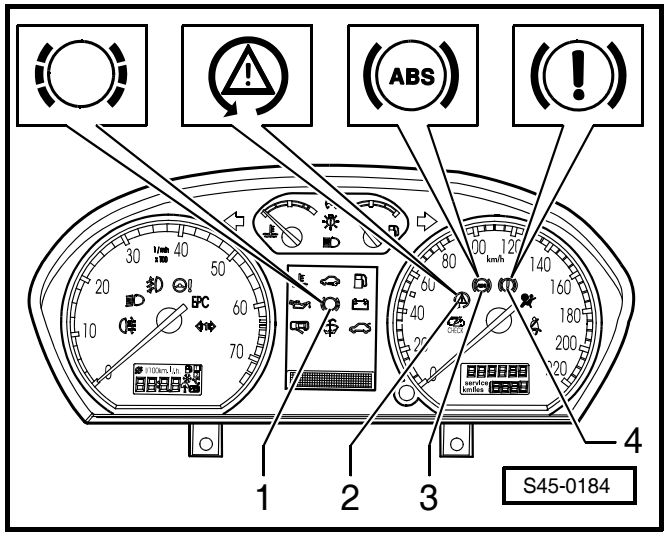
45 – Anti-Lock Brake System

45-1 Antilock braking system (ABS)

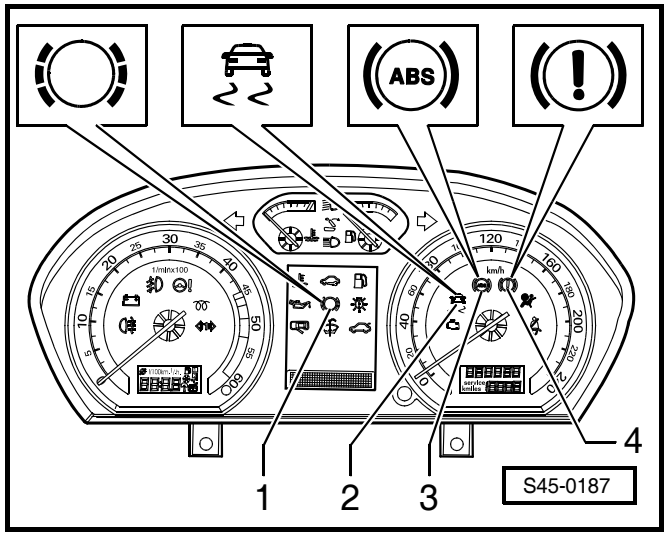
Safety precautions, basic information on fault finding and on repairing

- The ABS and ESP are vehicle safety systems; detailed system knowledge is required for working on such systems.
- Testing and replacement or repairs should be carried out only by personnel specially trained for ABS.

Dash panel insert up to model year 2004 ►



Dash panel insert as of model year 2005 ►



- Faults are indicated by the ABS warning light -K47- (-3-), the red dual circuit and hand brake system warning light -K7- (-4-) and the traction control system warning light -K86- or ESP and TCS warning light -K155- (-2-). Certain faults are not detected until after a minimum speed of 20 km/h has been exceeded (conduct a road test).
- The brake pad warning light -K32- (-1-) indicates the condition of the brake pads. If the warning light does not go out after the ignition is switched on or it comes on when driving, the brake pads could be worn down.
- If the ABS warning light -K47- and the dual circuit and hand brake system warning light -K7- do not light up and if in spite of this the brake system is not fully operational, look for the fault in the conventional brake system ⇒ Chap. 46-1 and ⇒ Chap. 47-1.
- Notes on rectifying sudden faults ⇒ Technical Service Handbook.

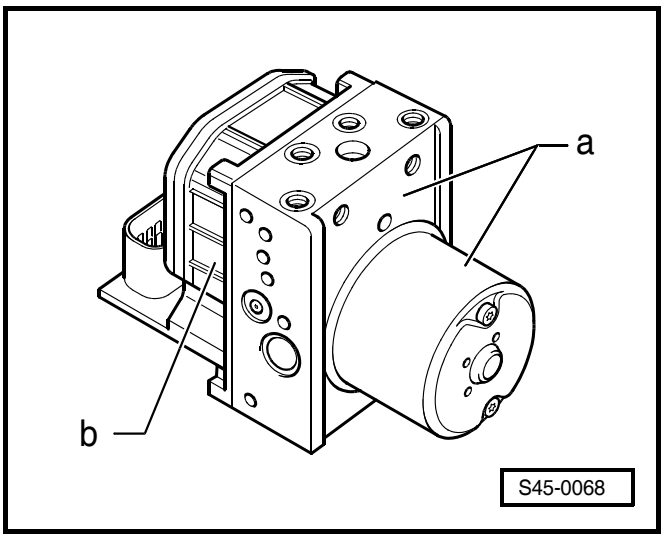
Instructions for repair work on Antilock braking system

ABS systems BOSCH 5.7 and BOSCH 8.0

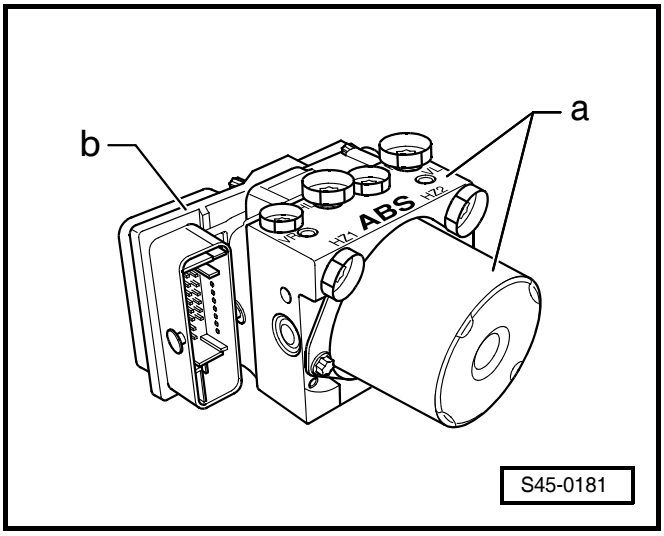
- The hydraulic unit of the systems ABS, ABS/EDL/TCS BOSCH 5.7 and ABS, ABS/TCS BOSCH 8.0 can be disassembled and repaired.
- The hydraulic unit ABS/EDL/TCS/ESP BOSCH 5.7 and ABS/TCS/ESP BOSCH 8.0 must not be disassembled and repaired. In the event of faults or defects, replace the complete hydraulic control unit.
- A repair of the hydraulic control unit is only possible in an unmounted condition.

- The separation of the hydraulic unit for ABS -N55- and the return flow pump for ABS -V39- (-a-) from the ABS control unit -J104- (-b-) is possible.
- The separation of the return flow pump for ABS -V39- from the hydraulic unit for ABS -N55- is not permitted.

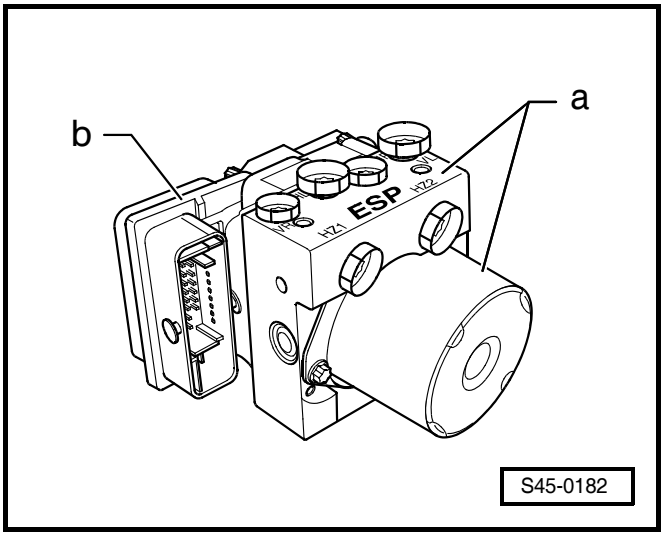
ABS BOSCH 5.7 ►



ABS, ABS/TCS BOSCH 8.0 ►



ABS/TCS/ESP BOSCH 8.0 ►



Continued for ABS systems BOSCH 5.7 and BOSCH 8.0

- Carefully cover or close opened components if the repair is not completed immediately (use plugs repair kit -1H0 698 311 A-).
- After separating the control unit/hydraulic unit use the transport protection for valve domes.
- Before commencing work on the ABS systems it is necessary to interrogate the fault memory in order to check complaints and conduct specific fault finding.
- The interrogation of the fault memory can be performed within the framework of:

  the self diagnosis with the vehicle system tester -V.A.G 1552- or

  with the vehicle diagnosis, measurement and information system -VAS 5051-.

- Do not separate plug connections unless the ignition is switched off.
- Before commencing work on the ABS systems, switch off the ignition and disconnect the earth strap at the battery ⇒ Electrical System; Rep. Gr. 27. On models fitted with a coded radio set, pay attention to the coding; determine if necessary.
- Welding work using electric welding equipment may affect the ABS or ESP systems.
- Before commencing welding work using electrical welding tool:

– Disconnect the cable form the negative terminal of the battery and cover the negative terminal.

– Connect the earth connection of the electric welding tool directly to the part to be welded. There must not be any electrically insulated parts between the earth connection and the welding point.

– Electronic control units and electrical wiring must not touch the earth connection or the welding electrode.

- During paintwork, the electronic control unit can be loaded for a short time at a maximum of 95 °C and for longer period (approx. 2 hours) at a maximum of 85 °C.
- Do not drive the vehicle if the connector is unplugged from the control unit.
- When carrying out work on the antilock brake system, ensure scrupulous cleanliness, on no account use agents containing mineral oils, such as oil, greases, etc.
- Thoroughly clean connection points and the surrounding area before disconnecting, but do not use any aggressive cleaning agents, such as brake cleaner, petroleum, thinner or similar.
- Place removed parts on a clean surface and cover.
- Carefully cover or seal opened components if the repairs are not carried out immediately (use plugs from repair kit 1HO 698 311 A).
- Do not use fluffy clothes.
- Remove spare parts from their wrapping immediately before fitting.
- Use only genuine wrapped parts.
- If the system is opened, avoid working with compressed air and avoid moving the vehicle.
- Ensure that no brake fluid is able to flow into the connectors.
- Observe the relevant instructions when handling brake fluid ⇒ Chap. 47-4.
- After completing work which involved opening the brake system, bleed brake system with brake filling and bleeding device, e. g. -ROMESS S15-, ⇒ Chap. 47-4.
- During the subsequent road test, ensure that at least one controlled brake application is performed (pulsing must be felt on the brake pedal).

Required technical information

- Binder „Current Flow Diagrams, Electrical Fault Finding and Fitting Locations“
- Self-study programme ABS or ESP
- Technical Service Handbook
- Operating instructions for the vehicle diagnosis, measuring and information system -VAS 5051-

45-2 Distinguishing features of the ABS system

General Instructions

- The ABS prevents the wheels from locking during a brake application initiated by the driver.
- The electronic differential lock (EDL) is a starting-off aid. A supporting torque is created for the differential by electronically controlling the braking of the driven wheel which is slipping. The engine power is thus available for the gripping wheel with the better adhesion. This also applies when reversing.
- The traction control system (TCS) prevents the driving wheels from slipping when accelerating while reducing the engine power output. This is possible over the entire vehicle speed range. EDL and TCS are mutually supportive when accelerating the vehicle.
- The engine drag torque control (EDC) prevents that the drive gears are blocked by the engine because of the braking ratio, if suddenly the accelerator pedal is released or when braking with a gear engaged.
- The electronic stability program (ESP) recognizes critical driving conditions and stabilizes the vehicle by individual wheel braking and by intervention in the engine control. This occurs independently of the brake or accelerator pedal activation.
- The ESP is active over the entire speed range. If the ESp is in regulating mode the ESP warning lamp flashes three times per second.
- The description of the structure and function of the ESP can be found in self-study programme No. 42.
- The brake system is split diagonally. Brake servo assistance is provided pneumatically by the vacuum brake servo unit.
- Vehicles fitted with ABS, ABS/EDL/TCS or ABS/EDL/TCS/ESP BOSCH 5.7 as well as vehicles with ABS, or ABS/TCS or ABS/TCS/ESP BOSCH 8.0 do not have a mechanical brake pressure regulator. Specifically matched software in the control unit, the electronic brake pressure distribution (EBD) regulates the brake pressure on the rear axle.
- The return flow pump for ABS -V39-, the hydraulic unit for ABS -N55- and the ABS control unit -J104- form the hydraulic control unit.
- New control units supplied through the Parts Division are not coded. They must be coded after installation.
- Code ABS systems BOSCH 5.7 with the vehicle system tester -V.A.G 1552- ⇒ Chap. 45-8 or with the vehicle diagnosis, measurement and information system -VAS 5051- ⇒ Chap. 45-4.
- Code ABS systems BOSCH 8.0 with the vehicle system tester -V.A.G 1552- ⇒ Chap. 45-9 or with the vehicle diagnosis, measurement and information system - VAS 5051- ⇒ Chap. 45-4.

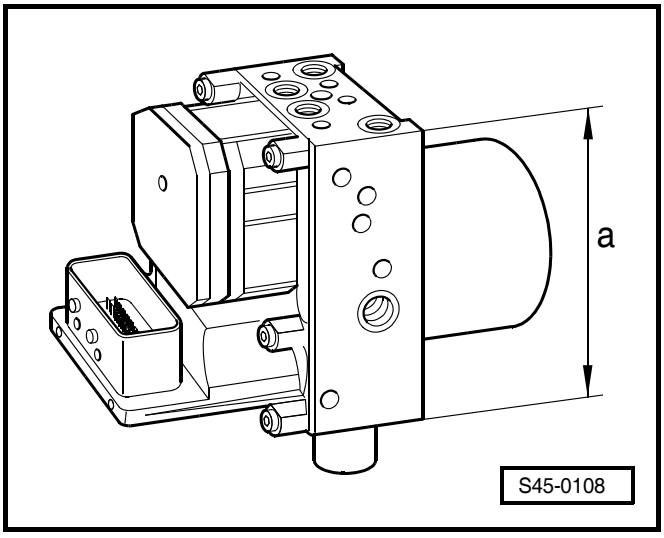
Distinguishing features

Note

Identification and assignment of the ABS systems ⇒ Spare parts catalogue.

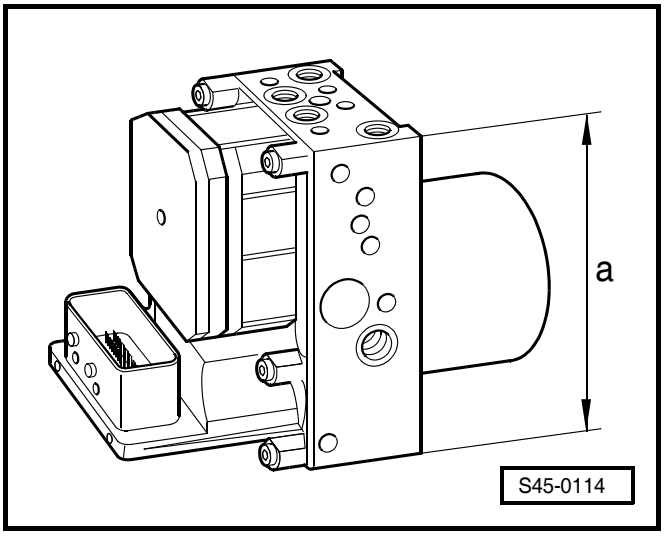
ABS BOSCH 5.7 ►

- Dimension -a-: 102 mm
- 8 valve domes: The protective sleeves for the valves are visible if the control unit is separated from the hydraulic unit ⇒ Chap. 45-17.
- Control unit identification: The control unit version can be displayed with the -V.A.G 1552- via the function 01 „Interrogating control unit version“ ⇒ Chapter 45-5 or with the vehicle diagnosis system, measurement and information system -VAS 5051- ⇒ Chapter 45-4.
- List of available functions ⇒ Chap. 45-5.



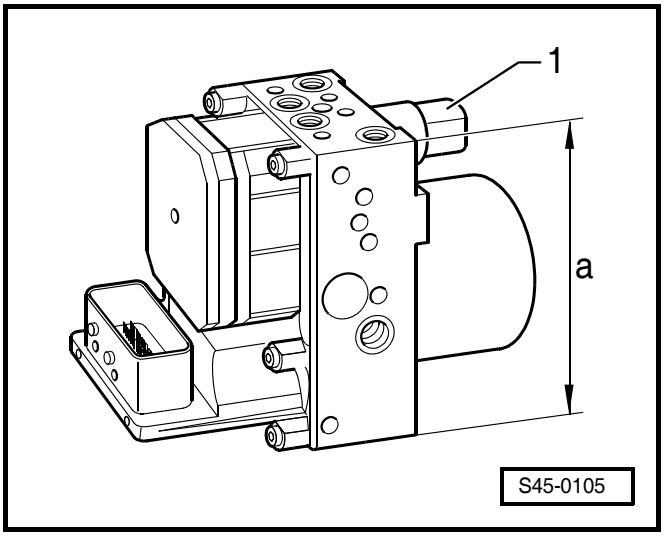
ABS/EDL/TCS BOSCH 5.7 ►

- Dimension -a-: 127 mm
- 12 valve domes: The protective sleeves for the valves are visible if the control unit is separated from the hydraulic unit ⇒ Chap. 45-17.
- Control unit identification: The control unit version can be displayed with the -V.A.G 1552- via the function 01 „Interrogating control unit version“ ⇒ Chapter 45-5 or with the vehicle diagnosis system, measurement and information system -VAS 5051- ⇒ Chapter 45-4.
- List of available functions ⇒ Chap. 45-5.



ABS/EDL/TCS/ESP BOSCH 5.7 ►

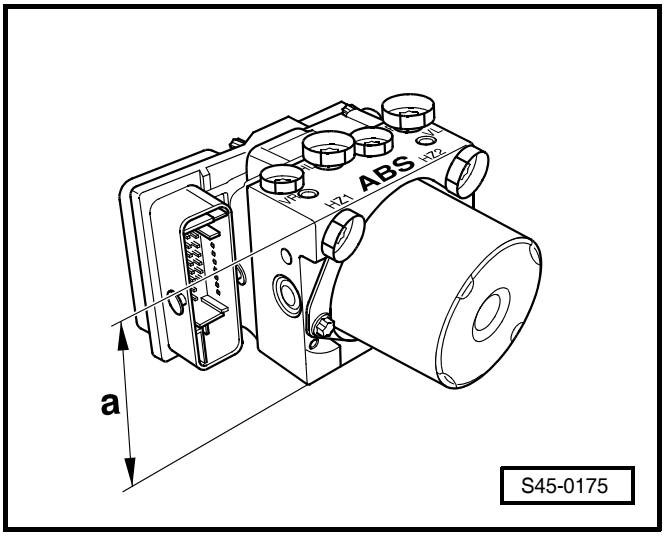
- Dimension -a-: 130 mm
- 12 valve domes
- Brake pressure sender 1 -G201- (-1-)
- Control unit identification: The control unit version can be displayed with the -V.A.G 1552- via the function 01 „Interrogating control unit version“ ⇒ Chapter 45-5 or with the vehicle diagnosis system, measurement and information system -VAS 5051- ⇒ Chapter 45-4.
- List of available functions ⇒ Chap. 45-5.



Note

ABS, ABS/TCS BOSCH 8.0

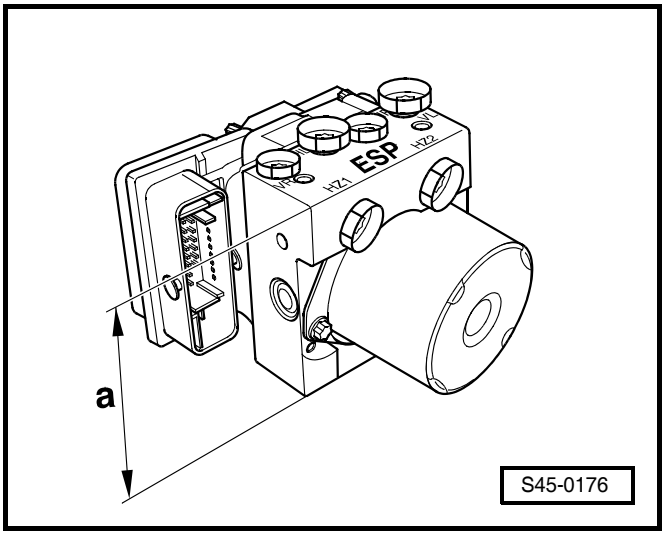
- Dimension -a-: 80 mm
- Inscription „ABS“ on the hydraulic unit for ABS -N55-
- 8 valve domes: The protective sleeves for the valves are visible if the control unit is separated from the hydraulic unit.
- Control unit identification: The control unit version can be displayed with the -V.A.G 1552- via the function 01 „Interrogating control unit version“ ⇒ Chapter 45-5 or with the vehicle diagnosis system, measurement and information system -VAS 5051- ⇒ Chapter 45-4.



ABS/TCS/ESP BOSCH 8.0

The hydraulic control unit ABS/TCS/ESP BOSCH 8.0 must not be disassembled. It must be replaced as a complete unit in the case of repairs.

- Dimension -a-: 103 mm
- Inscription „ESP“ on the hydraulic unit for ABS -N55-
- 12 valve domes
- Control unit identification: The control unit version can be displayed with the -V.A.G 1552- via the function 01 „Interrogating control unit version“ ⇒ Chapter 45-5 or with the vehicle diagnosis system, measurement and information system -VAS 5051- ⇒ Chapter 45-4.



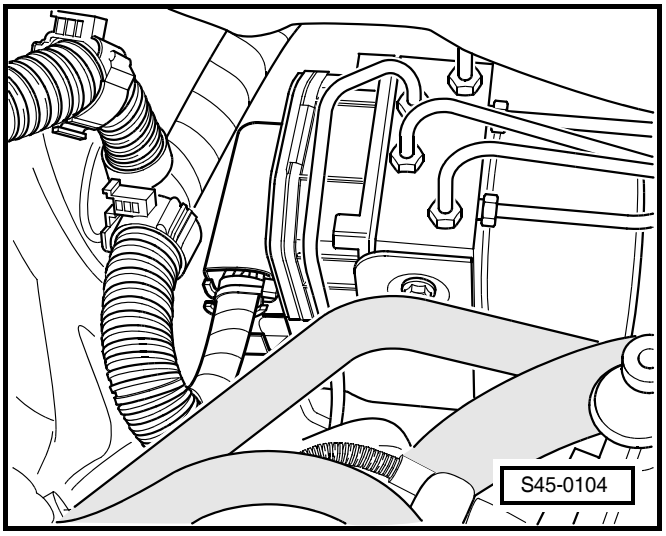
Fitting position of the ABS systems BOSCH 5.7 and BOSCH 8.0

ABS, ABS/EDL/TCS or ABS/EDL/TCS/ESP BOSCH 5.7

In the engine compartment, to the right on the lateral part of the engine compartment

Note

The Fig. shows the ABS or ABS/EDL/TCS BOSCH 5.7 hydraulic control unit.

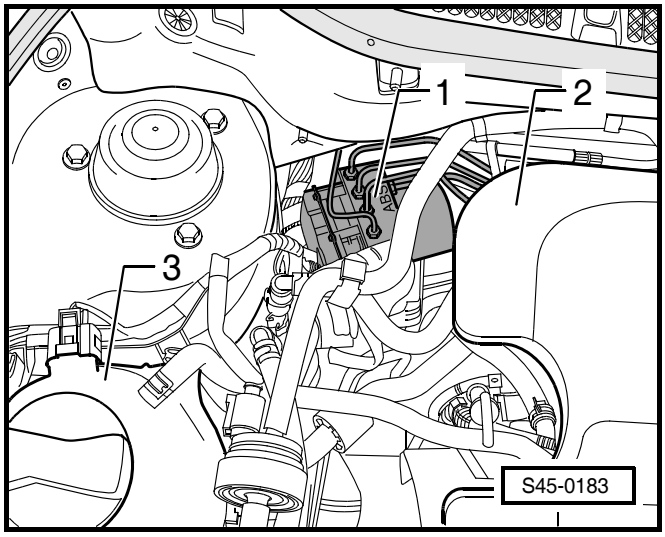


ABS, ABS/TCS or ABS/TCS/ESP BOSCH 8.0

In the engine compartment, to the right on the lateral part of the engine compartment

Note

The Fig. shows the ABS or ABS/TCS BOSCH 8.0 hydraulic control unit.



