit	$\leq 1.5 \, \Omega$	
8	Refer to reversing lights	$\leq 1.5 \, \Omega$	

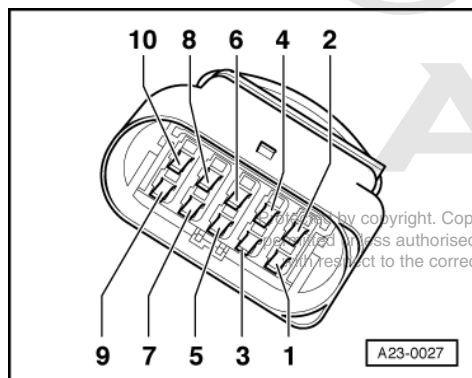
Checking for multi-function switch with 10-pin connector



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1. Checking operation

- -> Unplug 10-pin connector -2- to multi-function switch.
- Unclip connector to multi-function switch from mount or unscrew holder together with connector from gear-box to provide better access to contacts in connector.



- -> Contact assignment at 10-pin connector of multi-function switch
-F125 (to multi-function switch).
- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Checking for gearbox with 10-pin connector at multi-function switch -F125

Select measuring range: Resistance measurement					
Test step	Contacts at - F125	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
1	7 + 9 7 + 10 1 + 7 1 + 8 1 + 9 1 + 10	Multi-function switch -F125	▪ Ignition off	Infinity $\omega 1$)	- Check connector at multi-function switch for contact corrosion, ingress of water or loose fit
	1 + 2		▪ Ignition off Selector lever set to "P", "N" and "D"	Less than 2ω	If necessary, adjust selector lever cable
			- Selector lever set to "R", "4", "3", "2"	Infinity $\omega 1$)	=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism
			▪ Ignition off Selector lever set to "R", "N" and "4"	Less than 2ω	- Replace multi-function switch - F125 => Page 18, Fig. 12
Continued	1 + 3		- Selector lever set to "P", "D", "3" and "2"	Infinity $\omega 1$)	

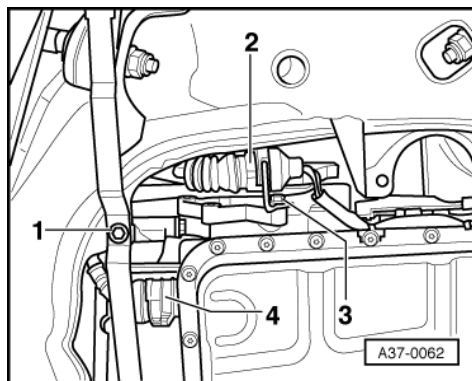
- 1) Switch V.A.G 1526 to maximum ω range

Select measuring range: Resistance measurement

Test step	Contacts at - F125	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
Continuation of 1	1 + 4		▪ Ignition off Selector lever set to "N", "D", "4" and "2"	Less than 2ω	- Check connector at multi-function switch for contact corrosion, ingress of water or loose fit
			- Selector lever set to "P", "R" and "3"	Infinity ω1)	- If necessary, adjust selector lever cable
	1 + 5		▪ Ignition off Selector lever set to "D", "4" and "3"	Less than 2ω	=> Automatic Gearbox 01V Front and Four-wheel Drive; Repair Group 37; Servicing shift mechanism
			- Selector lever set to "P", "R", "N" and "2"	Infinity ω1)	
	9 + 10		▪ Ignition off Selector lever set to "P", "N"	Less than 2ω	- Replace multi-function switch - F125 => Page 18 , Fig. 12
			- Selector lever set to "R", "D", "4", "3" and "2"	Infinity ω1)	
	8 + 7		▪ Ignition off Selector lever set to "R"	Less than 2ω	
			- Selector lever set to "P", "4" "3" "2", "N" and "D"	Infinity ω1)	

1) Switch V.A.G 1526 to maximum ω range

- ♦ If functional check is OK, check power supply of multi-function switch => Page 142

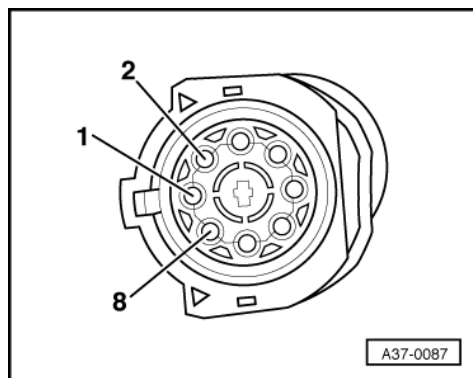


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2. Checking power supply of 10-pin multi-function switch

- -> Unplug 10-pin connector -2- to multi-function switch.