45-3 Function of Self-diagnosis

General Instructions

ABS systems BOSCH 5.7 and BOSCH 8.0

As the control units are interlinked over two data BUS lines, always start fault finding by interrogating the contents of the fault memories of all the control units fitted to the vehicle.

The interrogation of the fault memory can be performed with the vehicle system tester -V.A.G 1552- by the „automatic test sequence“ (activation with the key function 0 0) ⇒ Chap. 45-5 or with the vehicle diagnosis system, measurement and information system -VAS 5051- ⇒ Chap. 45-4.

When doing so check whether a possibly stored fault might affect the ABS system.

The ABS control unit -J104- together with the hydraulic unit for ABS -N55- forms a compact unit. The unit is located in the right of the engine compartment. The control unit is equipped with a fault memory. The connection for self-diagnosis is located in the storage compartment on the driver's side.

Self-diagnosis relates to the electrical/electronic part of the ABS, i. e. faults are detected only over the electrical connection to the control unit, e.g. open circuit of a wheel speed sensor.

The control unit detects faults during the operation of the vehicle and stores them in a permanent memory, whose information is retained even if the battery voltage is disconnected.

Faults which occur sporadically (isolated) are likewise detected and stored. If this fault no longer occurs during 40 vehicle starts and driving-off procedures, it is erased from the fault memory (fault delete counter), with the exception of the fault „Control unit defective“.

After the ignition is switched on the ABS warning light -K47-, the red dual circuit and hand brake system warning light -K7- and the traction control system warning light -K86- or the ESP and TCS warning light -K155- light up for approx. 2 seconds.

During this period a test sequence (self-check) is performed in the control unit with the following functions:

- Test of supply voltage, min. 11.0 Volts.
- Test of control unit including valve coils.
- Electrical test of wheel speed sensors, not fully completed until vehicle reaches 20 km/h.
- Check of control unit coding.
- Test of electric motor for the return flow pump (hydraulic pump).

Before starting fault finding, always initiate self-diagnosis and retrieve the stored information using vehicle system

tester -V.A.G 1552- ⇒ Chap. 45-5 or using vehicle diagnosis system, measurement and information system -VAS 5051- ⇒ Chap. 45-4.

Note

- *The description ⇒ Chap. 45-5 only relates to the vehicle system tester -V.A.G 1552- using the current program card.*
- *The use of fault reader -V.A.G 1551- with integrated printer is similar. A minor deviation on the display read-out is possible.*

Vehicle fitted with ABS/EDL/TCS or ABS/EDL/TCS/ESP BOSCH 5.7 does not have an EDL function

Complaint: „Vehicle EDS system does not operate“

When dealing with this complaint a possible fault cause may be that the brake light switch is incorrectly set or is not operating ⇒ Chap. 45-10, read measured value block, display group numbers 002 and 004.

45-4 Vehicle diagnosis, measurement and information system -VAS 5051-

Connect vehicle diagnosis, measurement and information system -VAS 5051- and select functions (ABS systems BOSCH 5.7 and BOSCH 8.0)

The self-diagnosis of the ABS systems BOSCH 5.7 and BOSCH 8.0 can be performed using the vehicle diagnosis, measurement and information system -VAS 5051-.

Special tools, test and measuring equipment and auxiliary items required

- Vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -VAS 5051/5A- or Diagnostic cable -VAS 5051/6A-

WARNING!

- ***For test drives, test and measuring equipment must always be fastened to the rear seat.***
- ***The equipment must be operated by an assistant during test drives.***

– Mount the plug of the diagnostic cable -VAS 5051/5A- or the diagnostic cable -VAS 5051/6A- on the diagnostic connection in the storage compartment on the driver's side.

– Switch on the vehicle diagnosis, measurement and information system -VAS 5051- -arrow-.

The vehicle diagnosis, measurement and information system -VAS 5051- is operational, if it shows the keyboards of its operating modes.

– Switch on ignition.

– On the screen, select the **Geführte Fehlersuche**.

– Select the following one after the other:

- Brand
- Type
- Model year
- Variant
- Engine identification characters

– Confirm the data entered.

Wait until the vehicle diagnosis, measurement and information system -VAS 5051- has communicated with all the control units in the vehicle (vehicle system test).

– Press the **Sprung** and choose the „Selected Functions/Components“ option.

– Select on the display „chassis“
– Select on the display „brake system“
– Select on the display the indicated „01-self-diagnosable system…“.
– Select on the display the indicated „Antilock braking system …“.

Now all possible components and functions of the antilock braking system in the vehicle are indicated.

– Select on the display the desired component or the desired function.

45-5 Performing Self-diagnosis - ABS systems BOSCH 5.7 and BOSCH 8.0

Test requirements

- Approved tyre size fitted to all wheels; tyres inflated to the specified pressure.
- Mechanical/hydraulic part of the brake system together with the brake light switch and brake lights operating properly.
- No leaks in hydraulic connections and lines (visual inspection of hydraulic unit, brake calipers, wheel brake cylinders, tandem brake master cylinder).
- Wheel bearings and wheel bearing play O.K.
- Control unit correctly bolted to the hydraulic unit.
- Plug connection on ABS control unit -J104- correctly plugged in (lock is engaged).
- Inspect plug contacts of ABS components for damage and correct fitting.
- All fuses must be OK in compliance with the current flow diagram.
- Battery voltage at least 11 V.

Connecting vehicle system tester -V.A.G 1552- and selecting function

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B- or -V.A.G 1551/3C-

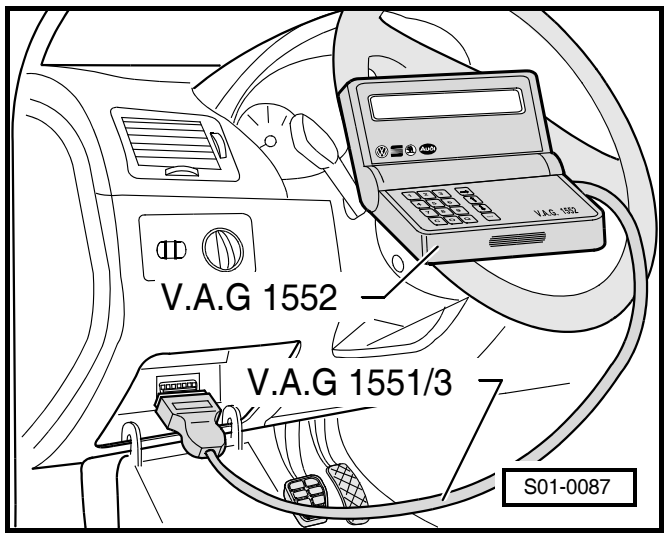
Note

- *During self-diagnosis the ABS function is disconnected in the control unit.*
- *TheWarning lights -K47-, -K7- and -K86/K155- light up during self-diagnosis.*

The diagnostic connection is located in the storage compartment on the driver's side.

– Connect vehicle system tester -V.A.G 1552- with the diagnostic cable -V.A.G 1551/3-. ►

– Switch on the ignition.



Interrogating control unit version

Readout on display: ►

```
Vehicle system test                    HELP
Enter address word XX
```

– Press 0 and 3 for the address word „brake electronics“ and confirm the entry with Q.

After approx. 5 seconds the display will show: ►

```
6Q0614117   ABS 5.7   FRONT   X00     ->
Coding 00036                 WSC xxxxx
```

The display shows:

- the control unit identification number, e.g. 6Q0614117
- the system designation, e. g. ABS 5.7 Front
- the version number, e.g. X00
- the code No. of the control unit, e.g. 00036
- the workshop code (WSC ⇒ Operatinginstructions vehicle system tester V.A.G. 1552)

Assignment of the control unit ⇒ Spare part catalogue

If the control unit identification number is not displayed: ⇒ 45-5 page 2.

– Press [→].

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

Overview of selectable functions

01 - Interrogating control unit version ⇒ 45-5 page 1
02 - Interrogating fault memory ⇒ 45-5 page 2
03 - Final control diagnosis ⇒ Chap. 45-12
04 - Basic setting BOSCH 5.7 ⇒ Chap. 45-13, BOSCH 8.0 ⇒ Chap. 45-14 [1)]
05 - Erasing fault memory ⇒ 45-5 page 3
06 - Ending output ⇒ 45-5 page 3
07 - Code control unit BOSCH 5.7 ⇒ Chap. 45-8, BOSCH 8.0 ⇒ Chap. 45-9
08 - Reading measured value block BOSCH 5.7 ⇒ Chap. 45-10, BOSCH 8.0 ⇒ Chap. 45-11

Interrogating fault memory

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press [0] and [2] for the function „Interrogate fault memory“ and confirm with [Q].

The number of faults stored appears on the display

```
X faults detected!
```

or

```
No fault detected!                     ->
```

Eventuell gespeicherte Fehler eines Systems werden nacheinander angezeigt.

– Press [→].

The stored faults are displayed in sequence.

– Note the fault message displayed and refer to the fault table for the corresponding ABS system BOSCH 5.7 ⇒ Chap. 45-6, BOSCH 8.0 ⇒ Chap. 45-7.

If „No fault detected“ appears the program returns to its initial setting after key [→] is pressed.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– End output (Function 06) ⇒ 45-5 page 3.

[1)] only required for vehicles with ABS/EDL/TCS (BOSCH 5.7), ABS/EDL/TCS/ESP (BOSCH 5.7) or ABS/TCS/ESP (BOSCH 8.0)

– Switch off ignition and disconnect the diagnostic plug connection.

Note

- *If a fault is detected:*
- *1. Rectify fault (repair)*
- *2. Interrogate fault memory (Function 02)*
- *3. Erase fault memory (Function 05)*
- *4. End output (function 06)*
- *5. Road test*
- *6. Interrogate the fault memory again*

Erasing fault memory

Requirements:

- Fault memory interrogated ⇒ 45-5 page 2.
- All faults rectified.

After interrogating the fault memory:

Readout on display:

```
Vehicle system test                HELP
Select function XX
```

– Press 0 and 5 for the function „Erase fault memory“ and confirm with Q.

Readout on display:

```
Vehicle system test                 ->
Fault memory erased!
```

The fault memory is now erased.

– Press →.

Readout on display:

```
Vehicle system test                HELP
Select function XX
```

Note

- *If the following message is displayed the test sequence is incorrect.*
- *Carefully follow the test sequence step by step: first interrogate the fault memory, if necessary rectify faults and then erase the fault memory.*

```
Vehicle system test                 ->
Fault memory was not interrogated
```

Ending output

– Press 0 and 6 for the function „End output“ and confirm with Q.

Readout on display:

```
Vehicle system test                HELP
Enter address word XX
```

– Switch off ignition.

– Disconnect plug connections from vehicle system tester -V.A.G 1552-.

– Switch on ignition.

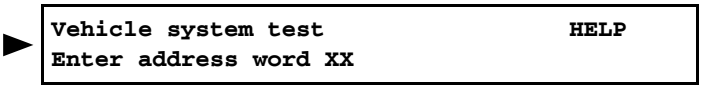
The warning lights -K47-, -K7- and -K86/K155- must go out after approx. 2 seconds.

Automatic test sequence

Note

- *During testing and installation other control units may also detect faults, e.g. pulled-out connectors. This is why you must conclude the self-diagnosis by interrogating and erasing the fault memories of all control units.*
- *With the automatic test sequence all fault memory contents of the control units are interrogated.*

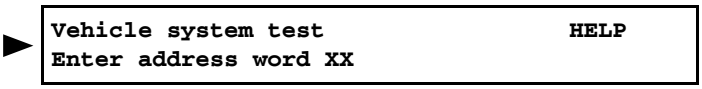
Readout on display:



– Press 0 twice for address word „Automatic test sequence“ and confirm with Q.

After this all the control unit identifications with possible entries from the fault memories appear in the display in the order of the address words.

The „automatic test sequence“ is completed when the following read-out appears on the display:



45-6 Fault table - ABS systems BOSCH 5.7

Note

- *As the control units are interlinked over two data BUS lines, always start fault finding by activating the function „Automatic test sequence“ ⇒ Chap. 45-5 on all control units fitted to the vehicle This allows to interrogate all the control units fitted on the vehicle to determine their possible faults.*
- *All the possible faults which can be detected by the ABS control unit -J104- and which can be displayed on vehicle system tester -V.A.G 1552- during interrogation of the fault memory content, are listed below.*
- *The fault table is ordered according to the 5-digit fault code on the left.*
- *The fault table may also display the fault type.*
- *The column „Fault elimination“ refers to certain test steps in the electrical test.*
- *Before replacing acomponent fault to be faulty test all corresponding plug connections, lines and earth connection according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.*
- *After carrying out the repair always interrogate and erase the fault memory using vehicle system tester -V.A.G 1552- and perform a test drive (at a speed above 20 km/h).*
- *After the test drive interrogate the fault memory again.*

Read-out on display -V.A.G 1552-		Rectifying fault
no fault detected		If after repair „No fault detected“ is displayed, the self-diagnosis is completed. If in spite of display read-out „No fault detected“ the ABS does not operate without fault, proceed as follows: 1. Perform a test drive at a speed above 20 km/h, 2. interrogate the fault memory again, if still no fault is stored, 3. continue fault finding without self-diagnosis and run through the Electrical Test completely ⇒ Chapter 45-15.
00257 ABS FL- N101 inlet valve		– Performing a final control diagnosis, function 03 ⇒ Chapter 45-12. – Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
00259 ABS FR -N99 inlet valve		
00265 ABS FL- N102 outlet valve		
00267 ABS FR- N100 outlet valve		
00273 ABS RR -N133 inlet valve		
00274 ABS RL -N134 inlet valve		
00275 ABS RR -N135 outlet valve		
00276 ABS RL -N136 outlet valve		

Read-out on display -V.A.G 1552-		Rectifying fault
00283 Speed sensor vl-G47	Open circuit/Short circuit to positive Implausible signal	– Read the measured value block ⇒ Chapter 45-10, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the front left speed sensor -G47- and sensor ring for damage. – Replace the speed sensor -G47- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
00285 Speed sensor vr-G45	Open circuit/Short circuit to positive Implausible signal	– Read the measured value block ⇒ Chapter 45-10, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the front right speed sensor -G45- for damage. – Replace the speed sensor -G45- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
00287 Speed sensor hr-G44	Open circuit/Short circuit to positive Implausible signal	– Read the measured value block ⇒ Chapter 45-10, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the rear right speed sensor -G44- for damage. – Replace the speed sensor -G44- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
00290 Speed sensor hl-G46	Open circuit/Short circuit to positive Implausible signal	– Read the measured value block ⇒ Chapter 45-10, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the rear left speed sensor -G46- for damage. – Replace the speed sensor -G46- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.

Read-out on display -V.A.G 1552-		Rectifying fault
00301 Return flow pump for ABS - V39	Open circuit	– Read the measured value block ⇒ Chapter 45-10, display group 002 or 006 . – Erasing fault memory (05) ⇒ Chapter 45-5. – Ending output (06) ⇒ Chapter 45-5. – Switch off ignition. – Switch on ignition. If the fault occurs again: – Replace hydraulic control unit ⇒ Chapter 45-17.
00302 ABS solenoid valve relay - J106	Open circuit	– Read the measured value block ⇒ Chapter 45-10, display group 006. – Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
00526 Brake light switch -F	Open circuit	– Read the measured value block ⇒ Chapter 45-10, display group 002. – Carry out the Electrical Test, test step no. 4 ⇒ Chapter 45-15. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Replacing brake light switch ⇒ Chapter 45-16.
00532 Supply voltage Note: ♦ This fault is related to the voltage supply of the control unit. ♦ This fault is only stored if it occurs at a vehicle speed above 6 km/h.	Signal outside tolerance Signal too low	– Carry out the Electrical Test, test step no. 1 ⇒ Chapter 45-15. – Determine and eliminate open circuit in voltage supply ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test battery, AC generator and voltage regulator ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. The ABS, ABS/EDL/TCS or ABS/EDL/TCS/ESP system is switched on again as soon as the vehicle voltage exceeds 10 volts and the warning lights go out. – Test earth connections. If no fault is found in the voltage supply: – Replace hydraulic control unit ⇒ Chapter 45-17.
00597 Different wheel speed pulses		– Test wheels and tyre pressures ⇒ Chapter 00-4. – Check the fitting position of the speed sensor and wheel bearing with sensor ring and replace if necessary ⇒ Chapter 40-3 or ⇒ Chapter 42-3.

Read-out on display -V.A.G 1552-		Rectifying fault
00753 Electr. connections wheel speed pulses	Electrical fault in the circuit	– Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
00778 Steering angle sender -G85	defective	– Read the measured value block ⇒ Chapter 45-10, display groups 005 and 125. – Perform null balance of the steering angle sender -G85- ⇒ Chapter 45-13. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – If necessary replace steering angle sender -G85- ⇒ Chap. 45-16.
	Balance not performed	– Perform null balance of the steering angle sender -G85- ⇒ Chapter 45-13.
	Implausible signal	– Read the measured value block ⇒ Chapter 45-10, display groups 005 and 125. – Check fitting position of the steering angle sender -G85- ⇒ Chapter 45-16. – Carry out check of chassis alignment ⇒ Chapter 44-2 – Perform null balance of the steering angle sender -G85- ⇒ Chapter 45-13.
01044 Control unit wrongly coded		– Coding ABS with EDL control unit -J104- ⇒ Chapter 45-8.
01119 Signal for gear recognition		– Performing automatic test sequence ⇒ Chapter 45-5.
01197 Data bus drive: wrong software version		– Performing automatic test sequence ⇒ Chapter 45-5.
01200 Power supply for ABS valves Note: ♦ This fault is related to the voltage supply to the hydraulic unit -N55- and the return flow pump motor -V39-.		– Carry out the Electrical Test, test step no. 2 ⇒ Chapter 45-15. – Determine and eliminate open circuit in voltage supply ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test battery, AC generator and voltage regulator ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test relay for solenoid valves, read measured value block ⇒ Chapter 45-10, display groups 002 or 006. If no fault is found in the voltage supply: – Performing a final control diagnosis, function 03 ⇒ Chapter 45-12.

Read-out on display -V.A.G 1552-		Rectifying fault
01312 Drive databus	defective [1]	– Coding ABS with EDL control unit -J104- ⇒ Chapter 45-8. – Test the control unit coding ⇒ Engine - Fuel Injection; Rep. Gr. 01. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Carry out the Electrical Test, test step no. 6 ⇒ Chapter 45-15.
	defect sporadic [1]	– Erasing fault memory ⇒ Chapter 45-5. – No further measures required. – Inform customer.

[1] The fault does not result in the ABS warning lamp -K47- or the dual circuit and hand brake system warning lamp -K7 - lighting up. The ABS function is fully maintained.

Read-out on display -V.A.G 1552-		Rectifying fault
01314 Engine control unit	No communication	– Read the measured value block ⇒ Chapter 45-10, display group 125. – Carry out the Electrical Test, test step no. 6 ⇒ Chapter 45-15. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Perform self-diagnosis of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.
	please read out fault memory	– Read out fault memory of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.
01315 Gearbox control unit	No communication	– Read the measured value block ⇒ Chapter 45-10, display group 125. – Carry out the Electrical Test, test step no. 6 ⇒ Chapter 45-15. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Perform self-diagnosis of the gearbox control unit ⇒ automatic gearbox 001; Rep. Gr. 01.
	please read out fault memory	– Read out the fault memory of the automatic gearbox control unit ⇒ Automatic Gearbox; Rep. Gr. 01.
01316 Brake control unit	No communication	– Testing data BUS ⇒ Electrical system; Rep. Gr. 90
01317 Control unit with display in dash panel insert -J285	No communication	– Read the measured value block ⇒ Chapter 45-10, display group 125. – Carry out the Electrical Test, test step no. 6 ⇒ Chapter 45-15. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Perform self-diagnosis of the dash panel insert ⇒ Electrical System; Rep. Gr. 90.
01321 Airbag control unit -J234	No communication	– Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Read out fault memory of the airbag control unit ⇒ Body Work; Rep. Gr. 01

Read-out on display -V.A.G 1552-		Rectifying fault
01418 Vehicle stability program switch valve -1- N225		– Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
01419 Vehicle stability program switch valve -2- N226		
01420 Vehicle stability program high pressure valve -1- N227		
01421 Vehicle stability program high pressure valve -2- N228		

Read-out on display -V.A.G 1552-		Rectifying fault
01423 Lateral acceleration sender -G200		– Check fitting position of the lateral acceleration sender -G200- ⇒ Chapter 45-16. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Read measured value block ⇒ Chapter 45-10, display group 005; replace lateral acceleration sender -G200- if necessary ⇒ Chapter 45-16. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
	Electrical fault in the circuit	– Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Read measured value block ⇒ Chapter 45-10, display group 005; replace lateral acceleration sender -G200- if necessary ⇒ Chapter 45-16. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
	Implausible signal	– Read the measured value block ⇒ Chapter 45-10, display group 005. – Check attachment of the lateral acceleration sender -G200- ⇒ Chapter 45-16. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Erase fault memory ⇒ Chapter 45-5, perform test drive and again interrogate fault memory ⇒ Chapter 45-5. If the fault occurs again: – Replacing lateral acceleration sender -G200- ⇒ Chap. 45-16. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
01424 Yaw rate sender -G202, signal line	Electrical fault in the circuit	– Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Read measured value block ⇒ Chapter 45-10, display group 005; replace yaw rate sender -G202- if necessary ⇒ Chapter 45-16. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
01425 Yaw rate sender -G202, reference line	Electrical fault in the circuit	

Read-out on display -V.A.G 1552-		Rectifying fault
01435 Brake pressure sender 1 -G201		– Read the measured value block ⇒ Chapter 45-10, display groups 002 and 005. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Replacing brake pressure sender 1 -G201- ⇒ Chap. 45-17. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
	Electrical fault in the circuit	– Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Read the measured value block ⇒ Chapter 45-10, display group 005. – Replacing brake pressure sender 1 -G201- ⇒ Chap. 45-17. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
	Implausible signal	– Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Read measured value block ⇒ Chapter 45-10, display group 005; replace brake pressure sender 1 -G201- if necessary ⇒ Chapter 45-17. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.

Read-out on display -V.A.G 1552-		Rectifying fault
01542 Yaw rate sender -G202	defective	– Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Read measured value block ⇒ Chapter 45-10, display group 005; replace yaw rate sender -G202- if necessary ⇒ Chapter 45-16. If the fault has still not been corrected: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
	Implausible signal	– Read the measured value block ⇒ Chapter 45-10, display group 005. – Check attachment of the yaw rate sender -G202- ⇒ Chapter 45-16. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Erase fault memory ⇒ Chapter 45-5, perform test drive and again interrogate fault memory. If the fault occurs again: – Replacing yaw rate sender -G202- ⇒ Chap. 45-16. If none of the above measures results in elimination of the fault: – Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.
01826 (Information in the literature) Note: ♦ This fault concerns the voltage supply of the steering angle sender -G85-.		– Test fuse 1. – Test wiring and plug connections to the steering angle sender -G85- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test battery, charge if necessary ⇒ Electrical System; Rep. Gr. 27.
18055 Inspect coding/variants of the control units in the drive train		– Coding ABS with EDL control unit -J104- ⇒ Chapter 45-8. – Test the control unit coding ⇒ Engine - Fuel Injection; Rep. Gr. 01. – Check coding of the gearbox control unit ⇒ automatic gearbox 001; Rep. Gr. 01.
18256 Please read out fault memory of the engine CU		– Read out fault memory of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.
18263 Data bus drive	Software status monitoring	– Performing automatic test sequence ⇒ Chapter 45-5. – Make sure the control units connected to the data BUS cables have no entry in the fault memory. – Check whether the correct engine control unit and the right ABS with EDL control unit -J104- (spare part number) have been fitted.

Read-out on display -V.A.G 1552-		Rectifying fault
18265 Load signal		– Read out fault memory of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.
65535 Control unit defective		– Replacing control unit ABS with EDL control unit -J104- ⇒ Chapter 45-17.

45-7 Fault table - ABS systems BOSCH 8.0

Note

- *As the control units are interlinked over two data BUS lines, always start fault finding by activating the function „Automatic test sequence“ ⇒ Chap. 45-5 on all control units fitted to the vehicle This allows to interrogate all the control units fitted on the vehicle to determine their possible faults.*
- *All the possible faults which can be detected by the ABS control unit -J104- and which can be displayed on vehicle system tester -V.A.G 1552- during interrogation of the fault memory content, are listed below.*
- *The fault table is ordered according to the 5-digit fault code on the left.*
- *The fault table may also display the fault type.*
- *Before replacing acomponent fault to be faulty test all corresponding plug connections, lines and earth connection according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.*
- *After carrying out the repair always interrogate and erase the fault memory using vehicle system tester -V.A.G 1552- and perform a test drive (at a speed above 20 km/h).*
- *After the test drive interrogate the fault memory again.*

Read-out on display -V.A.G 1552-		**Rectifying fault**
no fault detected		If after repair „No fault detected“ is displayed, the self-diagnosis is completed. If in spite of display read-out „No fault detected“ the ABS does not operate without fault, proceed as follows: 1. Perform a test drive at a speed above 20 km/h, 2. interrogate the fault memory again, if still no fault is stored,
00003 Control unit defective		– Replacing hydraulic control unit ⇒ Chap. 45-18.
00257 ABS FL- N101 inlet valve		– Performing a final control diagnosis, function 03 ⇒ Chapter 45-12. – Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. If none of the above measures results in elimination of the fault: – Replacing hydraulic control unit ⇒ Chap. 45-18.
00259 ABS FR -N99 inlet valve		
00265 ABS FL- N102 outlet valve		
00267 ABS FR- N100 outlet valve		
00273 ABS RR -N133 inlet valve		
00274 ABS RL -N134 inlet valve		
00275 ABS RR -N135 outlet valve		
00276 ABS RL -N136 outlet valve		

Read-out on display -V.A.G 1552-		Rectifying fault
00283 Speed sensor vl-G47	Mechanical fault Implausible signal Electrical fault in the circuit	– Read the measured value block ⇒ Chapter 45-11, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the front left speed sensor -G47- and sensor ring for damage. – Replace the speed sensor -G47- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing hydraulic control unit ⇒ Chap. 45-18.
00285 Speed sensor vr-G45	Mechanical fault Implausible signal Electrical fault in the circuit	– Read the measured value block ⇒ Chapter 45-11, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the front right speed sensor -G45- and sensor ring for damage. – Replace the speed sensor -G45- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing hydraulic control unit ⇒ Chap. 45-18.
00287 Speed sensor hr-G44	Mechanical fault Implausible signal Electrical fault in the circuit	– Read the measured value block ⇒ Chapter 45-11, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the rear right speed sensor -G44- and sensor ring for damage. – Replace the speed sensor -G44- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing hydraulic control unit ⇒ Chap. 45-18.
00290 Speed sensor hl-G46	Mechanical fault Implausible signal Electrical fault in the circuit	– Read the measured value block ⇒ Chapter 45-11, display group 001. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Check the rear left speed sensor -G46- and sensor ring for damage. – Replace the speed sensor -G46- or the sensor ring as required ⇒ Chapter 45-19. If the fault occurs again: – Replacing hydraulic control unit ⇒ Chap. 45-18.

Read-out on display -V.A.G 1552-		Rectifying fault
00301 Return flow pump for ABS - V39	Implausible signal	– Read the measured value block ⇒ Chapter 45-11, display group 006. – Perform actuator diagnosis ⇒ Chapter 45-12. – Check fuse, wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. If the fault occurs again: – Replacing hydraulic control unit ⇒ Chap. 45-18.
00493 ESP sensor unit -G419	no signal/communication Implausible signal	– Read the measured value block ⇒ Chapter 45-11, display groups 005 or 126. – Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. If none of the above measures results in elimination of the fault: – Replacing ESP sensor unit -G419- ⇒ Chapter 45-16.
00526 Brake light switch -F	Implausible signal Open circuit	– Read the measured value block ⇒ Chapter 45-11, display group 002. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Replacing brake light switch -F- ⇒ Chap. 45-16.
00532 Supply voltage Note: ♦ This fault is related to the voltage supply of the control unit. ♦ This fault is only stored if it occurs at a vehicle speed above 6 km/h.	Signal too low	– Read the measured value block ⇒ Chapter 45-11, display group 006. – Determine and eliminate open circuit in voltage supply ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test battery, AC generator and voltage regulator ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. The ABS, ABS/TCS or ABS/TCS/ESP system is switched on again as soon as the vehicle voltage exceeds 10 volts and the warning lights go out. – Test earth connections. If no fault is found in the voltage supply: – Replacing hydraulic control unit ⇒ Chap. 45-18.
00597 Different wheel speed pulses	Mechanical fault	– Test wheels and tyre pressures ⇒ Chapter 00-4. – Check the fitting position of the speed sensor and wheel bearing with sensor ring and replace if necessary ⇒ Chapter 40-3 or ⇒ Chapter 42-3.
00753 Electr. connections wheel speed pulses	Short circuit to positive Electrical fault in the circuit	– Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.

Read-out on display -V.A.G 1552-		Rectifying fault
00778 Steering angle sender - G85	defective	– Read the measured value block ⇒ Chapter 45-11, display groups 005 and 125. – Perform null balance of the steering angle sender -G85- ⇒ Chapter 45-14. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – If necessary replace steering angle sender -G85- ⇒ Chap. 45-16.
	No or incorrect basic setting/adaption	– Perform null balance of the steering angle sender -G85- ⇒ Chapter 45-14.
	no signal/communication	– Read the measured value block ⇒ Chapter 45-11, display group 125. – Check wiring and plug connections according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
	Implausible signal	– Read the measured value block ⇒ Chapter 45-11, display group 005. – Check fitting position of the steering angle sender -G85- ⇒ Chapter 45-16. – Carry out check of chassis alignment ⇒ Chapter 44-2 – Perform null balance of the steering angle sender -G85- ⇒ Chapter 45-14.
01044 Control unit wrongly coded		– Coding ABS with EDL control unit -J104- ⇒ Chapter 45-9.
01119 Signal for gear recognition		– Performing automatic test sequence ⇒ Chapter 45-5.
01130 ABS operation		– Erasing fault memory (05) ⇒ Chapter 45-5. – Ending output (06) ⇒ Chapter 45-5. – Switch off ignition. – Switch on ignition. – Interrogating fault memory (02) ⇒ Chap. 45-5. If the fault occurs again: – Replacing hydraulic control unit ⇒ Chap. 45-18.
01200 Power supply for ABS valves Note: ♦ This fault concerns the voltage supply of the valves of the hydraulic unit -N55-.		– Test relay for solenoid valves, read measured value block ⇒ Chapter 45-11, display group 006. – Determine and eliminate open circuit in voltage supply ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test battery, AC generator and voltage regulator ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. If no fault is found in the voltage supply: – Performing a final control diagnosis, function 03 ⇒ Chapter 45-12.

Read-out on display -V.A.G 1552-		Rectifying fault
01201 Power supply for ABS pump Note: ♦ This fault concerns the voltage supply of the return flow pump for ABS -V39-.		– Test relay for return flow pump for ABS -V39-, read measured value block ⇒ Chapter 45-11, display group 006. – Determine and eliminate open circuit in voltage supply ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test battery, AC generator and voltage regulator ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. If no fault is found in the voltage supply: – Performing a final control diagnosis, function 03 ⇒ Chapter 45-12.
01312 Drive databus	defective [1]	– Coding ABS with EDL control unit -J104- ⇒ Chapter 45-9. – Test the control unit coding ⇒ Engine - Fuel Injection; Rep. Gr. 01. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90
	defect sporadic [1]	– Erasing fault memory ⇒ Chapter 45-5. – No further measures required. – Inform customer.

[1] The fault does not result in the ABS warning lamp -K47- or the dual circuit and hand brake system warning lamp -K7- lighting up. The ABS function is fully maintained.

Read-out on display -V.A.G 1552-		Rectifying fault
01314 Engine control unit	no signal/communication	– Read the measured value block ⇒ Chapter 45-11, display group 125. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Perform self-diagnosis of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.
	please read out fault memory	– Read out fault memory of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.
01315 Gearbox control unit	no signal/communication	– Read the measured value block ⇒ Chapter 45-11, display group 125. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Perform self-diagnosis of the gearbox control unit ⇒ automatic gearbox 001; Rep. Gr. 01.
	please read out fault memory	– Read out the fault memory of the automatic gearbox control unit ⇒ Automatic Gearbox; Rep. Gr. 01.
01317 Control unit with display in dash panel insert -J285	no signal/communication	– Read the measured value block ⇒ Chapter 45-11, display group 125. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Perform self-diagnosis of the dash panel insert ⇒ Electrical System; Rep. Gr. 90.

Read-out on display -V.A.G 1552-		Rectifying fault
01321 Airbag control unit -J234	no signal/communication	– Read the measured value block ⇒ Chapter 45-11, display group 127. – Testing data BUS ⇒ Electrical system; Rep. Gr. 90 – Perform self-diagnosis for airbag system ⇒ Body Work; Rep. Gr. 01
01418 Vehicle stability program switch valve -1- N225		– Check wiring and plug connections to the ABS control unit -J104- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Performing a final control diagnosis, function 03 ⇒ Chapter 45-12. – Replacing hydraulic control unit ⇒ Chap. 45-18.
01419 Vehicle stability program switch valve -2- N226		
01420 Vehicle stability program high pressure valve -1- N227		
01421 Vehicle stability program high pressure valve -2- N228		
01435 Brake pressure sender 1 - G201	Implausible signal	– Read the measured value block ⇒ Chapter 45-11, display group 005. – Erasing fault memory (05) ⇒ Chapter 45-5. – Ending output (06) ⇒ Chapter 45-5. – Switch off ignition. – Switch on ignition. If the fault occurs again: – Replacing hydraulic control unit ⇒ Chap. 45-18.
01486 System function test activated		– Perform or end ESP road and system test ⇒ Chap. 45-14
01683 Wheel speed signals/ speed		– Test wheels and tyre pressures ⇒ Chapter 00-4. – Check the fitting position of the speed sensor and wheel bearing with sensor ring and replace if necessary ⇒ Chapter 40-3 or ⇒ Chapter 42-3. – Check wiring and plug connections for the speed sensor according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
01765 Engine control unit control difference		– Perform self-diagnosis of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.

Read-out on display -V.A.G 1552-		Rectifying fault
01766 Brake control unit control difference	Implausible signal	– Perform ESP road and system test ⇒ Chap. 45-14 – Erasing fault memory (05) ⇒ Chapter 45-5. – Ending output (06) ⇒ Chapter 45-5. – Switch off ignition. – Switch on ignition. If the fault occurs again: – Perform self-diagnosis of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.
01826 Steering angle sender -G85, voltage supply KL30 Note: ♦ This fault is stored, if the steering angle sender -G85- is separated from the voltage supply or the onboard voltage is NOK.		– Test wiring and plug connections to the steering angle sender -G85- according to the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Test battery, AC generator and voltage regulator ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations. – Perform test drive or null balance of the steering angle sender -G85- ⇒ Chapter 45-14. – Erasing fault memory (05) ⇒ Chapter 45-5. – Ending output (06) ⇒ Chapter 45-5. – Switch off ignition. – Switch on ignition. If the fault occurs again: – Replace steering angle sender -G85- ⇒ Chap. 45-16.
01827 Control unit with display in dash panel insert -J285, wheel circumference implausible		– Perform self-diagnosis of the dash panel insert ⇒ Electrical System; Rep. Gr. 90.
16347 Control unit defective		– Replacing hydraulic control unit ⇒ Chap. 45-18.
18055 Inspect coding/variants of the control units in the drive train		– Coding ABS with EDL control unit -J104- ⇒ Chapter 45-9. – Test the control unit coding ⇒ Engine - Fuel Injection; Rep. Gr. 01. – Check coding of the gearbox control unit ⇒ automatic gearbox 001; Rep. Gr. 01.
18265 Load signal		– Read out fault memory of the engine control unit ⇒ Engine - Fuel Injection; Rep. Gr. 01.

45-8 Code control unit - ABS systems BOSCH 5.7

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-

The control unit built into the vehicle is coded. New control units supplied through the spares warehouse are not coded and must be coded after being installed.

Perform coding with the vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform coding with the vehicle system tester -V.A.G 1552-

Precondition for coding

Coding is only then possible if the workshop code (WSC) has been entered into the vehicle system tester -V.A.G 1552- and when function 11 „Coding 2“ was also successfully performed on vehicles with ABS/EDL/TCS/ESP.

Test sequence

– Determine the engine identification characters and the type of ABS hydraulic control unit fitted on the vehicle.
– Connect up vehicle system tester -V.A.G 1552- and enter the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chapter 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Select function 0 7 „code the control unit“ and confirm with Q.

Readout on display:

```
Coding control unit
Enter code number  XXXXX
```

– Enter the relevant code number of the vehicle and confirm with Q.

Table of codes ⇒ 45-8 page 1

Table of codes

Engine	Engine identification characters	ABS control unit identification number	ABS version	Code number	Gearbox
1.0 litre/37 kW	AQV, ARV	6Q0614117	ABS	00036	Gearbox
		6Q0907379	ABS	00044	
		6Q0907379C	ABS	00044	
		6Q0907379G	ABS	00044	
1.2 ltr./40 kW	AWY	6Q0907379G	ABS	00044	Gearbox

Engine	Engine identification characters	ABS control unit identification number	ABS version	Code number	Gearbox
1.2 ltr./47 kW	AZQ	6Q0907379G	ABS	00044	Gearbox
1.4 ltr./44 kW	AZF, AZE	6Q0907379	ABS	00044	Gearbox
		6Q0907379C	ABS	00044	
		6Q0907379G	ABS	00044	
1.4 ltr./50 kW	AQW, AME, ATZ	6Q0614117	ABS	00036	Gearbox
		6Q0614417	TCS	00052	
		6Q0907379	ABS	00044	
		6Q0907379A	TCS	00060	
		6Q0907379C	ABS	00044	
		6Q0907379D	TCS	00060	
		6Q0907379G	ABS	00044	
		6Q0907379H	TCS	00060	
1.4 ltr./55 kW	AUA, BBY	6Q0614117	ABS	00036	Gearbox
		6Q0614417	TCS	00116	
		6Q0907379	ABS	00044	
		6Q0907379A	TCS	00124	
		6Q0907379C	ABS	00044	Gearbox
		6Q0907379C	ABS	00045	Automatic gearbox
		6Q0907379D	TCS	00124	Gearbox
		6Q0907379D	TCS	00125	Automatic gearbox
		6Q0907379G	ABS	00044	Gearbox
		6Q0907379G	ABS	00045	Automatic gearbox
		6Q0907379H	TCS	00124	Gearbox
		6Q0907379H	TCS	00125	Automatic gearbox
		6Q0907379Q	ESP	03453	Gearbox
		6Q0907379Q	ESP	03485	Automatic gearbox
1.4 ltr./74 kW	AUB, BBZ	6Q0614117	ABS	00036	Gearbox
		6Q0614417	TCS	00116	
		6Q0907379	ABS	00044	
		6Q0907379A	TCS	00124	
		6Q0907379C	ABS	00044	
		6Q0907379D	TCS	00124	
		6Q0907379G	ABS	00044	
		6Q0907379H	TCS	00124	
		6Q0907379Q	ESP	03386	

Engine	Engine identification characters	ABS control unit identification number	ABS version	Code number	Gearbox
2.0 ltr./85 kW	AZL	6Q0907379	ABS	00044	Gearbox
		6Q0907379A	TCS	00188	
		6Q0907379C	ABS	00044	
		6Q0907379D	TCS	00188	
		6Q0907379G	ABS	00044	
		6Q0907379H	TCS	00188	
		6Q0907379M	ESP	03338[1)]	
		6Q0907379M	ESP	03341[2)]	
		6Q0907379M	ESP	03344[3)]	
		6Q0907379Q	ESP	03338	
1.9 ltr./47 kW SDI	ASY	6Q0907379	ABS	00044	Gearbox
		6Q0907379C	ABS	00044	
		6Q0907379G	ABS	00044	
1.9 ltr./74 kW TDI PD	ATD	6Q0614417	TCS	00180	Gearbox
		6Q0907379	ABS	00044	
		6Q0907379A	TCS	00188	
		6Q0907379C	ABS	00044	
		6Q0907379D	TCS	00188	
		6Q0907379G	ABS	00044	
		6Q0907379H	TCS	00188	
		6Q0907379Q	ESP	03411	
1.4 ltr./55 kW TDI PD	AMF	6Q0907379Q	ESP	03479	Gearbox
		6Q0907379G	ABS	00044	
		6Q0907379H	TCS	00188	
1.9 ltr./96 kW TDI PD	ASZ	6Q0907379Q	ESP	03357	Gearbox
		6Q0907379G	ABS	00044	
		6Q0907379H	TCS	00188	

1) Fabia
2) Fabia Sedan
3) Fabia estate car

The control unit coding is shown in the display, example 00116:

```
6Q0614117   TCS 5.7   Front   X00     ->
Coding 00116                        WSC XXXXX
```

– Press [→].

Readout on display:

```
Vehicle system test                 HELP
Select function XX
```

Only on vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

– Select function [1] [1] „Coding 2“ and confirm with [Q].

Readout on display:

```
Coding 2
Enter code number  XXXXX
```

Note

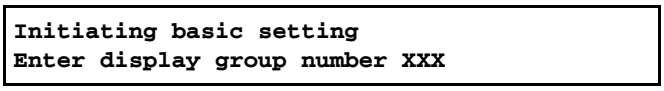
The steering wheel must be in the straight ahead position before executing the function „Coding 2“.

– Enter code number 40168 and confirm with Q.

Readout on display:

– Select function 0 4 „initiate basic setting“ and confirm entry with Q.

Readout on display:



– Select display group 0 0 1 and confirm with Q.
– Switch off the ignition for about 2 seconds.
– Switch on ignition.

Note

The vehicle system tester -V.A.G 1552- must remain connected up while the ignition is switched off.

Readout on display:

Continued for all vehicles

– Press 0 6 for the function „End output“ and confirm with Q.

Readout on display:

Note

- *The ABS warning light -K47- and the dual circuit and hand brake system warning light -K7- will light up and will remain lit up if the control unit is incorrectly coded.*
- *At the same time, an entry is recorded in the fault memory ⇒ Chap. 45-5.*

45-9 Code control unit - ABS BOSCH 8.0

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-

The control unit built into the vehicle is coded. New control units supplied through the spares warehouse are not coded and must be coded after being installed.

Perform coding of vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform coding with the vehicle system tester -V.A.G 1552-

Coding requirements

Coding is only then possible if the workshop code (WSC) has been entered into the vehicle system tester -V.A.G 1552- and when function 16 „access authorisation“ was also successfully performed.

Test sequence

– Determine the engine identification characters and the type of ABS hydraulic control unit fitted on the vehicle.
– Connect up vehicle system tester -V.A.G 1552- and enter the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chapter 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Select function 0 7 „code the control unit“ and confirm with Q.

Readout on display:

```
Coding control unit
Enter code number  XXXXXXX
```

– Enter the relevant code number of the vehicle and confirm with Q.

Table of codes ⇒ 45-9 page 2

Table of codes

Engine	Engine identification characters	ABS control unit identification number	ABS version	Brakes at the front axle	Brakes at the rear axle	Code number	Gearbox
1.2 ltr./40 kW	AWY, BMD	6Q0907379R	ABS	13” FS-II	Drum brake	0000005	Gearbox
		6Q0907379R	ABS	14” FS-III	Drum brake	0000005	
		6Q0907379AA	ABS	13” FS-II	Drum brake	0000005	
		6Q0907379AA	ABS	14” FS-III	Drum brake	0000005	
		6Q0907379AF	ABS	13” FS-II	Drum brake	0002058	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002100	
1.2 ltr./47 kW	AZQ, BME	6Q0907379R	ABS	14” FS-III	Drum brake	0000005	Gearbox
		6Q0907379AA	ABS	14” FS-III	Drum brake	0000005	
		6Q0907379AF	ABS	13” FS-II	Drum brake	0002061	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002103	
		6Q0907379S	TCS	14” FS-III	Drum brake	0000005	
		6Q0907379AB	TCS	14” FS-III	Drum brake	0000005	
		6Q0907379AG	TCS	13” FS-II	Drum brake	0002061	
		6Q0907379AG	TCS	14” FS-III	Drum brake	0002103	
		6Q0907379AH	ESP	14” FS-III	Drum brake	0000428	
		6Q0907379T	ESP	14” FS-III	Drum brake	0000428	
1.4 ltr./55 kW	AUA, BBY, BKY	6Q0907379R	ABS	14” FS-III	Drum brake	0000005	Gearbox
		6Q0907379AA	ABS	14” FS-III	Drum brake	0000005	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002106	
		6Q0907379S	TCS	14” FS-III	Drum brake	0000005	
		6Q0907379AB	TCS	14” FS-III	Drum brake	0000005	
		6Q0907379AG	TCS	14” FS-III	Drum brake	0002106	
		6Q0907379T	ESP	14” FS-III	Drum brake	0000425	
		6Q0907379AH	ESP	14” FS-III	Drum brake	0000425	
		6Q0907379R	ABS	14” FS-III	Drum brake	0000011	Automatic gearbox
		6Q0907379AA	ABS	14” FS-III	Drum brake	0000011	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002127	
		6Q0907379S	TCS	14” FS-III	Drum brake	0000011	
		6Q0907379AB	TCS	14” FS-III	Drum brake	0000011	
		6Q0907379AG	TCS	14” FS-III	Drum brake	0002127	
		6Q0907379T	ESP	14” FS-III	Drum brake	0000440	
		6Q0907379AH	ESP	14” FS-III	Drum brake	0000440	

Engine	Engine identification characters	ABS control unit identification number	ABS version	Brakes at the front axle	Brakes at the rear axle	Code number	Gearbox
1.4 ltr./74 kW	AUB, BBZ	6Q0907379R	ABS	14” FS-III	Disc brake	0000005	Manual gearbox
		6Q0907379AA	ABS	14” FS-III	Disc brake	0000005	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002109	
		6Q0907379AF	ABS	14” FS-III	Disc brake	0002178	
		6Q0907379S	TCS	14” FS-III	Disc brake	0000005	
		6Q0907379AB	TCS	14” FS-III	Disc brake	0000005	
		6Q0907379AG	TCS	14” FS-III	Drum brake	0002109	
		6Q0907379AG	TCS	14” FS-III	Disc brake	0002178	
		6Q0907379AH	ESP	14” FS-III	Disc brake	0000329	
		6Q0907379T	ESP	14” FS-III	Disc brake	0000329	
2.0 ltr./85 kW	AZL	6Q0907379AA	ABS	15” C54-II	Disc brake	0000008	Gearbox
		6Q0907379R	ABS	15” C54-II	Disc brake	0000008	
		6Q0907379AB	TCS	15” C54-II	Disc brake	0000008	
		6Q0907379AG	TCS	15” C54-II	Disc brake	0002226	
		6Q0907379S	TCS	15” C54-II	Disc brake	0000008	
		6Q0907379T	ESP	15” C54-II	Disc brake	0000275	
		6Q0907379AH	ESP	15” C54-II	Disc brake	0000275	
1.4 ltr./55 kW TDI PD	AMF	6Q0907379R	ABS	14” FS-III	Drum brake	0000008	Gearbox
		6Q0907379AA	ABS	14” FS-III	Drum brake	0000008	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002148	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002151	
		6Q0907379S	TCS	14” FS-III	Drum brake	0000008	
		6Q0907379AB	TCS	14” FS-III	Drum brake	0000008	
		6Q0907379AG	TCS	14” FS-III	Drum brake	0002148	
		6Q0907379AG	TCS	14” FS-III	Drum brake	0002151	
		6Q0907379T	ESP	14” FS-III	Drum brake	0000431	
		6Q0907379AH	ESP	14” FS-III	Drum brake	0000431	
		6Q0907379AH	ESP	14” FS-III	Drum brake	0000437	
1.9 ltr./47 kW SDI	ASY	6Q0907379R	ABS	14” FS-III	Drum brake	0000008	Gearbox
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002142	
		6Q0907379AA	ABS	14” FS-III	Drum brake	0000008	
1.9 ltr./74 kW TDI PD	ATD	6Q0907379R	ABS	14” FS-III	Disc brake	0000008	Gearbox
		6Q0907379AA	ABS	14” FS-III	Disc brake	0000008	
		6Q0907379AF	ABS	14” FS-III	Disc brake	0002196	
		6Q0907379AF	ABS	14” FS-III	Drum brake	0002154	
		6Q0907379S	TCS	14” FS-III	Disc brake	0000008	
		6Q0907379AB	TCS	14” FS-III	Disc brake	0000008	
		6Q0907379AG	TCS	14” FS-III	Disc brake	0002196	
		6Q0907379AG	TCS	14” FS-III	Drum brake	0002154	
		6Q0907379T	ESP	14” FS-III	Disc brake	0000365	
		6Q0907379AH	ESP	14” FS-III	Disc brake	0000365	

Engine	Engine identification characters	ABS control unit identification number	ABS version	Brakes at the front axle	Brakes at the rear axle	Code number	Gearbox
1.9 ltr./96 kW TDI PD	ASZ	6Q0907379AF	ABS	15” C54-II	Disc brake	0002229	Gearbox
		6Q0907379AA	ABS	15” C54-II	Disc brake	0000008	
		6Q0907379R	ABS	15” C54-II	Disc brake	0000008	
		6Q0907379S	TCS	15” C54-II	Disc brake	0000008	
		6Q0907379AB	TCS	15” C54-II	Disc brake	0000008	
		6Q0907379AG	TCS	15” C54-II	Disc brake	0002229	
		6Q0907379AH	ESP	15” C54-II	Disc brake	0000296	
		6Q0907379T	ESP	15” C54-II	Disc brake	0000296	

The read-out on display is the control unit coding, e.g. 0000365):

```
6Q0907379T   ESP 8.0   front   X00     -
Coding 0000365                 WSC XXXXX
```

– Press (→).