Checking is performed at connector (sockets) to gearbox control unit.



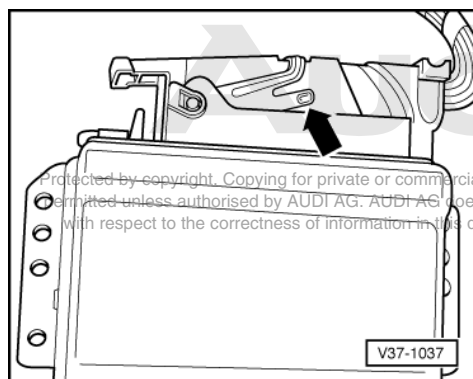
- -> Contact assignment at 10-pin connector of multi-function switch
- F125 (sockets to gearbox control unit).
- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Select measuring range: Voltage measurement		
Connector con- tacts (socket)	Test condi- tions	Specification
1 + 10 7 + 10	▪ Ignition on	approx. battery voltage

- If readings do not match specifications, use current flow diagram to check fuses and wiring and eliminate faults.

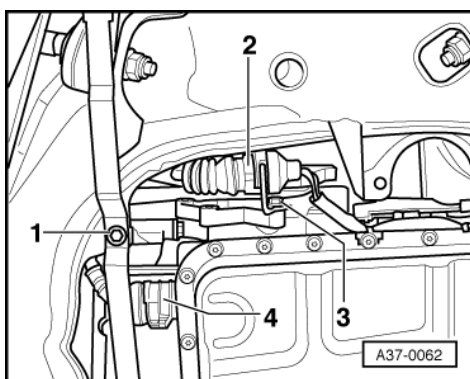
Notes:

If functional check and power supply of multi-function switch are OK, check wiring from automatic gearbox control unit -J217 to multi-function switch -F125 => Page 148



3. Checking wiring from automatic gearbox control unit -J217 to 10-pin multi-function switch -F125

- -> For all test steps, switch off ignition, unplug multi-pin connector from automatic gearbox control unit -J217 (control unit is located in front of right seat beneath cover in footwell => Page 3) and connect test box V.A.G 1598/20 to wiring harness connector.



- -> Connect the two 10-pin connectors -2- to multi-function switch (as illustrated).
- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Checking for gearbox with 10-pin connector at multi-function switch -F125

Select measuring range: Voltage measurement						
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification	
1	54 + 34 54 + 6 55 + 34 55 + 6	Voltage supply	▪ Ignition on	approx. battery voltage	- Check fuses - Use current flow diagram to check wiring	
2	36 + 34 36 + 6	Multi-function switch -F125	▪ Ignition on Selector lever set to "P", "N" and "D"	approx. battery voltage	- Check connector at multi-function switch for contact corrosion	
			- Selector lever set to "R", "4", "3" and "2"	Less than 1 V	- Use current flow diagram to check wiring	
	8 + 34 8 + 6		▪ Ignition on Selector lever set to "R", "N" and "4"	approx. battery voltage	- Check power supply of multi-function switch => Page 147	
			- Selector lever set to "P", "D", "3" and "2"	Less than 1 V	- Check control unit wiring to 10-pin connector => Page 151	
Continued ▼						

Checking for gearbox with 10-pin connector at multi-function switch -F125

Select measuring range: Voltage measurement					
Test step	V.A.G 1598/20	Testing of	Test conditions - Additional work	Specification	Measures if reading does not match specification
Continuation of	37 + 34 37 + 6		- Selector lever set to "N", "D", "4" and "2"	approx. battery voltage	- Check connector at multi-function switch for contact corrosion
2			- Selector lever set to "P", "R" and "3"	Less than 1 V	- Use current flow diagram to check wiring