Readout on display:

```
Vehicle system test                HELP
Select function XX
```

only on vehicles with ABS/TCS/ESP BOSCH 8.0

– Function (1) (6) select „access authorisation“ and confirm with (Q).

Readout on display:

```
Access authorisation
Enter code number  XXXXX
```

Note

The steering wheel must be in the straight ahead position before executing the function „access authorisation“.

– Enter code number 40168 and confirm with (Q).

Readout on display:

```
Vehicle system test                HELP
Select function XX
```

– Select function (0) (4) „initiate basic setting“ and confirm entry with (Q). Readout on display:

Readout on display:

```
Initiating basic setting
Enter display group number      XXX
```

– Select display group (0) (0) (1) and confirm with (Q).

Readout on display:

```
Basic setting        1    EIN <8-OFF>
Bal. steer. angl. send. O.K.
```

Null balance steering angle sender -G85- is performed successfully.

– Switch off the ignition for about 2 seconds.

– Switch on ignition.

Note

The vehicle system tester -V.A.G 1552- must remain connected up while the ignition is switched off.

– Check straight-ahead position using function 8 „read measured value block“ ⇒ Chap. 45-11, display group number 005.

Continued for all vehicles

– Press 0 6 for the function „End output“ and confirm with Q.

Readout on display:

```
Vehicle system test                    HELP
Enter address word XX
```

Note

- *The ABS warning light -K47- and the dual circuit and hand brake system warning light -K7- will light up and will remain lit up if the control unit is incorrectly coded.*
- *At the same time, an entry is recorded in the fault memory ⇒ Chap. 45-5.*

45-10 Reading measured value block - BOSCH 5.7

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-

The control unit can transmit many measured values. These measured values provide information about the operating condition of the system or the connected sensors. In many cases the transmitted measured values are useful for fault finding and fault elimination.

As all measured values cannot be analysed simultaneously they are concentrated in individual display groups, which can be selected via display group numbers.

Safety measures

If test and measuring devices are required during test drives observe the following:

- Always secure the test and measuring devices on the rear seat and have a second person operate them there.
- If the test and measuring devices are operated from the passenger seat, the passenger could be injured by the release of the passenger airbag in the event of an accident.

Test sequence and test tables with measured values

Perform with the vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform with the vehicle system tester -V.A.G 1552-

– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 0 and 8 for the function „Read measured value block“ and confirm with Q.

Readout on display:

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

– Enter display group number ⇒ 45-10 page 2.

What now appears in the display is the measured value block selected in standardised form.

Note

To switch to another display group proceed as follows:

Display group number	-V.A.G 1551-	-V.A.G 1552-
higher	Press 3	Press ↑
lower	Press 1	Press ↓
skip	Press C	Press C

– If the specifications are achieved in all the display fields, press →.
– Press 0 and 6 for the function „End output“ and confirm with Q.

Display group number 001:

The current wheel speeds are displayed. They serve to check the speed sensor assignment relatively to the wheel (to this end raise the vehicle and turn the wheel by hand).

Reading measured value block 1 →				Readout on display
0 km/h	0 km/h	0 km/h	0 km/h	
			Rear right wheel speed (km/h)	
		Rear left wheel speed (km/h)		
	Front right wheel speed (km/h)			
Front left wheel speed (km/h)				

Display group number 002:

vehicles with ABS, ABS/EDL/TCS BOSCH 5.7

Reading measured value block 2 →			Readout on display
0	0	1	
		not assigned	
		Relay for solenoid valves of ABS -J106- ♦ 0 - Not allowed during the function „Read measured value block“. The relay was not activated with „ignition on“. ♦ 1 - Specified value; with „ignition on“ the relay was activated by the ABS with EDL control unit -J104-.	
	Return flow pump for ABS -V39- ♦ 0 - Specified value; no voltage on return flow pump motor. ♦ 1 - Not allowed during the function „Read measured value block“. Voltage present on return flow pump motor.		
Brake light switch -F- ♦ 0 - Brake pedal not actuated ♦ 1 - Brake pedal operated, if deviation carry out electrical test, test step No. 4 ⇒ Chap. 45-15.			

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

Reading measured value block 2 →				Readout on display
0	0	activated	0	

TCS and ESP push-button -E256-

- 0 - Switch not operated
- operated - switch operated, if deviation: Carry out electrical test, test step No. 5 ⇒ Chap. 45-15

Switch for hand-brake control -F9-

- 0 - Hand brake not appied
- operated - hand brake applied, if deviation: Carry out electrical test, test step No. 7 ⇒ Chap. 45-15

Brake light switch -F-

- 0 - Brake pedal not actuated
- operated - brake pedal operated, if deviation: Carry out electrical test, test step No. 4 ⇒ Chap. 45-15

Brake pedal switch -F47-

- 0 - Brake pedal not actuated
- operated - brake pedal operated, if deviation: Carry out electrical test, test step No. 4 ⇒ Chap. 45-15

Display group number 003:

vehicles with ABS/EDL/TCS BOSCH 5.7

Note

Readout of the display group number must occur while the engine is running.

Reading measured value block 3 →			Readout on display
800 rpm	10 %	1	

not assigned

Switch for the Traction Control System -E132-

- 0 - Switch not actuated
- 1 - Button operated, if deviation: Carry out electrical test, test step No. 5 ⇒ Chap. 45-15

current engine torque

- Display range 0…100 %

Engine speed

- Display range 0…8000 rpm

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

Reading measured value block 3 →				Readout on display
770 rpm	33 Nm	33 Nm	0 %	
			Throttle valve angle ♦ Display range 0…100 %	
		Engine loss torque ♦ Display range 0…630 Nm		
	current engine torque ♦ Display range 0…630 Nm			
Engine speed ♦ Display range 0…8000 rpm				

Display group number 004:

vehicles with ABS/EDL/TCS BOSCH 5.7

Reading measured value block 4 →				Readout on display
2:50 h	0	0		
			not assigned	
		Disregard display		
	EDL disconnected because of increased brake temperature ♦ 0 - none ♦ 1 - yes			
Stationary time information ♦ too great ♦ ERROR ♦ invalid				

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

Reading measured value block 4 →	Readout on display
2:50 h on/off	
not assigned	
not assigned	
EDL disconnected because of increased brake temperature	
Stationary time information ◆ too great ◆ ERROR ◆ invalid	

Display group number 005:

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

Reading measured value block 5 →	Readout on display
0,00° 0.00°/s 1.3 bar 0.00 m/s^2	
Lateral acceleration sender -G200- ◆ Specified value for vehicle at standstill: -0,7…0.7 m/s^2 ◆ Specified value at full steering angle and at a speed of 20 km/h: -6,0…6.0 m/s^2	
Brake pressure sender 1 -G201- ◆ Specified value for not-operated brake: -7,0…7.0 bar	
Yaw rate sender -G202- ◆ Specified value for vehicle at standstill: -3,0…3.0 °/s	
Steering angle sender -G85- ◆ Specified value when driving straight ahead: -2,5…2,5°[1)]	

[1)] If a speed of 20 km/h is exceeded self-diagnosis is discontinued by the ABS with EDL control unit -J104-.

Display group number 006:

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

Reading measured value block 6 →				Readout on display
12.7 V	on	off	WSC XXXXX	
				Workshop code ⇒ operating instructions vehicle system tester -V.A.G 1552-
				Return flow pump for ABS -V39- ♦ off - Specified value; no voltage on return flow pump motor. ♦ on - Not allowed during the function „Read measured value block“. Voltage present on return flow pump motor.
				Relay for solenoid valves of ABS -J106- ♦ on - Specified value; with „ignition on“ the relay was activated by the ABS with EDL control unit -J104-. ♦ off - Not allowed during the function „Read measured value block“. The relay was not activated with „ignition on“.
				Voltage supply of the ABS with EDL control unit -J104- ♦ Specified value: 11,0…14.5 V

Display group number 125:

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

Reading measured value block 125 →				Readout on display
Steering angle 1	Engine 1	Gearbox 1	Combi 1	
				Data BUS for dash panel insert ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]
				Data BUS for gearbox control unit[2)] ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]
				Data BUS for engine control unit ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]
				Data BUS for steering angle sender ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]

1) The following fault causes may be present: Data BUS connection interrupted; data BUS wiring interchanged; steering angle sender or engine control unit or gearbox control unit or dash panel insert defective.

2) Only on vehicles equipped with an automatic gearbox.

45-11 Reading measured value block - BOSCH 8.0

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A -

The control unit can transmit many measured values. These measured values provide information about the operating condition of the system or the connected sensors. In many cases the transmitted measured values are useful for fault finding and fault elimination.

As all measured values cannot be analysed simultaneously they are concentrated in individual display groups, which can be selected via display group numbers.

Safety measures

If test and measuring devices are required during test drives observe the following:

- Always secure the test and measuring devices on the rear seat and have a second person operate them there.
- If the test and measuring equipment is operated from the front passenger seat, this can result in injuries to the persons sitting on that seat in the event of an accident which involves the front passenger airbag being deployed.

Test sequence and test tables with measured values

Perform with the vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform with the vehicle system tester -V.A.G 1552-

– Connect up vehicle system tester -V.A.G 1552- and enter the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chapter 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Select function 0 8 „Read measured value block“ and confirm the entry with key Q. Readout on display:

Readout on display:

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

– Enter display group ⇒ 45-11 page 2.

What now appears in the display is the measured value block selected in standardised form.

Note

Proceed according to the following table to switch to another display group:

Display group number	-V.A.G 1551-	-V.A.G 1552-
higher	Press 3	Press ↑
lower	Press 1	Press ↓
skip	Press C	Press C

– If the nominal values are reached in all display fields, press the key →.

– Press 0 6 for the function „End output“ and confirm with Q.

Display group number 001:

The current wheel speeds are displayed. They serve to check the speed sensor assignment relatively to the wheel (to this end raise the vehicle and turn the wheel by hand).

Reading measured value block 1 →				Readout on display
0 km/h	0 km/h	0 km/h	0 km/h	
			Rear right wheel speed (km/h)	
		Rear left wheel speed (km/h)		
	Front right wheel speed (km/h)			
Front left wheel speed (km/h)				

Display group number 002:

vehicles with ABS, ABS/TCS BOSCH 8.0

Reading measured value block 2 →				Readout on display
0	0	1		
			not assigned	
			Relay for solenoid valves of ABS -J106- ♦ 0 - Not allowed during the function „Read measured value block“. The relay was not activated with „ignition on“. ♦ 1 - Specified value; with „ignition on“ the relay was activated by the ABS with EDL control unit -J104-.	
		Return flow pump for ABS -V39- ♦ 0 - Specified value; no voltage on return flow pump motor. ♦ 1 - Not allowed during the function „Read measured value block“. Voltage present on return flow pump motor.		
	Brake light switch -F- ♦ 0 - Brake pedal not actuated ♦ 1 - Brake pedal actuated			

Vehicles with ABS//TCS/ESP BOSCH 8.0

Reading measured value block 2 →				Readout on display
0	0	activated	0	
			TCS and ESP push-button -E256- ♦ 0 - Switch not operated ♦ operated - switch operated	
			Switch for hand-brake control -F9- ♦ 0 - Hand brake not appied ♦ operated - hand brake applied	
		Brake light switch -F- ♦ 0 - Brake pedal not actuated ♦ operated - brake pedal operated		
	Brake pedal switch -F47- ♦ 0 - Brake pedal not actuated ♦ operated - brake pedal operated			

Display group number 003:

vehicles with ABS/TCS BOSCH 8.0

Note

Readout of the display group number must occur while the engine is running.

Reading measured value block 3 →	Readout on display
800 rpm 10 % 1	
	not assigned
	TCS switch -E132- ♦ 0 - Switch not actuated ♦ 1 - Switch actuated
	current engine torque ♦ Display range 0…100 %
	Engine speed ♦ Display range 0…8000 rpm

Vehicles with ABS//TCS/ESP BOSCH 8.0

Reading measured value block 3 →	Readout on display
770 rpm 33 Nm 33 Nm 0 %	
	Throttle valve angle ♦ Display range 0…100 %
	Engine loss torque ♦ Display range 0…630 Nm
	current engine torque ♦ Display range 0…630 Nm
	Engine speed ♦ Display range 0…8000 rpm

Display group number 004:

vehicles with ABS/TCS BOSCH 8.0

Reading measured value block 4 →	Readout on display
2:50 h on/off 0	
	not assigned
	Disregard display
	EDL disconnected because of increased brake temperature ♦ off - no EDL disconnected, EDL system operational ♦ on - EDL disconnected because of increased brake temperature, EDL system not operational
	Stationary time information (cooling time for brakes) ♦ Display range 0:0…255:59 - Stationary time of the vehicle after ignition off until the next ignition on ♦ ERROR - missing message from combiinstrument

Vehicles with ABS//TCS/ESP BOSCH 8.0

Reading measured value block 4 →	Readout on display
2:50 h on/off	
	not assigned
	not assigned
	EDL disconnected because of increased brake temperature ♦ off - no EDL disconnected, EDL system operational ♦ on - EDL disconnected because of increased brake temperature, EDL system not operational
	Stationary time information (cooling time for brakes) ♦ Display range 0:0…255:59 - Stationary time of the vehicle after ignition off until the next ignition on ♦ ERROR - missing message from combiinstrument

Display group number 005:

Vehicles with ABS//TCS/ESP BOSCH 8.0

Reading measured value block 5 →				Readout on display
0,00°	0.00°/s	1.3 bar	0.00 m/s²	
				Lateral acceleration sender -G200-[1)] ♦ Specified value for vehicle at standstill: -0,7…0.7 m/s² ♦ Specified value at full steering angle and at a speed of 20 km/h: -6,0…6.0 m/s²
				Brake pressure sender 1 -G201-[2)] ♦ Specified value for not-operated brake: -7,0…7.0 bar
				Yaw rate sender -G202-[1)] ♦ Specified value for vehicle at standstill: -3,0…3.0 °/s
				Steering angle sender -G85- ♦ Specified value when driving straight ahead: -2,5…2,5°[3)]

1) The sender is located in the ESP sensor unit -G419-.
2) The sender is located in the hydraulic control unit.
3) If a speed of 20 km/h is exceeded self-diagnosis is discontinued by the ABS with EDL control unit -J104-.

Display group number 006:

Vehicles with ABS//TCS/ESP BOSCH 8.0

Reading measured value block 6 →				Readout on display
12.7 V	on	off	WSC XXXXX	
				Workshop code ⇒ operating instructions vehicle system tester -V.A.G 1552-
				Return flow pump for ABS -V39- ♦ off - Specified value; no voltage on return flow pump motor. ♦ on - Not allowed during the function „Read measured value block“. Voltage present on return flow pump motor.
				Relay for solenoid valves of ABS -J106- ♦ on - Specified value; with „ignition on“ the relay was activated by the ABS with EDL control unit -J104-. ♦ off - Not allowed during the function „Read measured value block“. The relay was not activated with „ignition on“.
				Supply voltage of the ABS control unit -J104- ♦ Specified value: 11,0…14.5 V

Display group number 007 (not fitted to all vehicles)

The vehicle must be raised and the respective wheel must be turned by hand, in order to check the fitting position of the speed sensor.

Reading measured value block 7 →				Readout on display
o.k.	o.k.	o.k.	o.k.	
				Fitting position of speed sensor RR ♦ o.k. - fitting position OK ♦ n.o.k. - fitting position N.O.K. ♦ invalid - wheel does not turn
				Fitting position of the speed sensor RL ♦ o.k. - fitting position OK ♦ n.o.k. - fitting position N.O.K. ♦ invalid - wheel does not turn
				Fitting position of the speed sensor FR ♦ o.k. - fitting position OK ♦ n.o.k. - fitting position N.O.K. ♦ invalid - wheel does not turn
				Fitting position of the speed sensor FL ♦ o.k. - fitting position OK ♦ n.o.k. - fitting position N.O.K. ♦ invalid - wheel does not turn

Display group number 009:

Vehicles with ABS//TCS/ESP BOSCH 8.0

Reading measured value block 9 →			Readout on display
0	0	1.3 bar	
			not assigned
			Brake pressure sender 1 -G201-[1)] ♦ Specified value for not-operated brake: -7,0…7.0 bar
			Brake light switch -F- ♦ 0 - Brake pedal not actuated ♦ operated - brake pedal operated
			Brake pedal switch -F47- ♦ 0 - Brake pedal not actuated ♦ operated - brake pedal operated

1) The sender is located in the hydraulic control unit.

Display group number 125 (for all vehicles):

Reading measured value block 125 → Steering angle 1 1	Engine 1	Gearbox 1	Combi 1	Readout on display
				Data BUS for dash panel insert ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]
				Data BUS for gearbox control unit[2)] ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]
				Data BUS for engine control unit ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]
				Data BUS for steering angle sender ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]

1) The following fault causes may be present: Data BUS connection interrupted; data BUS wiring interchanged; steering angle sender or engine control unit or gearbox control unit or dash panel insert defective.

2) Only on vehicles fitted with automatic gearbox.

Display group number 126:

Vehicles with ABS//TCS/ESP BOSCH 8.0

Reading measured value block 126 → ESP sensors 1				Readout on display
				Data BUS ESP sensor unit -G419- ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]
				not assigned
				not assigned
				not assigned

1) The following fault causes may be present: Data BUS connection interrupted; data BUS wiring interchanged; steering angle sender or engine control unit or gearbox control unit or dash panel insert defective.

Display group number 127 (for all vehicles):

Reading measured value block 127 → Airbag 1	Readout on display
not assigned	
not assigned	
Data BUS for airbag control unit ♦ 1 - Data BUS connection is present ♦ 0 - Data BUS connection is not present[1)]	
not assigned	

1) The following fault causes may be present: Data BUS connection interrupted; data BUS wiring interchanged; steering angle sender or engine control unit or gearbox control unit or dash panel insert defective.

45-12 Final control diagnosis - ABS system BOSCH 5.7 and BOSCH 8.0

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-

The final control diagnosis is a part of the electrical test. Final control diagnosis is used to test the pump motor. It is also used to check the correct operation of the hydraulic circuits (assignment of brake pressure lines to the wheel brakes, and also the operation of the valves) to ensure they are correctly connected and are not leaking.

Note

- *The vehicle must be raised so that the wheels are clear of the ground (2nd mechanic required for rotating the wheels).*
- *It is possible to quit the test procedure at any time by pressing* C
- *After depressing the brake pedal several times, the vacuum in the brake servo unit is reduced. Greater effort is then required to operate the brake pedal in order to achieve the same fluid pressure in the brake system as with vacuum assistance.*
- *Once the vacuum in the brake servo unit has been reduced, it is possible that the wheels do not lock ⇒ start engine in order to build up vacuum in the brake servo unit.*
- *Operate vehicle system tester following the indications on the display, i.e. carry out all self-diagnosis working steps in the prescribed sequence.*
- *During actuator diagnosis do not exceed a maximum wheel speed of 10 km/h. At a higher speed the ABS with EDL control unit -J104- interrupts the actuator diagnosis.*

Example (only for vehicle system tester -V.A.G 1552-):

Read-out on display of V.A.G. 1552 during final control diagnosis:

```
Final control diagnosis            -  ->
IFL: VBAT    OFL: 0V       Wheel FL locked
```

IFL = Inlet valve front left

VBAT = V-Battery voltage, voltage present on valve

OFL = Outlet valve front left

OV = O Volt; no voltage on valve

locked/free = Wheel status; must be checked by 2nd mechanic

```
Final control diagnosis            -  ->
EDL valves/Hydr.p:V BAT Wheel FL/FR lock
```

Hydr-P = Hydraulic pump (Return flow pump)

Performing actuator diagnosis

With the vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

With the vehicle system tester -V.A.G 1552-

– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press [0] and [3] for the function „actuator diagnosis“ and confirm with [Q].

Return flow pump for ABS -V39- must run.

Note

- *On vehicles with ABS, ABS/EDL/TCS the ABS warning light -K47- flashes 2x and the dual circuit and hand brake system warning light -K7- flashes 4x per second during the next working steps.*
- *On vehicles with ABS/EDL/TCS/ESP the ABS warning light -K47- flashes 2x per second during the next working steps .*

Readout on display:

```
Final control diagnosis              -  ->
Hydraulic pump ABS -V64
```

– Press [→] within the next 60 seconds.

Readout on display:

```
Final control diagnosis              -  ->
Operate brake
```

– Operate brake pedal

– Press [→].

Readout on display:

```
Final control diagnosis              -  ->
IFL: 0V   OFL: 0V       Wheel FL locked
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press [→].

Readout on display:

```
Final control diagnosis              -  ->
IFL: VBAT    OFL: 0V       Wheel FL locked
```

– Press [→].

Return flow pump for ABS -V39- must run.

Brake pedal must not yield.

If the brake pedal yields, there is a fault in the hydraulic unit. In that case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:

```
Final control diagnosis              -  ->
IFL: VBAT    OFL: VBAT      Wheel FL free
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel locks, it is possible that the brake pressure lines to the wheel brakes are wrongly connected.

– Press (→).

Return flow pump for ABS -V39- no longer runs.

Readout on display:

```
Final control diagnosis            -  ->
IFL: VBAT    OFL: 0V        Wheel FL free
```

– Press (→).

Brake pedal must be felt to yield.

If the brake pedal does not yield, there is a fault in the hydraulic unit. In that case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:

```
Final control diagnosis            -  ->
IFL: 0V   OFL: 0V       Wheel FL locked
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
Release brake
```

– Take your foot off the brake pedal.

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
Operate brake
```

– Operate brake pedal

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
IFR: 0V   OFR: 0V       Wheel FR locked
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
IFR: VBAT   OFR: 0V       Wheel FR locked
```

– Press (→).

Return flow pump for ABS -V39- must run.

Brake pedal must not yield.

If the brake pedal yields, there is a fault in the hydraulic unit. In that case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:

```
Final control diagnosis            -  ->
IFR: VBAT   OFR: VBAT      Wheel FR free
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel locks, it is possible that the brake pressure lines to the wheel brakes are wrongly connected.

– Press (→).

Return flow pump for ABS -V39- no longer runs.

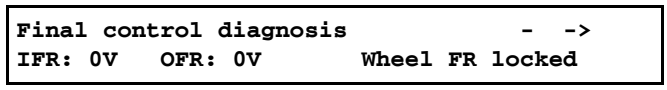
Readout on display:

– Press (→).

Brake pedal must be felt to yield.

If the brake pedal does not yield, there is a fault in the hydraulic unit. In that case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:

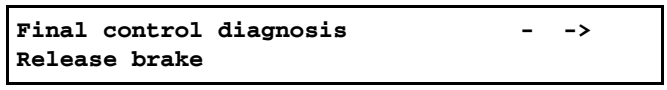


– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press (→).

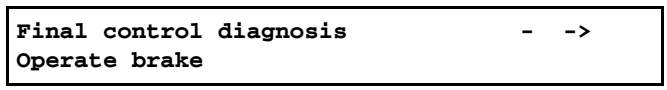
Readout on display:



– Take your foot off the brake pedal.

– Press (→).

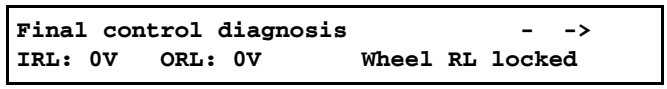
Readout on display:



– Operate brake pedal

– Press (→).

Readout on display:



– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press (→).

Readout on display:

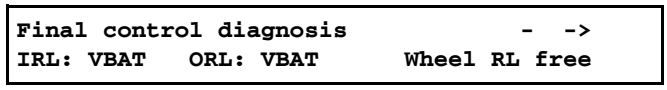
– Press (→).

Return flow pump for ABS -V39- must run.

Brake pedal must not yield.

If the brake pedal yields, there is a fault in the hydraulic unit. In that case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:



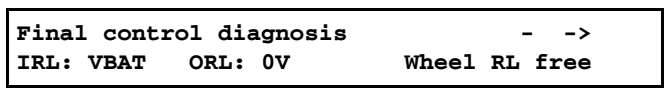
– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel locks, it is possible that the brake pressure lines to the wheel brakes are wrongly connected.

– Press (→).

Return flow pump for ABS -V39- no longer runs.

Readout on display:



– Press (→).

Brake pedal must be felt to yield.

If the brake pedal does not yield, there is a fault in the hydraulic unit. In that case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:

```
Final control diagnosis            -  ->
IRL: 0V   ORL: 0V       Wheel RL locked
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
Release brake
```

– Take your foot off the brake pedal.

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
Operate brake
```

– Operate brake pedal

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
IRR: 0V   ORR: 0V       Wheel RR locked
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press (→).

Readout on display:

```
Final control diagnosis            -  ->
IRR: VBAT   ORR: 0V       Wheel RR locked
```

– Press (→).

Return flow pump for ABS -V39- must run.

Brake pedal must not yield.

If the brake pedal yields, there is a fault in the hydraulic unit. In that case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:

```
Final control diagnosis            -  ->
IRR: VBAT   ORR: VBAT     Wheel RR free
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel locks, it is possible that the brake pressure lines to the wheel brakes are wrongly connected.

– Press (→).

Return flow pump for ABS -V39- no longer runs.

Readout on display:

```
Final control diagnosis            -  ->
IRR: VBAT   ORR: 0V       Wheel RR free
```

– Press (→).

Brake pedal must be felt to yield.

If the brake pedal does not yield, there is a fault in the hydraulic unit. In that case replace the hydraulic unit

BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

Readout on display:

```
Final control diagnosis              -  ->
IRR: 0V   ORR: 0V       Wheel RR locked
```

– Instruct the 2nd mechanic to rotate the relevant wheel by hand.

If the wheel does not lock, it is possible that there is a fault in the mechanical/hydraulic part of the brake system.

– Press (→).

Readout on display:

```
Final control diagnosis              -  ->
Release brake
```

– Take your foot off the brake pedal.

– Press (→).

Read-out on display (for vehicles with EDL):

```
Final control diagnosis              -  ->
EDL valves/Hydr. p: VBAT Wheel FL/FR lock
```

– Instruct the 2nd mechanic to rotate the relevant wheels by hand.

– If the wheels do not lock, there is a fault in the hydraulic part of the ABS system. In this case replace the hydraulic unit BOSCH 5.7 ⇒ Chap. 45-17, BOSCH 8.0 ⇒ Chap. 45-18.

– Press (→).

The warning light goes out.

Read-out on display (for vehicles with EDL):

```
Function unknown or cannot             ->
be executed at this moment
```

The final control diagnosis is ended.

– Press (→).

Readout on display:

```
Vehicle system test                   HELP
Select function XX
```

Note

- *If the ABS warning light -K47- does not go out, there is a fault in the system.*
- *Carefully follow the test sequence step by step: first interrogate the fault memory then erase.*

– End output (function 06) ⇒ Chap. 45-5.

45-13 Basic setting - ABS systems BOSCH 5.7

The function „basic setting“ performs the following tasks:

- On vehicles with ABS/EDL/TCS and ABS/EDL/TCS/ESP BOSCH 5.7 the bleeding of the hydraulic unit is performed via display group 10.
- On vehicles with ABS/EDL/TCS/ESP additionally the null balance of the steering angle sender -G85- is performed via display group 001.

– Bleeding the hydraulic unit (vehicles with ABS/EDL/TCS/ESP BOSCH 5.7) ⇒ 45-13 page 1.

– Bleeding the hydraulic unit (vehicles with ABS/EDL/TCS/ESP BOSCH 5.7) ⇒ 45-13 page 3.

– Null balance of the steering angle sender -G85- ⇒ 45-13 page 4.

– Perform vehicle and system test (vehicles with ABS/EDL/TCS/ESP BOSCH 5.7) ⇒ 45-13 page 6.

Bleeding the hydraulic unit (vehicles with ABS/EDL/TCS/ESP BOSCH 5.7)

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-
- Brake filling and bleeding device, e. g. -ROMESS S15-
- Brake fluid ⇒ Chapter 00-3

It is only necessary to carry out the basic setting if at least one chamber of the brake fluid reservoir has run completely empty, or after completing repairs to the brake system because of leaks.

Perform basic setting of vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform basic setting of the vehicle system tester -V.A.G 1552-

Note

Operate the vehicle system tester -V.A.G 1552- by referring to the read-out on the display:

WARNING!

When replenishing brake fluid with a brake filling and bleeding appliance, e.g. ROMESS S15, it is important to ensure a minimum filling pressure of 0.2 MPa (2 bar).

If the filling pressure of 0.2 MPa (2 bar) is not reached, proper bleeding of the hydraulic unit is no longer assured.

– Connect brake filling and bleeding appliance, e. g. ROMESS S15.
– Bleed brake system ⇒ Chapter 47-4.
– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press [0] and [4] for the function „basic setting“ and confirm with [Q].

Readout on display:

```
Basic setting
Enter display group number XXX
```

– First actuate the brake pedal 10x and hold brake down.
– Press [0], [1] and [0] and confirm with [Q].

Note

If you are using V.A.G. 1551 a <3> appears instead of <↑>.

Readout on display:

```
System in basic setting                10
Rel. pedal;FR+FL bleeder screws OPEN <↑>
```

– Press [↑].

Readout on display:

```
System in basic setting                11
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
System in basic setting                12
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
System in basic setting                13
Bleeder screw CLOSED              <↑>
```

– Press [↑].

Readout on display:

```
System in basic setting                14
Rel. pedal;RR+RL bleeder screws OPEN <↑>
```

– Press [↑].

Readout on display:

```
System in basic setting                15
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
System in basic setting                16
Bleeder screw CLOSED              <↑>
```

– Press [↑].

Readout on display:

```
System in basic setting                17
Part bleeding ended...
```

– Press [→].

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press [0] and [6] for the function „End output“ and confirm the entry with [Q].

Readout on display:

```
Vehicle system test                    HELP
Enter address word XX
```

– Switch off ignition.

– Separate plug connection to V.A.G. 1552.
– Bleed brake system ⇒ Chapter 47-4.
– Perform test drive with at least one ABS adjustment.

Bleeding the hydraulic unit (vehicles with ABS/EDL/TCS/ESP BOSCH 5.7)

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-
- Brake filling and bleeding device, e. g. -ROMESS S15-
- Brake fluid ⇒ Chapter 00-3

It is only necessary to carry out the basic setting if at least one chamber of the brake fluid reservoir has run completely empty, or after completing repairs to the brake system because of leaks.

Perform basic setting of vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform basic srtting of the vehicle system tester -V.A.G 1552-

Note

Operate the vehicle system tester by referring to the read-out on the display:

WARNING!

When replenishing brake fluid with a brake filling and bleeding appliance, e.g. ROMESS S15, it is important to ensure a minimum filling pressure of 0.2 MPa (2 bar).

If the filling pressure of 0.2 MPa (2 bar) is not reached, proper bleeding of the hydraulic unit is no longer assured.

– Connect brake filling and bleeding appliance, e. g. ROMESS S15.
– Bleed brake system ⇒ Chapter 47-4.
– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 0 and 4 for the function „basic setting“ and confirm with Q.

Readout on display:

```
Basic setting
Enter display group number XXX
```

– First actuate the brake pedal 10x and hold brake down.
– Press [0], [1] and [0] and confirm with [Q].

Readout on display:

```
Basic setting          10    EIN <8-OFF>
Rel. pedal;FR+FL bleeder screws OPEN <8>
```

– Press [8].

Readout on display:

```
Basic setting        10          <8-OFF>
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
Basic setting        10          <8-OFF>
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
Basic setting        10          <8-OFF>
Bleeder screw CLOSED               <8>
```

– Press [8].

Readout on display:

```
Basic setting        10          <8-OFF>
Rel. pedal;RR+RL bleeder screws OPEN <8>
```

– Press [8].

Readout on display:

```
Basic setting        10          <8-OFF>
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
Basic setting        10          <8-OFF>
Bleeder screw CLOSED               <8>
```

– Press [8].

Readout on display:

```
Basic setting        10          <8-OFF>
Part bleeding ended...
```

– Press [→].

Readout on display:

```
Vehicle system test                HELP
Select function XX
```

– Press [0] and [6] for the function „End output“ and confirm the entry with [Q].

Readout on display:

Steering angle sender

```
Vehicle system test                HELP
Enter address word XX
```

– Switch off ignition.
– Separate plug connection to V.A.G. 1552.
– Bleed brake system ⇒ Chapter 47-4.
– Perform test drive with at least one ABS adjustment.

Null balance of the steering angle sender -G85-

Null balance of the steering angle sender -G85- is required if:

♦ The ABS control unit -J104- of the steering angle sender -G85- or the steering column are replaced.
♦ Settings have been changed on the running gear within the scope of a chassis alignment.
♦ If as a result of a fault entry in the fault memory of the ABS control unit -J104- the fault table indicates a fault, perform null balance.

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B- or -V.A.G 1551/3C-

Note

For the null balance of the steering angle sender -G85- first perform function 11 „coding 2“. To do so first enter the workshop code in the vehicle system tester -V.A.G 1552-.

– Start the engine.

– Turn the steering column one turn to the right and one turn to the left.

– Perform a short test drive on an even surface. Drive straight ahead and no faster than 20 km/h, pay specific attention to the following two points:

- If the steering wheel is off straight, correct within the scope of a chassis alignment. After the alignment again perform null balance.
- If during the test drive the steering wheel is straight, stop the vehicle in its straight ahead position.

Make sure the steering wheel is not moved. Do not switch off the ignition!

– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 1 and 1 for the function „Coding 2“ and confirm with Q.

Readout on display:

```
Coding 2
Enter code number  XXXXX
```

– Enter code number 40168 and confirm entry with Q.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 0 and 4 for the function „basic setting“ and confirm with Q.

Readout on display:

```
Basic setting
Enter display group number XXX
```

– Press 0, 0 and 1 and confirm with Q.

If this appears on the display, function 11 „coding 2“ was not successfully performed.

```
Function unknown or cannot          -  ->
be carried out at the moment
```

Readout on display:

```
Basic setting     1   ON <8-OFF>      -
Bal. steer. angl. send. O.K.
```

– Check straight-ahead position using function 8 „read measured value block“ ⇒ Chap. 45-10, display group number 005.

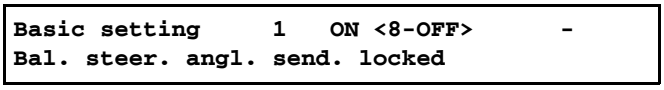
or:

Readout on display:

```
Basic setting     1   ON <8-OFF>      -
Bal. steer. angl. send. N.O.K.
```

or:

Readout on display:



1. Interrogate fault memory (Function 02)
2. Erase fault memory (Function 05)
3. End output (function 06)
4. Switch off the ignition.
5. Switch on the ignition.
6. Again perform null balance.

– Press (→).

Readout on display:

– Press (0) and (6) for the function „End output“ and confirm with (Q).

Perform ESP road and system test (vehicles with ABS/EDL/TCS/ESP BOSCH 5.7)

The ESP road test is a plausibility test of the signals from the lateral acceleration sender -G200-, yaw rate sender -G202- (both senders are integrated in one housing) and the brake pressure sender 1 -G201-.

The ESP road test should be performed after each replacement of the electrical components of the ESP system.

If the ESP road test is initiated, it can no longer be interrupted and must be performed.

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B- or -V.A.G 1551/3C-

– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

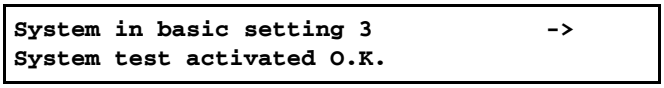
Readout on display:

– Press (0) and (4) for the function „basic setting“ and confirm with (Q).

Readout on display:

– Press (0), (0) and (3) and confirm with (Q).

Readout on display:



The ESP road and system test is activated, ESP and TCS warning light -K155- lights up.

– Press (→).

Readout on display:

– Press (0) (6) for the function „End output“ and confirm with (Q).

Readout on display:

– Disconnect vehicle system tester -V.A.G 1552-.

– Start the engine.

– Depress the brake pedal forcefully until the ESP and TCS warning light -K155- goes out, at the same time the ABS warning light -K47- lights up.

– Now perform the ESP road test.

WARNING!

- ***Observing the rules of the road traffic regulations as well as paying attention to the traffic conditions must be given top priority.***

– Drive a right or a left curve. Subsequently carry out a change of direction and drive a left or a right curve.

– After cornering, drive straight ahead for a certain period of time.

Note

- *A curve with a radius of 10 to 12 meters and a speed of 15 to 20 km/h must be driven in approx 4 seconds during cornering.*
- *It must be driven in such a way, that no ABS, EDL, TCS or ESP control is activated.*
- *If there are other traffic dependent driving manoeuvres between cornerings, they will have no influence on the ESP road test.*

If the ABS warning light -K47- goes out, the ESP road and system test was successfully performed and ended, the system is OK.

If the ABS warning light -K47- does not go out, the ESP road and system test was not successfully performed.

– Repeat the ESP road and system test ⇒ 45-13 page 6.

If the ABS warning light -K47- and the ESP and TCS warning light -K155- light up, there are faults in the system.

– Interrogate fault memory ⇒ Chap. 45-5.

45-14 Basic setting - ABS systems BOSCH 8.0

The function „basic setting“ performs the following tasks:

- On vehicles with ABS/TCS/ESP BOSCH 8.0 the bleeding of the hydraulic unit is performed via display group 10.
- On vehicles with ABS/TCS/ESP BOSCH 8.0 the null balance of the steering angle sender -G85- is performed via display group 001.
- On vehicles with ABS/TCS/ESP BOSCH 8.0 the ESP road and syystem test is performed via display group 003.

– Bleeding the hydraulic unit (vehicles with ABS/TCS/ESP BOSCH 8.0) ⇒ 45-14 page 1.

– Null balance of the steering angle sender -G85- (vehicles with ABS/TCS/ESP BOSCH 8.0) ⇒ 45-14 page 3.

– Perform road and system test (vehicles with ABS/TCS/ESP BOSCH 8.0) ⇒ 45-14 page 5.

Bleeding the hydraulic unit (vehicles with ABS/TCS/ESP BOSCH 8.0)

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-
- Brake filling and bleeding device, e. g. -ROMESS S15-
- Brake fluid ⇒ Chapter 00-3

It is only necessary to carry out the basic setting if at least one chamber of the brake fluid reservoir has run completely empty, or after completing repairs to the brake system because of leaks.

Perform basic setting of vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform basic setting of vehicle system tester -V.A.G 1552-

Note

Operate the vehicle system tester by referring to the read-out on the display:

WARNING!

When replenishing brake fluid with a brake filling and bleeding appliance, e.g. -ROMESS S15-, it is important to ensure a minimum filling pressure of 0.2 MPa (2 bar).

If the filling pressure of 2 MPa (2 bar) is not reached, proper bleeding of the hydraulic unit is no longer assured.

– Connect brake filling and bleeding device, e.g. -ROMESS S15-.

– Bleed brake system ⇒ Chapter 47-4.

– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 0 and 4 for the function „basic setting“ and confirm with Q.

Readout on display:

```
Basic setting
Enter display group number XXX
```

– First actuate the brake pedal 10x and hold brake down.

– Press 0, 1 and 0 and confirm with Q.

Readout on display:

```
Basic setting         10    EIN <8-OFF>
Rel. pedal;FR+FL bleeder screws OPEN <8>
```

– Press 8.

Readout on display:

```
Basic setting       10           <8-OFF>
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
Basic setting       10           <8-OFF>
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
Basic setting       10           <8-OFF>
Bleeder screw CLOSED         <8>
```

– Press 8.

Readout on display:

```
Basic setting       10           <8-OFF>
Rel. pedal;RR+RL bleeder screws OPEN <8>
```

– Press 8.

Readout on display:

```
Basic setting         10         <8-OFF>
Actuate pedal 10x; wait
```

♦ Return flow pump for ABS -V39- runs.

Readout on display:

```
Basic setting          10        <8-OFF>
Bleeder screw CLOSED       <8>
```

– Press 8.

Readout on display:

```
Basic setting         10         <8-OFF>
Part bleeding ended...
```

– Press →.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 0 and 6 for the function „End output“ and confirm the entry with Q.

Readout on display:

►
```
Vehicle system test                    HELP
Enter address word XX
```

– Switch off ignition.

– Separate plug connection to V.A.G. 1552.

– Bleed brake system ⇒ Chapter 47-4.

– Perform test drive with at least one ABS adjustment.

Null balance of the steering angle sender -G85- (vehicles with ABS/TCS/ESP BOSCH 8.0)

Null balance of the steering angle sender -G85- is required if:

- the ABS control unit -J104- or the steering angel sender -G85- is replaced and the control unit is coded subsequently.
- the steering column is replaced.
- Settings have been changed on the running gear within the scope of a chassis alignment.
- if as a result of a fault entry in the fault memory of the ABS control unit -J104- the fault table indicates a fault, perform null balance.

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-

Perform basic setting of vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

Perform basic sitting of the vehicle system tester -V.A.G 1552-

Note

For the null balance of the steering angle sender -G85- first perform function 16 „access authorisation“. To do so first enter the workshop code in the vehicle system tester -V.A.G 1552-.

– Start the engine.

– Turn the steering column one turn to the right and one turn to the left.

– Perform a short test drive on an even surface. Drive straight ahead and no faster than 20 km/h, pay specific attention to the following two points:

- If the steering wheel is off straight, correct within the scope of a chassis alignment. After the alignment again perform null balance.
- If during the test drive the steering wheel is straight, stop the vehicle in its straight ahead position.

Make sure the steering wheel is not moved. Do not switch off the ignition!

– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 1 and 6 for the function „access authorisation“ and confirm with Q.

Readout on display:

```
Access authorisation
Enter code number  XXXXX
```

– Enter code number 40168 and confirm entry with Q.

Readout on display:

```
Vehicle system test                    HELP
Select function XX
```

– Press 0 and 4 for the function „basic setting“ and confirm with Q.

Readout on display:

```
Basic setting
Enter display group number XXX
```

– Press 0, 0 and 1 and confirm with Q.

If this appears on the display, function 16 „access authorisation“ was not successfully performed.