	9 + 34 9 + 6		- Selector lever set to "D", "4" and "3"	approx. battery voltage	- Check power supply of multi-function switch => Page 147
			- Selector lever set to "P", "R", "N" and "2"	Less than 1 V	- Check control unit wiring to 10-pin connector => Page 151

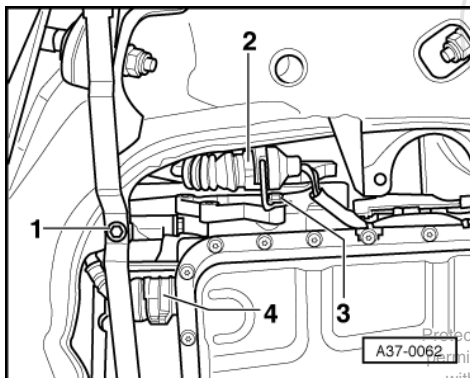
Checking for gearbox with 10-pin connector at multi-function switch -F125

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
3	55 + 54	Multi-function switch -F125	▪ Ignition off	$\leq 1.5 \omega$	- Check connector at multi-function switch for contact corrosion - Check wiring from 88-pin control unit to 10-pin connector => Page 137 - Perform test steps 6 and 27
	55 + 36		▪ Ignition off Selector lever set to "P", "N" and "D"	Less than 26 ω	
			- Selector lever set to "R", "4", "3" and "2"	Infinity ($\omega 1$)	
	55 + 8		▪ Ignition off Selector lever set to "R", "N" and "4"	Less than 26 ω	
Continued ▼			- Selector lever set to "P", "D", "3" and "2"	Infinity ($\omega 1$)	

Checking for gearbox with 10-pin connector at multi-function switch -F125

Select measuring range: Resistance measurement					
Test step	V.A.G 1598/20	Testing of	▪ Test conditions - Additional work	Specification	Measures if reading does not match specification
Continuation of 7	55 + 37	Multi-function switch -F125	▪ Ignition off Selector lever set to "N", "D", "4" and "2"	≤ 1.5 ω	- Check connector at multi-function switch for contact corrosion - Check wiring from 88-pin control unit to 10-pin connector => Page 137
			- Selector lever set to "P", "R" and "3"	Infinity ω1)	
	55 + 9		▪ Ignition off Selector lever set to "D", "4" and "3"	Less than 26 ω	
			- Selector lever set to "P", "R", "N" and "2"	Infinity ω1)	

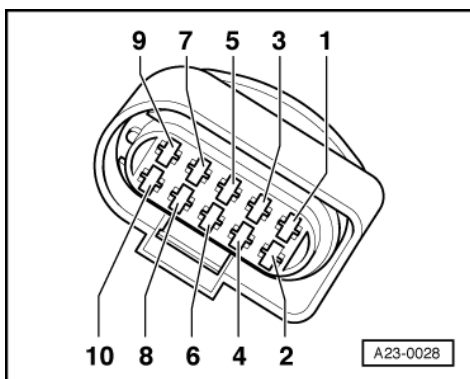
- 1) Switch V.A.G 1526 to maximum ω range
- 2) Fuse for multi-function switch -F125 power supply



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4. Checking wiring from automatic gearbox control unit -J217 to 10-pin connector at multi-function switch

- Switch off ignition.
- -> Unplug 10-pin connector -2- to multi-function switch.



- -> Contact assignment at 10-pin connector of multi-function switch
- F125 (sockets to gearbox control unit).

Checking is performed between 10-pin connector (sockets) and test box V.A.G 1598/20 at control unit connector.

- Make use of portable multimeter V.A.G 1526A or vehicle diagnostic, testing and information system VAS 5051.

Checking for gearbox with 10-pin connector at multi-function switch -F125

Connector contact	Test box V.A.G 1598/20, socket	Specification	Measures if reading does not match specification
1	54, 55	$\leq 1.5 \, \omega$	- Use current flow diagram to eliminate open circuit in wiring Check connector for: - Contact corrosion - Ingress of water - 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	Refer to reversing lights	$\leq 1.5 \, \omega$	
9	P/N signal for engine control unit	$\leq 1.5 \, \omega$	
10	6, 34	$\leq 1.5 \, \omega$	