```
Function unknown or cannot        -  ->
be carried out at the moment
```

Readout on display:

```
Basic setting     1   ON <8-OFF>    ->
Bal. steer. angl. send. O.K.
```

Null balance steering angle sender -G85- is performed successfully.

– Check straight-ahead position using function 8 „read measured value block“ ⇒ Chap. 45-11, display group number 005.

or:

Readout on display:

```
Basic setting    1   ON <8-OFF>     ->
Bal. steer. angl. send. N.O.K.
```

Null balance steering angle sender -G85- is not performed successfully.

– Switch off ignition then switch on again after 10 seconds.
– Repeat the null balance of the steering angle sender -G85-.

or:

Readout on display:

```
Basic setting     1   ON <8-OFF>     -
Bal. steer. angl. send. locked
```

Null balance of the steering angle sender -G85- was not performed, because the steering wheel with the steering angle sender -G85- was not yet moved (steered).

– Switch off ignition then switch on again after 10 seconds.
– Repeat the null balance of the steering angle sender -G85-.
– Press →.

Readout on display:

```
Vehicle system test                    HELP
Enter address word XX
```

– Press 0 and 6 for the function „End output“ and confirm with Q.

Perform ESP road and system test (vehicles with ABS/TCS/ESP BOSCH 8.0)

The ESP road test is a plausibility test of the signals from the lateral acceleration sender -G200-, yaw rate sender -G202- (both senders in the ESP sensor unit -G419-) and the brake pressure sender 1 -G201- (in the hydraulic control unit).

The ESP road test should be performed after each replacement of the electrical components of the ESP system.

If the ESP road test is initiated, it can no longer be interrupted and must be performed.

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B, 3C-, -VAS 5051/5A- or -VAS 5051/6A-

Perform basic setting of vehicle diagnosis, measurement and information system -VAS 5051-.

⇒ Chapter 45-4

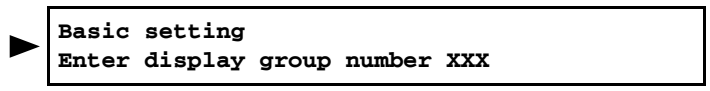
Perform basic setting of vehicle system tester -V.A.G 1552-

– Connect Vehicle system tester -V.A.G 1552- and select the control unit for brake electronics with the ignition switched on (address word 03) ⇒ Chap. 45-5.

Readout on display:

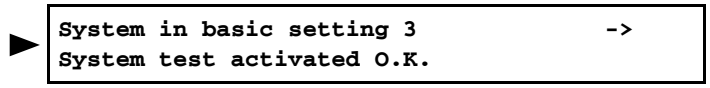
– Press 0 and 4 for the function „basic setting“ and confirm with Q.

Readout on display:



– Press 0, 0 and 3 and confirm with Q.

Readout on display:



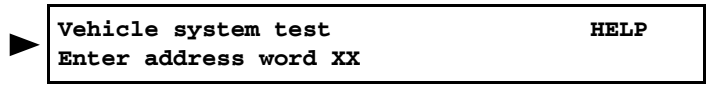
The ESP road and system test is activated, ESP and TCS warning light -K155- lights up.

– Press →.

Readout on display:

– Press 0 6 for the function „End output“ and confirm with Q.

Readout on display:



– Disconnect vehicle system tester -V.A.G 1552-.

– Start the engine.

– Depress the brake pedal forcefully until the ESP and TCS warning light -K155- goes out, at the same time the ABS warning light -K47- lights up.

– Now perform the ESP road test.

WARNING!

- ***Observing the rules of the road traffic regulations as well as paying attention to the traffic conditions must be given top priority.***

– Drive a right or a left curve. Subsequently carry out a change of direction and drive a left or a right curve.

– After cornering, drive straight ahead for a certain period of time.

Note

- *A curve with a radius of 10 to 12 meters and a speed of 15 to 20 km/h must be driven in approx 4 seconds during cornering.*
- *It must be driven in such a way, that no ABS, EDL, TCS or ESP control is activated.*
- *If there are other traffic dependent driving manoeuvres between cornerings, they will have no influence on the ESP road test.*

If the ABS warning light -K47- goes out, the ESP road and system test was successfully performed and ended, the system is OK.

If the ABS warning light -K47- does not go out, the ESP road and system test was not successfully performed.

– Repeat the ESP road and system test ⇒ 45-14 page 5.

If the ABS warning light -K47- and the ESP and TCS warning light -K155- light up, there are faults in the system.

– Interrogate fault memory ⇒ Chap. 45-5.

45-15 Electrical Test - ABS systems BOSCH 5.7

Special tools, test and measuring equipment and auxiliary items required

- Test box -V.A.G 1598A-
- Adapter -V.A.G 1598/34-
- Adapter -V.A.G 1598/34R-
- Measuring tool set, e.g. -V.A.G 1594 A-
- Hand multimeter, e.g. -V.A.G 1526 A-

The test steps ⇒ 45-15 page 4 **apply for:**

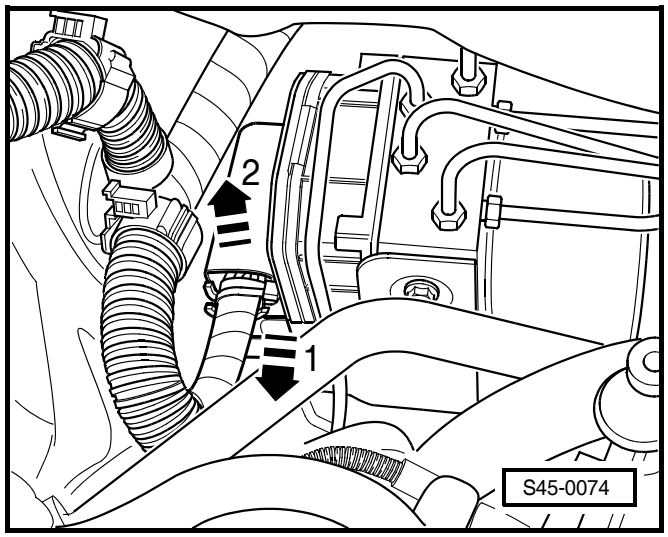
- Vehicles for which the final control diagnosis does not indicate the fault source. In this case the full electric inspection must be carried out.
- Vehicles for which the final control diagnosis does give a direct indication of the fault source. Then only perform the test steps recommended in the test table (targeted approach).

Test requirements

- Fuses according to current flow diagram O.K. ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
- Before starting the test switch off the ignition and electrical consumers (headlights, lighting, blowers etc.).

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

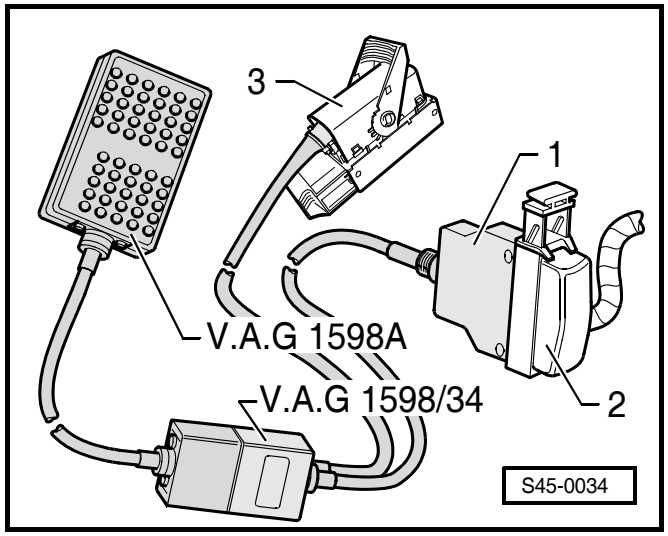
– Unlatch the multi-pin connector -arrow 1- and disconnect from the ABS with EDL control unit -J104- by pulling upwards -arrow 2-. ►



– Connect the test box -V.A.G 1598A- with adapter -V.A.G 1598/34- -1- to the multi-pin connector on the wiring loom -2-. ►

Use adapter -V.A.G 1598/34R- for RH drive vehicles.

Do not connect the multi-pin connector of the adapter -V.A.G 1598/34- -3-.



The nominal values are specific to V.A.G 1526A and do not necessarily apply for other measuring tools.

After the electrical test:

– Insert the multi-plug connector on the ABS with EDL control unit -J104- and lock.

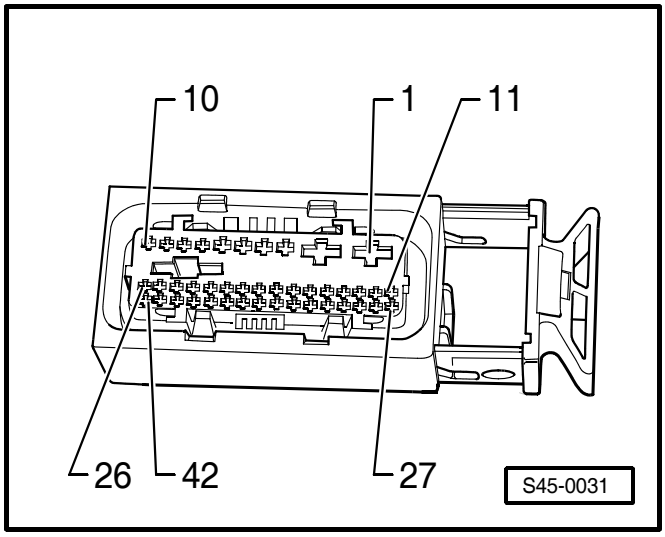
– Performing automatic test sequence ⇒ Chapter 45-5.

Multi-pin connector with contact assignment

Note

All unlisted contacts are not yet assigned and must under no circumstances be connected to other components!

Contact assignment of 42-pin plug connection -T42- wiring loom/ABS control unit -J104- ►



Contact	Wiring to component …
1	Earth terminal 31
2	Voltage supply of battery + (terminal 30)
5	Earth terminal 31
6	Voltage supply of battery + (terminal 30)
8[1)]	Lateral acceleration sender -G200- (signal line)
9[1)]	Lateral acceleration sender -G200- and yaw rate sender -G202-
10[1)]	Lateral acceleration sender -G200- and yaw rate sender -G202-
12	Speed sensor front left -G47-
13	Speed sensor rear left -G46-
14	Speed sensor rear left -G46-
15	Speed sensor front right -G45-
16	Speed sensor front right -G45-
19[2)]	Rear right speed sensor output
21[1)]	Lateral acceleration sender -G200- and yaw rate sender -G202- (earth cable)
23	Voltage supply (terminal 15)
24	Data BUS cable (CAN-R) ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations
25[1)]	Brake pressure sender 1 -G201- (earth cable)
26[1)]	Brake pressure sender 1 -G201- (signal line)
27	Traction control system switch -E132- or TCS and ESP button -E256-
28	Speed sensor front left -G47-
30	Speed sensor rear right -G44-
31	Speed sensor rear right -G44-
32	Brake light switch -F-
34[2)]	Rear left speed sensor output
37[1)]	Brake pedal switch -F47-
38[1)]	Handbrake warning switch -F9-
39[1)]	Voltage supply for: ♦ Steering angle sender -G85- ♦ Lateral acceleration sender -G200- ♦ Yaw rate sender -G202-

Contact	Wiring to component …
40	Data BUS cable (CAN-L) ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations
41[1)]	Yaw rate sender -G202- (signal line)
42[1)]	Brake pressure sender 1 -G201- (voltage line)

1) only assigned on vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

2) only assigned on vehicles with ABS/EDL/TCS/ESP BOSCH 5.7 and navigation system

Overview of test steps

Component to be tested	Test steps in test table ⇒ 45-15 page 4
Voltage supply for the ABS return flow pump -V39- to the ABS control unit -J104-	– Perform test step 1
Voltage supply of the valves in the hydraulic unit for ABS -N55- to the ABS control unit -J104-	– Perform test step 2
Voltage supply (terminal 15) to the ABS control unit -J104-	– Perform test step 3
Function of the brake light switch -F-	– Perform test step 4
Function of the traction control system switch -E132- or TCS and ESP button -E256-	– Perform test step 5
Test of the data BUS cables	– Perform test step 6
Handbrake warning switch -F9- [1)]	– Perform test step 7

1) Test can only be performed on vehicles with ABS/EDL/TCS/ESP BOSCH 5.7.

Test table

Note

- *The denominations of the bushes of the test box -V.A.G 1598A- with the adapter -V.A.G 1598/34- are identical to the contact denominations of the ABS with EDL control unit -J104- in the current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.*
- *If the measured values deviate from the nominal values perform the fault eliminating measures listed in the right part of the table.*
- *Once these values are reached, additionally check the cable for short-circuit to positive and earth.*
- *If the measured values only differ slightly from the nominal values, clean the bushes and plugs of the test devices and measuring cables (with contact spray -G 000 700 04-) and repeat the test. Before replacing the relevant components test the cables and connectors; more specifically for nominal values below 10 Ω repeat the resistance measurement on the component.*

Switch on measuring range: Voltage measurement (20V=)					
Test step	**Test box -V.A.G 1598A- with adapter -V.A.G 1598/34-**	**Test covers**	• **Test conditions** ♦ **additional works**	**Specification**	**Measures for deviations from nominal value**
1	1 + 2 5 + 2	Voltage supply for the ABS return flow pump -V39- to the ABS control unit -J104-	• Ignition off	approx. battery voltage	– Test cable from contact 1 or 5 to earth. – Test cable from contact 2 via fuse to battery + ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
2	1 + 6 5 + 6	Voltage supply for the valves in the ABS return flow pump -V39- to the ABS control unit -J104-	• Ignition off	approx. battery voltage	– Test cable from contact 1 or 5 to earth. – Test cable from contact 6 via fuse to battery + ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
3	23 + 1 23 + 5	Voltage supply (terminal 15) to the ABS control unit -J104-	• Ignition on	approx. battery voltage	– Test cable from contact 1 or 5 to earth. – Test cable from contact 23 to the connector of terminal 15 ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.

Switch on measuring range: Voltage measurement (20V=)					
Test step	**Test box -V.A.G 1598A- with adapter -V.A.G 1598/34-**	**Test covers**	• **Test conditions** ♦ **additional works**	**Specification**	**Measures for deviations from nominal value**
4	5 + 32	Function of the brake light switch -F-	• Ignition off • Brake pedal not actuated	< 1.0 V	– Test brake light switch -F- and read measured value block ⇒ Chap. 45-10, display group number 003. – Test cable from contact 5 to earth. – Test cable from contact 32 to the brake light switch -F- ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
			– Actuate brake pedal	approx. battery voltage	– Test brake light switch -F- ⇒ Chap. 45-16. – Test fuse.
5	5 + 27	Function of the traction control system switch -E132- or TCS and ESP button -E256-	• Ignition on • Traction control system switch or TCS and ESP button pressed.	approx. battery voltage	– Test cable from contact 5 to earth. – Test cable fom contact 27 to traction control system switch -E132- or TCS and ESP button -E256-. – Check traction control system switch -E132- or TCS and ESP button -E256-
			• Traction control system switch or TCS and ESP button not pressed.	< 1.0 V	

Switch on measuring range: Resistance measurement (200 Ω/20 MΩ)					
Test step	**Test box -V.A.G 1598A- with adapter -V.A.G 1598/34-**	**Test covers**	• **Test conditions** ♦ **additional works**	**Specification**	**Measures for deviations from nominal value**
6	24 + 40	Data BUS cables	• Ignition off • Measuring range 200 Ω set – Disconnect control units on the data BUS drive ⇒ Electrical System; Rep. Gr. 90 – Connect Test box -V.A.G 1598A- with adapter -V.A.G 1598/34- – Check the data BUS cable for open circuit.	max. 1.5 Ω	– Check data BUS ⇒ Chapter 48-27. – Check wiring according to current flow diagram ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
			• Ignition off • Measuring range 20 MΩ set – Check cables for short-circuit between the cables or for short-circuit to positive term. or earth.	∞Ω	

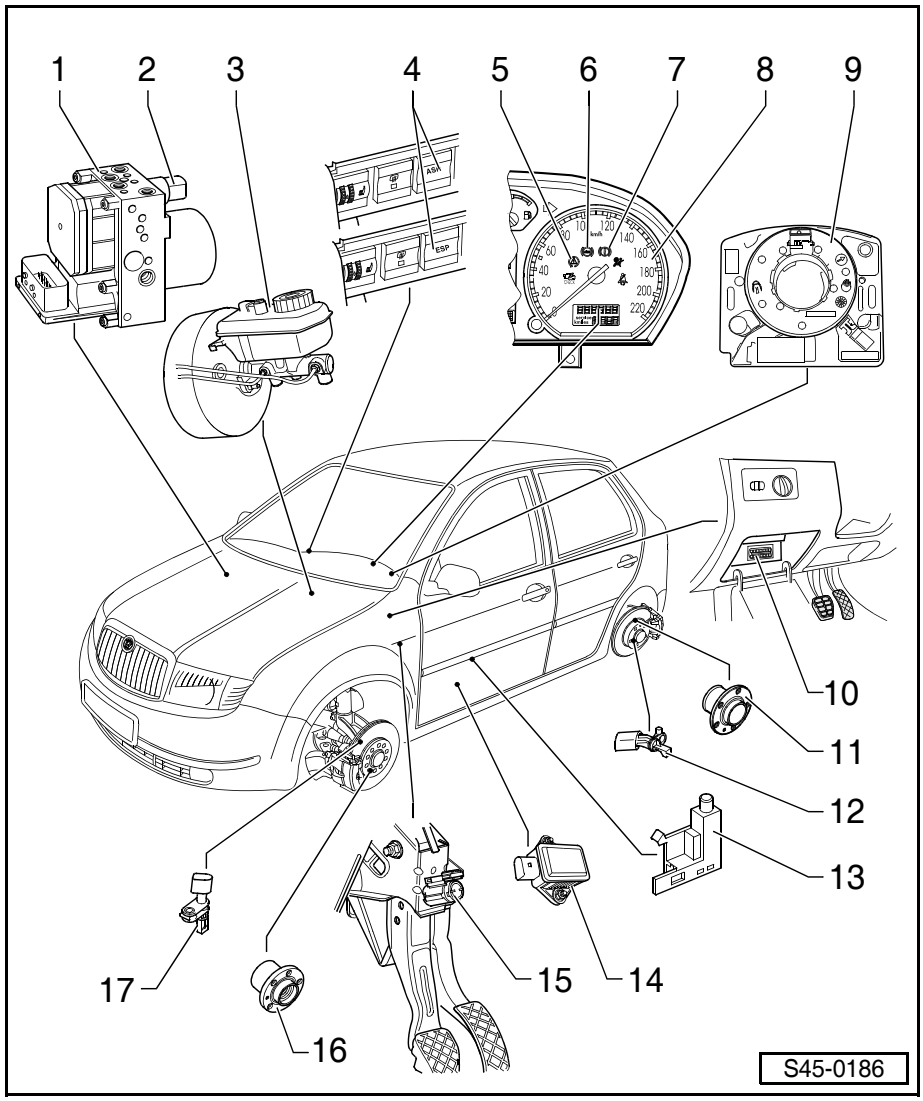
Switch on measuring range: Voltage measurement (20V=)					
Test step	**Test box -V.A.G 1598A- with adapter -V.A.G 1598/34-**	**Test covers**	• **Test conditions** ♦ **additional works**	**Specification**	**Measures for deviations from nominal value**
7[1)]	38 + 2	Switch for handbrake control -F9-	• Ignition off • Handbrake not applied	< 1.0 V	– Reading measured value block ⇒ Chap. 45-10, display group number 002. – Test cable from contact 2 via fuse to battery +. – Test cable from contact 38 to the handbrake warning switch -F9- ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.
			– Apply handbrake.	approx. battery voltage	

1) This test sequence can only be performed on vehicles with ABS/EDL/TCS/ESP BOSCH 5.7.

45-16 Electrical/electronic components and fitting locations - ABS/ ESP systems BOSCH 5.7 and BOSCH 8.0

Summary of components - Electrical/electronic components and fitting locations - ABS/ESP systems BOSCH 5.7

All components marked with 1) can be tested using the vehicle system tester -V.A.G 1552- or the fault read-out scan tool -V.A.G 1551- with the self-diagnosis or using the vehicle diagnosis, measurement and information system -VAS 5051-.



1 - Hydraulic control unit BOSCH 5.7 1)

- ❑ fitted until CW 21/2004
- ❑ different versions:
  - ♦ for ABS and ABS/EDL/TCS BOSCH 5.7 without brake pressure sender 1 -G201-
  - ♦ for ABS/EDL/TCS/ESP BOSCH 5.7 with brake pressure sender 1 -G201-
  - ♦ Distinguishing features ⇒ Chapter 45-2
- ❑ Fitting location: in right of engine compartment
- ❑ removing and installing ⇒ Chapter 45-17
- ❑ disassembling and assembling ⇒ Chapter 45-17

ABS/EDL/TCS/ESP BOSCH 5.7 must not be disassembled and repaired

2 - Brake pressure sender 1 -G201- 1)

- ❑ only on vehicles with ABS/ EDL/TCS/ESP BOSCH 5.7
- ❑ Fitting location: screwed into the hydraulic control unit
- ❑ removing and installing ⇒ Chapter 45-17
- ❑ must only be replaced, but not repaired

3 - Brake servo unit with master brake cylinder and brake fluid reservoir

4 - Traction control system switch -E132 - or TCS and ESP button -E256-

- ❑ Fitting location: Centre part of dash panel above radio
- ❑ Operation: Switching off the TCS or ESP function
- ❑ can be inspected in the measured value block ⇒ Chapter 45-10 and during the Electrical Test ⇒ Chapter 45-15
- ❑ removing and installing ⇒ Electrical System; Rep. Gr. 96; Switches in the dash panel and in the doors, removing and installing switches in the centre console

5 - Traction control system warning light -K86- or ESP and TCS warning light -K155-

- ❑ Fitting location: in the dash panel insert

Operation:

- ❑ the warning light lights up:

- ♦ for about 2 seconds after ignition is switched on
- ♦ if fault is detected in TCS or ESP operation
- ♦ after switching the traction control system switch or TCS and ESP button to „OFF“

⇒ 45-16 page 6

❑ the warning light flashes:

- ♦ during TCS/ESP control

6 - ABS warning light -K47-

❑ Fitting location: in the dash panel insert

Operation:

❑ the ABS warning light lights up:

- ♦ for about 2 seconds after the ignition is switched on or the engine is started
- ♦ if a fault is detected, e.g. open circuit to wheel speed sensor

⇒ 45-16 page 6

7 - Dual circuit and hand brake system warning light -K7-

❑ Fitting location: in the dash panel insert

Operation:

❑ Dual circuit and hand brake system warning light:

- ♦ lights up if hand-brake is applied
- ♦ flashes if low brake fluid level
- ♦ lights up for about 2 seconds after ignition is switched on
- ♦ lights up if the electronic brake pressure distribution fails, i.e. when the ABS warning light -K47- comes on

⇒ 45-16 page 6

8 - Dash panel insert

❑ fitted up to model year 2004

9 - Steering angle sender -G85-[1)]

❑ only on vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

❑ Fitting location: on steering column between the steering wheel and the steering column switch

❑ can be tested in the measured value block ⇒ Chapter 45-10

❑ removing and installing ⇒ 45-16 page 10

10 - Diagnostic connection

❑ Fitting location: in the storage area on the driver's side

11 - Wheel hub with wheel bearing

❑ Sensor ring for ABS is built into the wheel hub

- ♦ removing and installing: can only be replaced together with wheel hub and wheel bearing ⇒ Chapter 42-5

12 - Rear right and rear left wheel speed sensors -G44/G46-[1)]

❑ removing and installing (disc brake or drum brake) ⇒ Chapter 45-19

❑ Rear wheel speed sensor cables

- ♦ removing and installing (disc brake or drum brake) ⇒ Chapter 45-19

13 - Switch for hand-brake control -F9-

❑ Fitting location: on handbrake lever

❑ can be inspected in the measured value block ⇒ Chapter 45-10 and during the Electrical Test ⇒ Chapter 45-15.

❑ removing and installing ⇒ Chapter 46-3

14 - Lateral acceleration sender -G200- and yaw rate sender -G202-[1)]

❑ only on vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

❑ Fitting location: under left front seat

❑ both senders are integrated in one housing

❑ can be tested in the measured value block ⇒ Chapter 45-10

❑ removing and installing ⇒ 45-16 page 13

15 - Brake light switch -F-[1)]

❑ assignment ⇒ Spare part catalogue

❑ is open in the off position

- ♦ adjust ⇒ 45-16 page 8
- ♦ removing and installing ⇒ 45-16 page 8

- ♦ replace after each removal
- ❑ can be inspected in the measured value block ⇒ Chapter 45-10 and during the Electrical Test ⇒ Chapter 45-15

16 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub
- ♦ removing and installing: can only be replaced together with wheel hub and wheel bearing ⇒ Chapter 40-3

17 - Front right and front left wheel speed sensors -G45/G47-[1)]

- ❑ removing and installing ⇒ Chapter 45-19
- ❑ Front wheel speed sensor cables
- ♦ removing and installing ⇒ Chapter 45-19

Summary of components - Electrical/electronic components and fitting locations - ABS/ESP systems BOSCH 8.0

All components marked with [1)] can be tested using the vehicle system tester -V.A.G 1552- or the fault read-out scan tool -V.A.G 1551- with the self-diagnosis or using the vehicle diagnosis, measurement and information system -VAS 5051-.

1 - Hydraulic control unit BOSCH 8.0[1)]

- ❑ fitted as of CW 22/2004
- ❑ different versions:
- ♦ ABS
- ♦ ABS/TCS
- ♦ assignment ⇒ Spare part catalogue
- ♦ Distinguishing features ⇒ Chapter 45-2
- ❑ Fitting location: in right of engine compartment
- ❑ removing and installing ⇒ Chapter 45-18

2 - Traction control system switch -E132- or TCS and ESP button -E256-[1)]

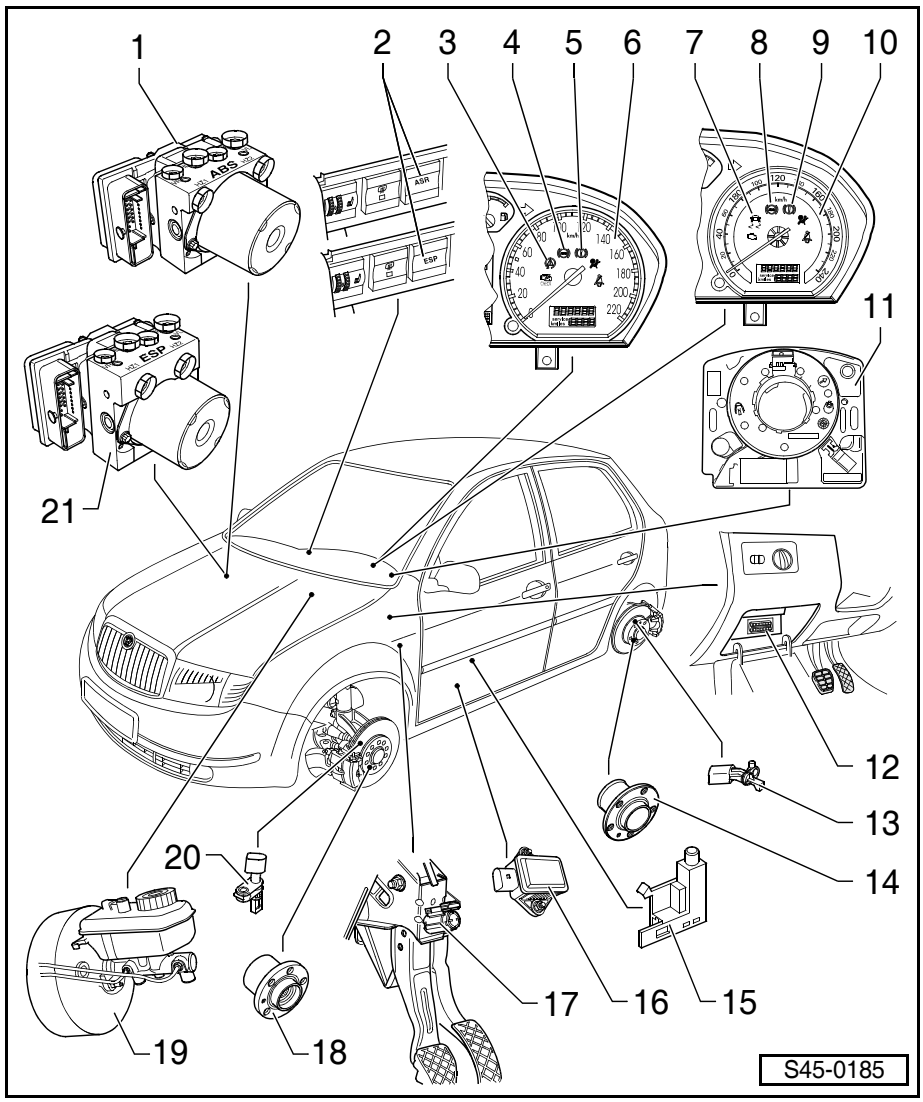
- ❑ Fitting location: Centre part of dash panel above radio
- ❑ Operation: Switching off the TCS or ESP function
- ❑ removing and installing ⇒ Electrical System; Rep. Gr. 96; Switches in the dash panel and in the doors, removing and installing switches in the centre console

3 - Traction control system warning light -K86- or ESP and TCS warning light -K155-

- ❑ Fitting location: in the dash panel insert ⇒ item 6

Operation:

- ❑ the warning light lights up:
- ♦ for about 2 seconds after ignition is switched on
- ♦ if fault is detected in TCS or ESP operation
- ♦ after switching the traction control system switch or TCS and ESP button to „OFF“



⇒ 45-16 page 6
- ❑ the warning light flashes:
- ♦ during TCS/ESP control

4 - ABS warning light -K47-
- ❑ Fitting location: in the dash panel insert ⇒ item 6

Operation:
- ❑ the ABS warning light lights up:
- ♦ for about 2 seconds after the ignition is switched on or the engine is started
- ♦ if a fault is detected, e.g. open circuit to wheel speed sensor

⇒ 45-16 page 6

5 - Dual circuit and hand brake system warning light -K7-
- ❑ Fitting location: in the dash panel insert ⇒ item 6

Operation:
- ❑ Dual circuit and hand brake system warning light:
- ♦ lights up if hand-brake is applied
- ♦ flashes if low brake fluid level
- ♦ lights up for about 2 seconds after ignition is switched on
- ♦ lights up if the electronic brake pressure distribution fails, i.e. when the ABS warning light -K47- comes on

⇒ 45-16 page 6

6 - Dash panel insert
- ❑ fitted up to model year 2004

7 - Traction control system warning light -K86- or ESP and TCS warning light -K155-
- ❑ Fitting location: in the dash panel insert ⇒ item 10

Operation:
- ❑ the warning light lights up:
- ♦ for about 2 seconds after ignition is switched on
- ♦ if fault is detected in TCS or ESP operation
- ♦ after switching the traction control system switch or TCS and ESP button to „OFF“

⇒ 45-16 page 6
- ❑ the warning light flashes:
- ♦ during TCS/ESP control

8 - ABS warning light -K47-
- ❑ Fitting location: in the dash panel insert ⇒ item 10

Operation:
- ❑ the ABS warning light lights up:
- ♦ for about 2 seconds after the ignition is switched on or the engine is started
- ♦ if a fault is detected, e.g. open circuit to wheel speed sensor

⇒ 45-16 page 6

9 - Dual circuit and hand brake system warning light -K7-
- ❑ Fitting location: in the dash panel insert ⇒ item 10

Operation:
- ❑ Dual circuit and hand brake system warning light:
- ♦ lights up if hand-brake is applied
- ♦ flashes if low brake fluid level
- ♦ lights up for about 2 seconds after ignition is switched on
- ♦ lights up if the electronic brake pressure distribution fails, i.e. when the ABS warning light -K47- comes on

⇒ 45-16 page 6

10 - Dash panel insert
- ❑ fitted as of model year 2005

11 - Steering angle sender -G85-[1)]
- ❑ only on vehicles with ABS/TCS/ESP BOSCH 8.0
- ❑ Fitting location: on steering column between the steering wheel and the steering column switch
- ❑ removing and installing ⇒ 45-16 page 10

12 - Diagnostic connection

- ❑ Fitting location: in the storage area on the driver's side

13 - Rear right and rear left wheel speed sensors -G44/G46-[1)]

- ❑ removing and installing (disc brake or drum brake) ⇒ Chapter 45-19
- ❑ Rear wheel speed sensor cables
  - ♦ removing and installing (disc brake or drum brake) ⇒ Chapter 45-19

14 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub
  - ♦ removing and installing: can only be replaced together with wheel hub and wheel bearing ⇒ Chapter 42-5

15 - Handbrake warning switch -F9-[1)]

- ❑ Fitting location: on handbrake lever
- ❑ removing and installing ⇒ Chapter 46-3

16 - ESP sensor unit -G419-[1)]

- ❑ only on vehicles with ABS/TCS/ESP BOSCH 8.0
- ❑ Fitting location: under left front seat
- ❑ removing and installing ⇒ 45-16 page 13
- ❑ Lateral acceleration sender -G200- and yaw rate sender -G202- are combined in a common housing with the ESP sensor unit -G419-
  - ♦ there are no separate fault codes

17 - Brake light switch -F-[1)]

- ❑ assignment ⇒ Spare part catalogue
- ❑ is open in the off position
  - ♦ adjust ⇒ 45-16 page 8
  - ♦ removing and installing ⇒ 45-16 page 8
  - ♦ replace after each removal

18 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub
  - ♦ removing and installing: can only be replaced together with wheel hub and wheel bearing ⇒ Chapter 40-3

19 - Brake servo unit with master brake cylinder and brake fluid reservoir

20 - Front right and front left wheel speed sensors -G45/G47-[1)]

- ❑ removing and installing ⇒ Chapter 45-19
- ❑ Front wheel speed sensor cables
  - ♦ removing and installing ⇒ Chapter 45-19

21 - Hydraulic control unit BOSCH 8.0[1)]

- ❑ fitted as of CW 22/2004
- ❑ ABS/TCS/ESP
- ❑ assignment ⇒ Spare part catalogue
- ❑ Distinguishing features ⇒ Chapter 45-2
- ❑ Fitting location: in right of engine compartment
- ❑ removing and installing ⇒ Chapter 45-18
- ❑ ABS/TCS/ESP BOSCH 8.0 must not be disassembled and repaired

Indication of faults by means of warning lights

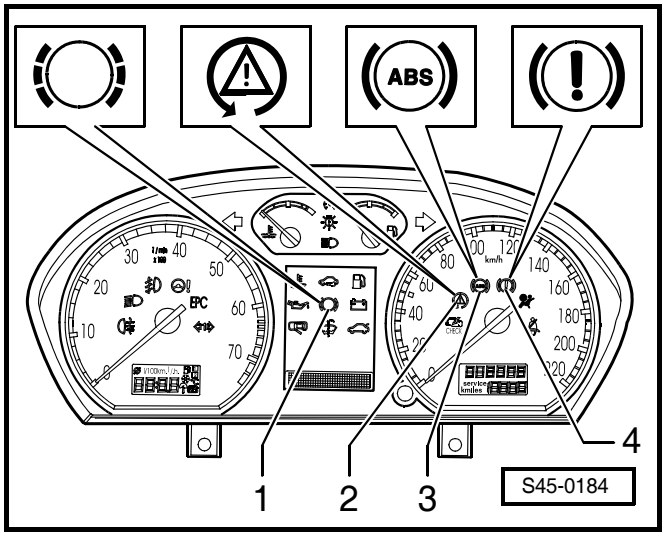
Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or fault read-out scan tool -V.A.G 1551- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B-, -V.A.G 1551/3C- or Diagnostic cable -VAS 5051/5A- or -VAS 5051/6A -

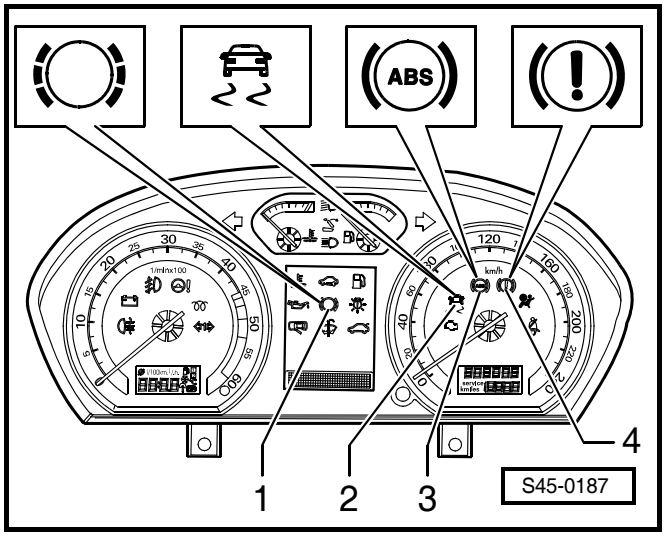
Note

- *When using the fault reader -V.A.G 1551- a minor deviation in the display is possible.*
- *When using the vehicle diagnosis, measurement and information system -VAS 5051- the electrical test is integrated in the „Targeted fault finding“.*

Dash panel insert up to model year 2004 ►



Dash panel insert as of model year 2005 ►



Warning lights

Pos.	Denomination
1	Brake pad warning light -K32-
2	Traction control system warning light -K86- ESP and TCS warning light -K155-
3	ABS warning light -K47-
4	Dual circuit and hand brake system warning light -K7-

Brake pad warning light -K32- (-1-)

- If the brake pad warning light -K32- (-1-) does not go out after switching the ignition on or glows during the driving operation, the following can be the causes of the fault:

a - The brake pads could be worn down.

Check the brake pads on the front and rear axles.

Replace the brake pads if they are worn down ⇒ Chapter 46-1 and ⇒ Chapter 46-2.

b - There is a fault in the wiring ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations

ABS warning light -K47- (-3-)

- If the ABS warning light -K47- (-3-) does not go out after the ignition is switched on and after completion of the test sequence, the causes of the fault may be:

a - Voltage supply is less than 11 volts.

b - An ABS fault is present. If an ABS fault is present, the anti-lock brake system remains switched off while the conventional brake system remains fully operational.

WARNING!

If an ABS fault -b- is present, the anti-lock brake system remains switched off while the conventional brake system remains fully operational.

c - A fault existed on a wheel speed sensor after the last vehicle start (sporadic fault). If there is a fault on a vehicle speed sensor, the ABS warning light -K47- goes out automatically after restarting the vehicle and after a speed above 20 km/h is reached.

d - The connection form the dash panel insert to the ABS control unit -J104- (databus) is interrupted ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.

e - The dash panel insert is defective.

ABS warning light -K47- (-3-) and dual circuit and hand brake system warning light -K7- (-4-)

- If the ABS warning light -K47- (-3-) goes out or the dual circuit and hand brake system warning light -K7- (-4-) lights up or flashes, the causes of the fault may be:

a - The hand-brake is still applied (warning light lights up).

b - The brake fluid level is too low (warning light flashes).

c - There is a fault in the wiring between dash panel insert and brake fluid level warning contact -F34- ⇒ Current Flow Diagrams, Electrical Fault Finding and Fitting Locations.

- If the ABS warning light -K47- (-3-) and the dual circuit and hand brake system warning light -K7- (-4-) do not go out, then the ABS and EBD (Electronic Brake pressure Distribution) have failed.

One must reckon with a somewhat changed braking characteristic.

WARNING!

Once the ABS warning light -K47- and the dual circuit and hand brake system warning light -K7- have lit up then one can expect the rear wheels to lock quite early on when braking.

ABS warning light -K47- (-3-), dual circuit and hand brake system warning light -K7- (-4-), traction control system warning light -K86- (-2-) and ESP and TCS warning light -K155- (-2-)

- If the ABS warning light -K47- (-3-) and the dual circuit and hand brake system warning light -K7- (-4-) goes out, but the traction control system warning light -K86- (-2-) or the ESP and TCS warning light -K155- (-2-) remain lit, the causes of the fault may be:

a - Fault relates only to TCS or ESP.

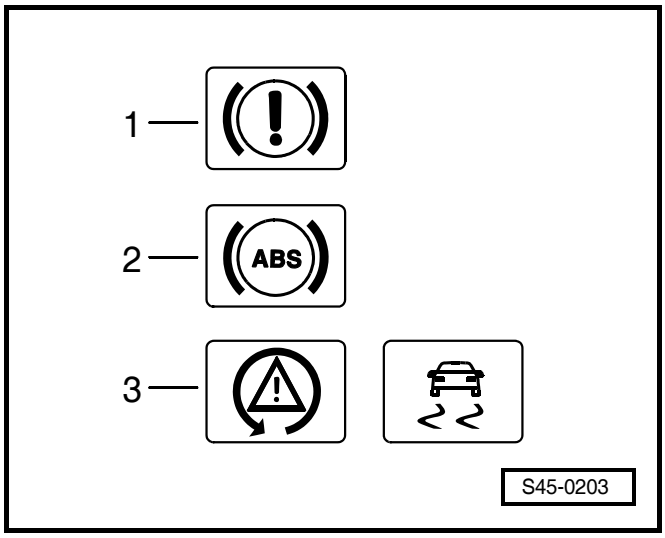
b - ASR is switched off with traction control system switch -E132- or ESP with TCS and ESP button -E256-.

c - TCS or ESP is in regulating mode (flashing rhythm 3x per second).

d - Short-circuit to positive in traction control system switch -E132- or in TCS and ESP switch -E256- (warning light goes out after approx. 5 minutes).

Display overview of the warning lights -K7-, -K47-, -K86- or -K 155-

Warning lights



1 - Dual circuit and hand brake system warning light -K7-

2 - ABS warning light -K47-

3 - Traction control system warning light -K86- or ESP and TCS warning light -K155-

For the warning lights of the pos. 3 there are two different symbols, ⇒ Dash panel insert as of model year 2004 and dash panel insert as of model year 2005.

Display overview

System condition	Dual circuit and hand brake system warning light -K7-	ABS warning light -K47-	Traction control system warning light -K86- or ESP and TCS warning light -K155-	Traction control system switch -E132- or TCS and ESP button -E256-
Ignition on test of the lights(-K7- is only indicated for the test in the dash panel insert)	lights up	lights up	lights up	not actuated
System o.k.	does not light up	does not light up	does not light up	not actuated
ESP/TCS or ABS/ TCS -in recess	does not light up	does not light up	flashes (3x/seconds)	not actuated
ESP/TCS or ABS/ TCS are switched off	does not light up	does not light up	lights up	activated
ESP/TCS or ABS/ TCS are switched on again via TCS and ESP button -E256- or traction control system switch -E132-(were switched off)	does not light up	does not light up	does not light up	activated

Setting, removing and installing the brake light switch -F-

Special tools, test and measuring equipment and auxiliary items required

♦ Polycarbamide grease -G 052 142 A2-

Note

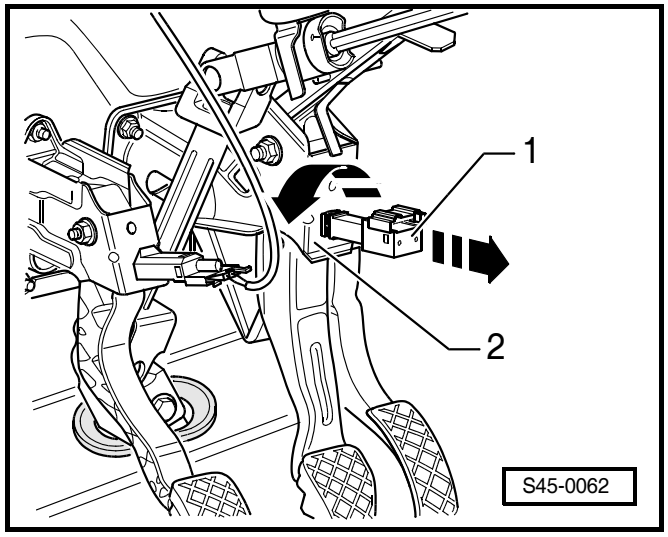
The brake light switch must be removed for setting.

– Remove the storage area on the driver's side ⇒ Body Work; Rep. Gr. 70.

– Unplug connector from brake light switch.

For vehicles up to 07.01

– Turn brake light switch -1- 90° to the left and remove from its bracket -2-.



Note

- *Carry out installation of the brake light switch only after attaching the ball head of the pushrod fron the brake servo unit to the brake pedal ⇒ Chapter 46-4.*
- *The contact surface which the tappet is to touch on the brake pedal should be greased using polycarbamide grease - G 052 142 A2- before installing the brake light switch.*

– To adjust, pull out the plunger of the brake light switch fully.

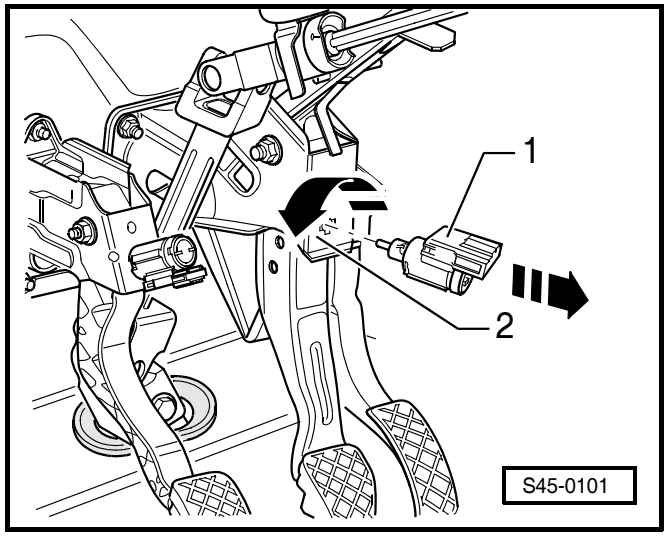
– Press down brake pedal as far as possible by hand.

– Guide the brake light switch through the assembly opening and install again by turning 90° to the right.

– Release brake pedal.

For vehicles from 08.01

– Turn brake light switch -1- 45° to the left and remove from its bracket -2-.



Note

- *The brake light switch may only be installed once to ensure that it has an adequately tight fit.*
- *Carry out installation of the brake light switch only after attaching the ball head of the pushrod fron the brake servo unit to the brake pedal ⇒ Chapter 46-4.*
- *The contact surface which the tappet is to touch on the brake pedal should be greased using polycarbamide grease -G 052 142 A2- before installing the brake light switch.*

– Guide the brake light switch through in the assembly opening and install by turning it 45° to the right.

Pull the brake light switch tappet out completely up to its stop before assembly since it will be automatically adjusted and set during assembly.

Brake pedal always remains in the off position in this case (not actuated).

– After installing the brake light switch, check whether brake pedal is in the end position (release position).

Continued for all vehicles

– Insert plug into brake light switch.

– Inspecting operation of the brake light switch BOSCH 5.7 ⇒ Chap. 45-10 BOSCH 8.0 ⇒ Chap. 45-11.

  Actuate brake pedal ⇒ all brake lights must light up.

  Release brake pedal ⇒ all brake lights must go out.

– Install the storage area on the driver's side ⇒ Body Work; Rep. Gr. 70.

Removing and installing steering angle sender -G85- - vehicles with ABS/EDL/ TCS/ESP BOSCH 5.7 or ABS/TCS/ESP BOSCH 8.0

The description of the structure and function of the steering angle sender -G85- can be found in self-study programme No. 42.

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B-, -V.A.G 1551/3C-, -VAS 5051/5A- or -VAS 5051/6A-

Removing

> ⚠ **WARNING!**
>
> ***Disconnect earth strap from the battery before commencing work on the electrical system.***
>
> ***If the battery earth strap is disconnected and connected, carry out additional operations ⇒ Electrical System; Rep. Gr. 27.***

– Disconnect battery ⇒ Electrical System; Rep. Gr. 27.

– Check whether the front wheels are in the straight-ahead position.

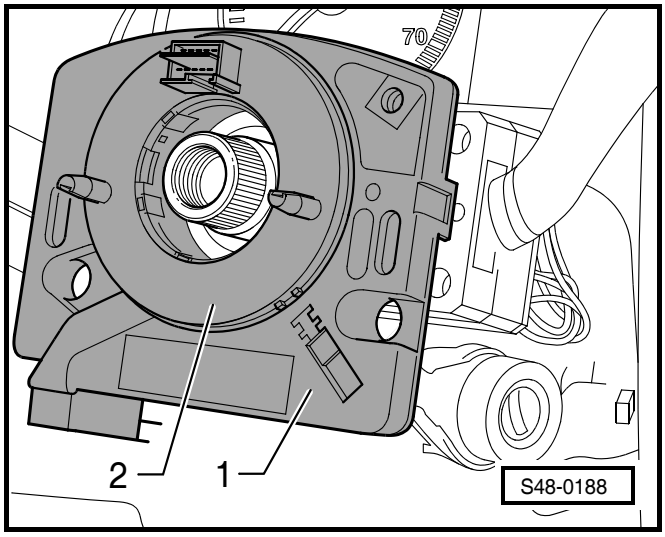
– Remove steering wheel ⇒ Body Work; Rep. Gr. 69.

– Removing steering column trim ⇒ Body Work; Rep. Gr. 70.

The steering angle sender -G85- is fitted together with the coil spring -2- in housing -1-. ►

They must not be separated or disassembled.

When removing pay attention to the steering angle sender -G85- to obtain correct re-installation:

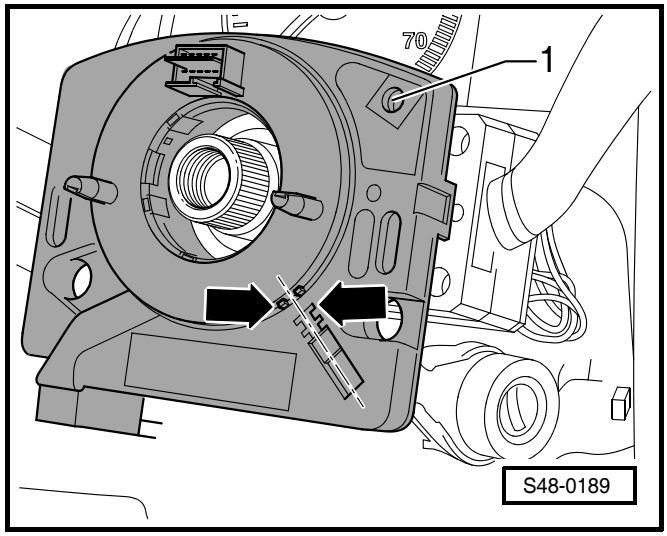


- Position the steering angle sender -G85- in the middle position as shown:

  A yellow dot must be visible in the window -1-.

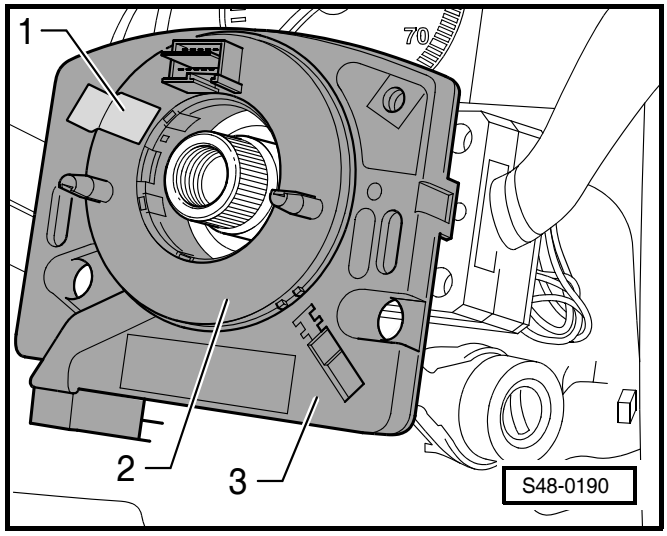
  The markings -arrows- must be flush.

Make sure this correct position is maintained.

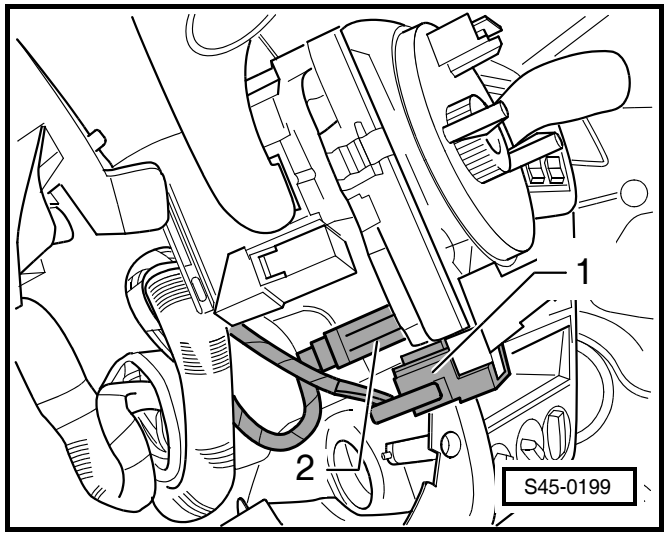


- Secure the coil spring -2- against unintentional turning by covering it with adhesive tape -1-.

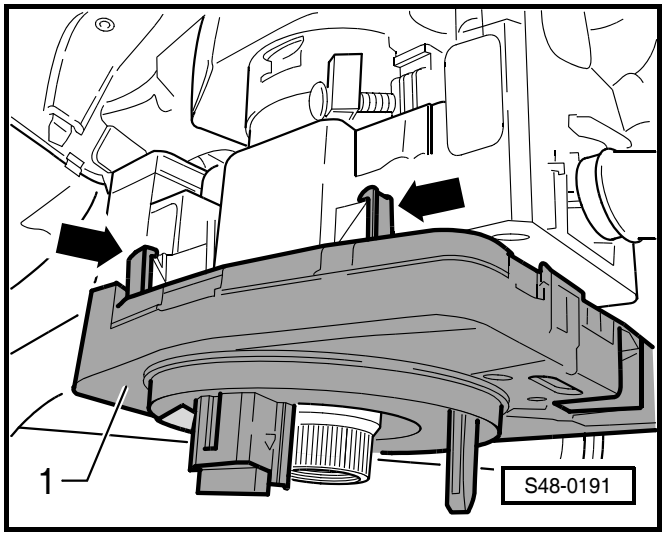
  -3- Housing for steering angle sender -G85-



– Disconnect plugs -1- and -2-.



– Carefully release catch hooks -arrows-, remove housing -1- with steering angle sender -G85- and coil spring.



Installing

– Slide housing -1- with steering angle sender -G85- and coil spring onto the steering column and lock into position with steering column switch -arrows-.

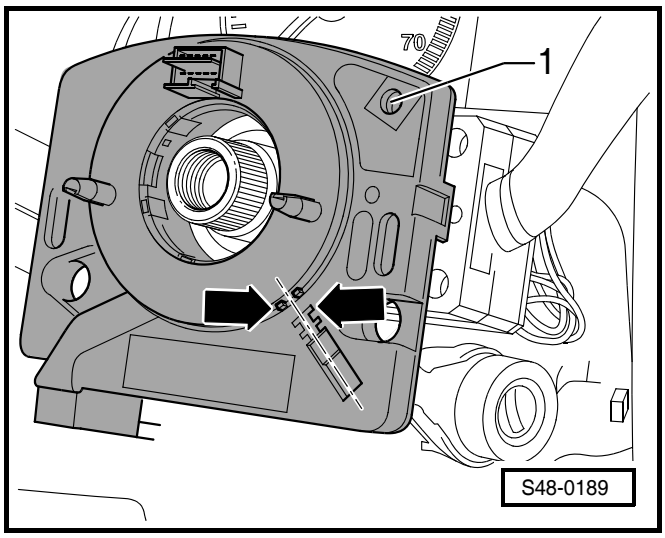
– Connect both plug connections.

Note

After removing the transport protection or the adhesive tape do not turn the coil spring, only the positioning of the steering angle sender -G85- in centre position is allowed.

– Removing transport protection or adhesive tape.

– Position the steering angle sender in the centre position:



A yellow dot must be visible in the window -1-.

The markings -arrows- must be flush.

Make sure this correct position is maintained.

– Fitting steering column trim ⇒ Body Work; Rep. Gr. 70.

– Install steering wheel ⇒ Body Work; Rep. Gr. 69.

– Connect battery ⇒ Electrical System; Rep. Gr. 27.

– Perform null balance of the steering angle sender -G85-.

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

♦ using the vehicle diagnosis, measurement and information system -VAS 5051- ⇒ Chapter 45-4.

or

♦ using the vehicle system tester -V.A.G 1552- ⇒ Chapter 45-13.

– Performing automatic test sequence ⇒ Chapter 45-5.

If a fault is stored in the fault memory:

– Eliminating fault ⇒ Chapter 45-6.

– Erasing fault memory ⇒ Chapter 45-5.

Vehicles with ABS//TCS/ESP BOSCH 8.0

♦ using the vehicle diagnosis, measurement and information system -VAS 5051- ⇒ Chapter 45-4.

or

♦ using the vehicle system tester -V.A.G 1552- ⇒ Chapter 45-14.

– Performing automatic test sequence ⇒ Chapter 45-5.

If a fault is stored in the fault memory:

– Eliminating fault ⇒ Chapter 45-7.

– Erasing fault memory ⇒ Chapter 45-5.

Removing and installing lateral acceleration sender -G200- and yaw rate sender -G202- or ESP sensor unit -G419- - vehicles with ABS/EDL/TCS/ESP BOSCH 5.7 or ABS/TCS/ESP BOSCH 8.0

Note

- *The lateral acceleration sender -G200- and the yaw rate sender -G202- are combined in one housing for the ABS/EDS/ASR/ESP BOSCH 5.7.*
- *Only the ESP sensor unit -G419- for the ABS/ASR/ESP BOSCH 8.0 exists. The lateral acceleration sender -G200- and the yaw rate sender -G202- are integrated in it.*
- *The removed unit is sensitive to strong vibrations.*
- *If the unit was exposed to strong vibrations or blows, its function cannot be guaranteed.*

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B-, -V.A.G 1551/3C-, -VAS 5051/5A- or -VAS 5051/6A-

Removing

WARNING!

- ***Disconnect earth strap from the battery before commencing work on the electrical system.***
- ***If the battery earth strap is disconnected and connected, carry out additional operations ⇒ Electrical System; Rep. Gr. 27.***

– Disconnect battery ⇒ Electrical System; Rep. Gr. 27.

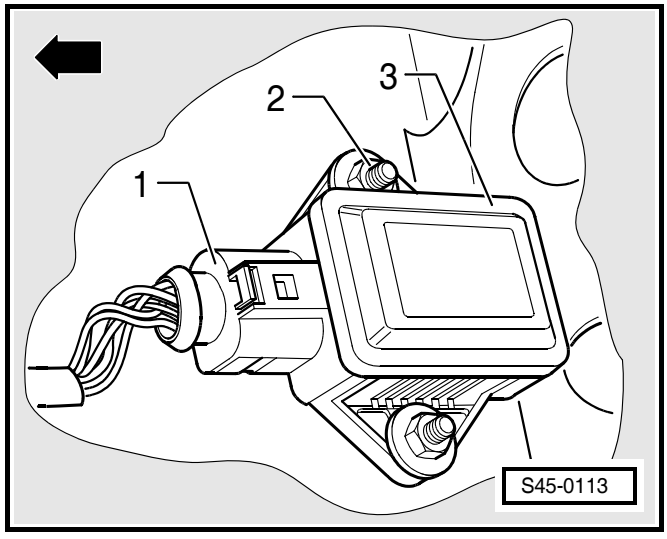
– Remove the driver's seat ⇒ Body Work; Rep. Gr. 72.

Note

- *The unit is located under the base of the left front seat before the cross member.*
- *-Arrow- in Fig. S45-0113 points in the travel direction.*

– Unplug plug -1- from the unit -3-.

– Unscrew hexagon nuts -2- and remove unit -3-.



Installing

Installation is performed in the reverse order. Pay attention to the following points:

– Connect battery ⇒ Electrical System; Rep. Gr. 27.

– Perform automatic test sequence ⇒ Chapter 45-5 either using the vehicle system tester -V.A.G 1552- or the vehicle system test ⇒ Chapter 45-4 using the vehicle diagnosis, measurement and information system -VAS 5051-.

If a fault is stored in the fault memory:

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

– Eliminating fault ⇒ Chapter 45-6.
– Erasing fault memory ⇒ Chapter 45-5.

Vehicles with ABS//TCS/ESP BOSCH 8.0

– Eliminating fault ⇒ Chapter 45-7.
– Erasing fault memory ⇒ Chapter 45-5.

Tightening torques:

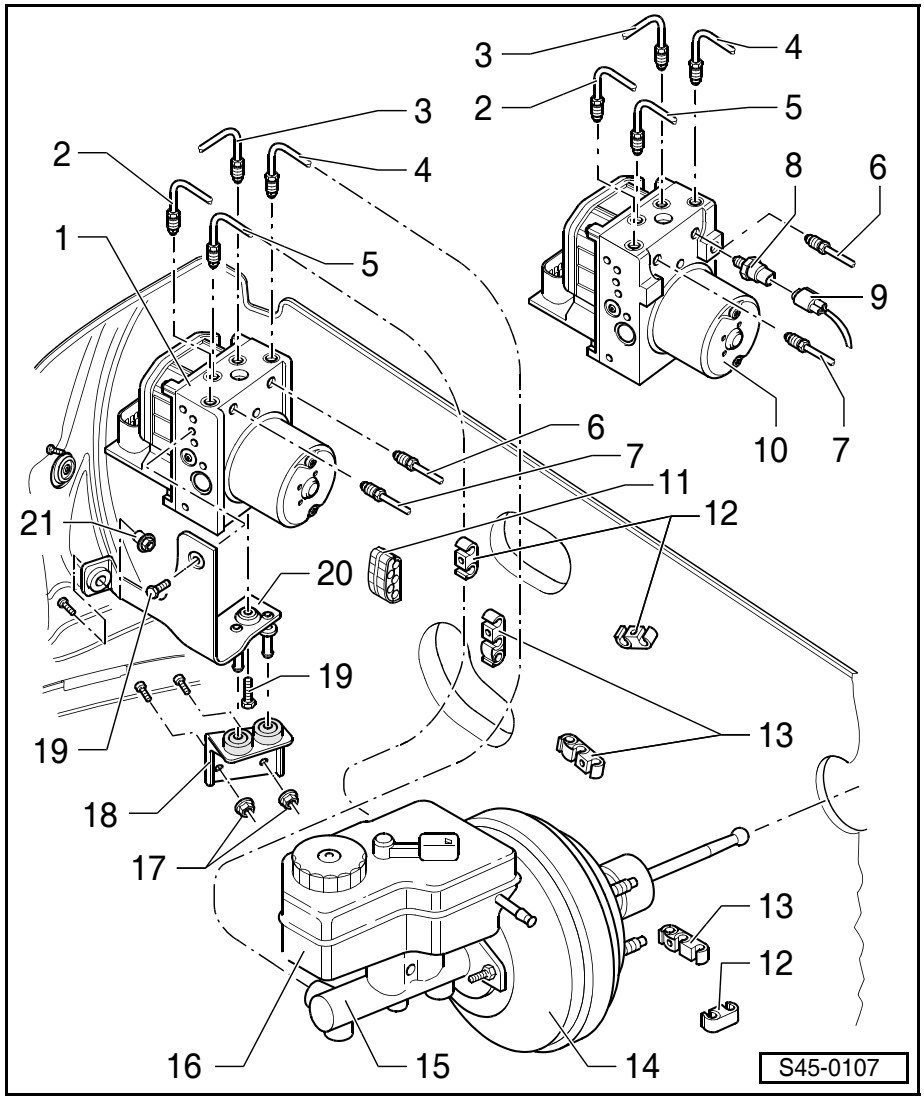
Sender -G200/G202 - on body (ABS/EDL/ TCS/ESP BOSCH 5.7)	6 Nm
ESP sensor unit -G419- on body (ABS/TCS/ ESP BOSCH 8.0)	6 Nm

45-17 Hydraulic control unit (ABS systems BOSCH 5.7), Brake servo unit/Master brake cylinder

Summary of Components of Hydraulic Control Unit, Brake Servo Unit/Master Brake Cylinder

Note

- *Removing and installing the hydraulic control unit completely ⇒ 45-17 page 2.*
- *Repairing the hydraulic control unit ⇒ 45-17 page 6.*
- *Mount bracket before assembling the brake lines.*
- *Do not bend brake lines when assembling or when connecting.*
- *Install brake hoses without transposition.*
- *Brake hoses must not come into contact with other components during operating condition.*
- *Do not remove the plugs on the connection threads and the holes in the parts carrying brake fluid until just before assembling.*
- *Tighten all the brake line pipe screws to a tightening torque of 14 Nm.*



1 - Hydraulic control unit
- ❑ ABS BOSCH 5.7
- ❑ ABS/EDL/TCS BOSCH 5.7
- ❑ assignment ⇒ Spare part catalogue
- ❑ fitted until CW 21/2004

2 - Brake line
- ❑ identification marking of the hydraulic unit „VL“
- ❑ to front left brake caliper

3 - Brake line
- ❑ identification marking of the hydraulic unit „VR“
- ❑ to front right brake caliper

4 - Brake line
- ❑ identification marking of the hydraulic unit „HZ2“
- ❑ Master brake cylinder/floating piston circuit to hydraulic control unit

5 - Brake line
- ❑ identification marking of the hydraulic unit „HZ1“
- ❑ Master brake cylinder/pressure rod piston circuit to hydraulic control unit

6 - Brake line
- ❑ identification marking of the hydraulic unit „HL“
- ❑ to wheel brake cylinder/rear left brake caliper

7 - Brake line
- ❑ identification marking of the hydraulic unit „HR“
- ❑ to wheel brake cylinder/rear right brake caliper

8 - Brake pressure sender 1 -G201-
- ❑ removing and installing ⇒ 45-17 page 10
- ❑ inspect ⇒ Chapter 45-10

- ❑ must only be replaced, but not repaired

9 - Line
- ❑ ABS/EDL/TCS/ESP BOSCH 5.7
- ❑ to ABS control unit

10 - Hydraulic control unit
- ❑ ABS/EDL/TCS/ESP BOSCH 5.7
- ❑ must not be repaired, replace completely in the event of faults
- ❑ Brake pressure sender 1 -G201- must be replaced, but not repaired
- ❑ assignment ⇒ Spare part catalogue
- ❑ fitted until KW 21/2004

11 - Line holder
- ❑ for brake line
- ❑ assignment ⇒ Spare part catalogue

12 - Bracket
- ❑ for brake line
- ❑ 2 units
- ❑ assignment ⇒ Spare part catalogue

13 - Bracket
- ❑ for brake line
- ❑ 3 units
- ❑ assignment ⇒ Spare part catalogue

14 - Brake servo unit
- ❑ inspect ⇒ Chapter 47-2
- ❑ removing and installing ⇒ Chapter 47-2

15 - Master brake cylinder
- ❑ cannot be repaired, replace completely in the event of faults
- ❑ Tightness test ⇒ Chapter 47-2
- ❑ removing and installing ⇒ Chapter 47-2

16 - Brake fluid reservoir

17 - Self-locking nuts, 20 Nm
- ❑ replace after each removal

18 - Bracket
- ❑ for ABS, ABS/ABS/EDL or ABS/EDL/TCS/ESP BOSCH 5.7

19 - Screw, 8 Nm

20 - Bracket
- ❑ for ABS, ABS/EDL/TCS or ABS/EDL/TCS/ESP BOSCH 5.7

21 - Hexagon collar nut, self-locking, 20 Nm
- ❑ replace after each removal

Removing and installing the hydraulic control unit

The removal and installation of the relevant hydraulic control unit is described according to the example of the ABS system BOSCH 5.7. Removal and installation is similar for the ABS/EDL/TCS or ABS/EDL/TCS/ESP system BOSCH 5.7.

WARNING!

- ***Make absolutely sure that no brake fluid gets into the plug connector housing of the hydraulic control unit. This may result in the corrosion of the contacts and to system failure.***
- ***Carefully clean out the plug connector housing with compressed air if it gets dirty.***
- ***Do not bend the brake lines around the hydraulic control unit.***

Special tools, test and measuring equipment and auxiliary items required

- Brake pedal arrester, e.g. -V.A.G 1238 B- or brake pedal load -V.A.G 1869/2-
- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B-, -V.A.G 1551/3C-, -VAS 5051/5A- or -VAS 5051/6A-
- Brake filling and bleeding device, e. g. -ROMESS S15-
- Bleeding bottle (commercially available)
- Repair kit SP-No. 1H0 698 311 A
- Brake fluid ⇒ Chapter 00-3

Removing

Note

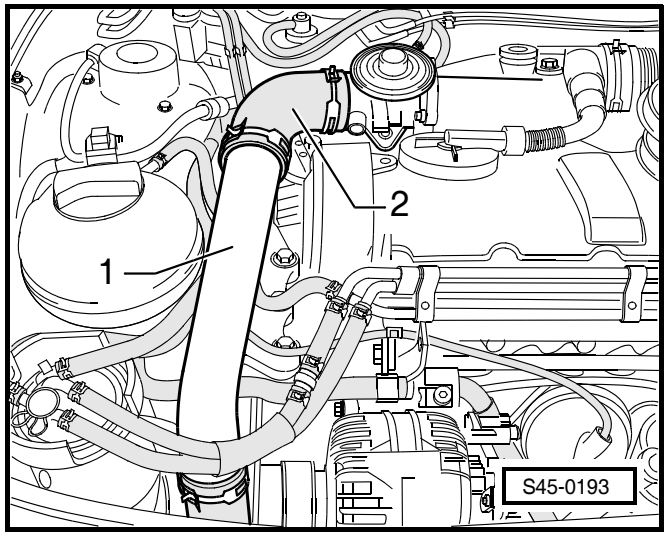
Before disconnecting the battery determine the code of radio sets fitted with anti-theft coding.

– Disconnect battery ⇒ Electrical System; Rep. Gr. 27.

– Remove engine cover ⇒ Engine, Mechanics; Rep. Gr. 10.

Vehicles with TDI PD Turbocharger engines

– Remove top charge-air pipe -1- with connecting hose -2- ⇒ TDI Engine, Mechanics; Rep. Gr. 21. ►



Continued for all vehicles

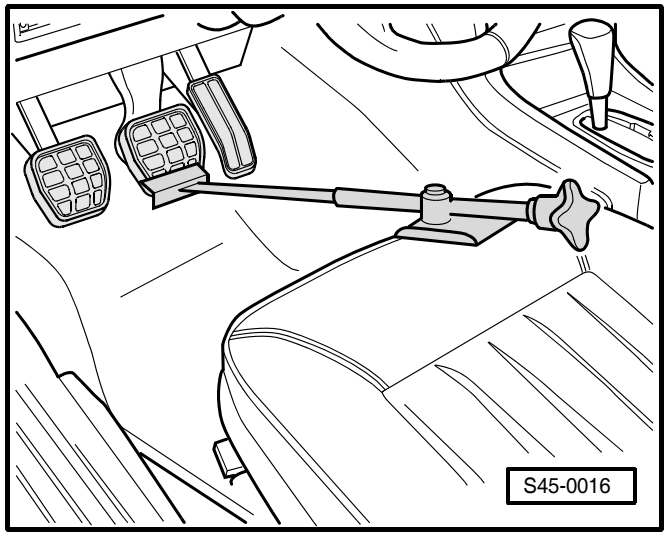
– Actuate brake pedal and arrest with brake pedal arrester. ►

– Attach the bleeder hose of the bleeding bottle onto the vent valve of the front left brake caliper and open bleeder valve.

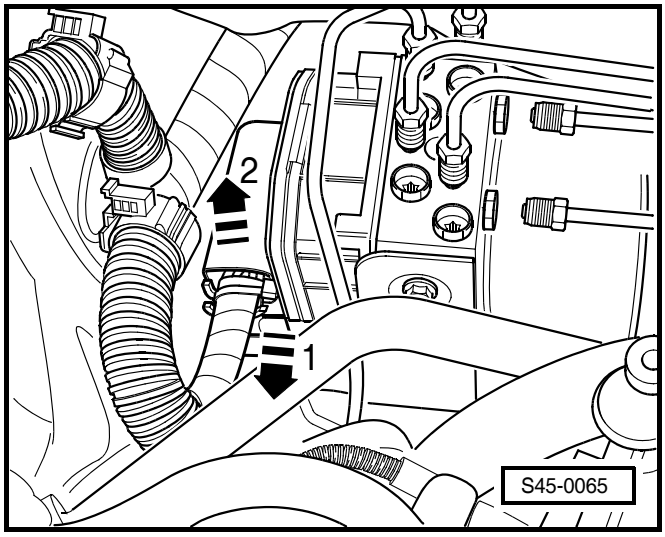
– Shut the vent valve once the brake fluid has flown out.

– Disconnect the bleeder hose from the vent valve.

– Place sufficient non-fluffing cloths under and around the hydraulic control unit.



– Unlatch the multi-pin connector -arrow 1- and pull off upwards from the control unit -arrow 2-.
– Close the plug connector housing of the control unit with a cap.
– If necessary remove the brake lines from the line holder.
– Mark brake lines.
– Unscrew brake lines from hydraulic control unit.
– Close off immediately brake lines.
– Shut off immediately threaded bores (brake line connections) on the hydraulic control unit with plugs from repair kit SP No. 1 H0 698 311 A.



vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

Note

To avoid overvoltage and static discharge do not touch the plug contacts of the brake pressure sender 1 -G201-.

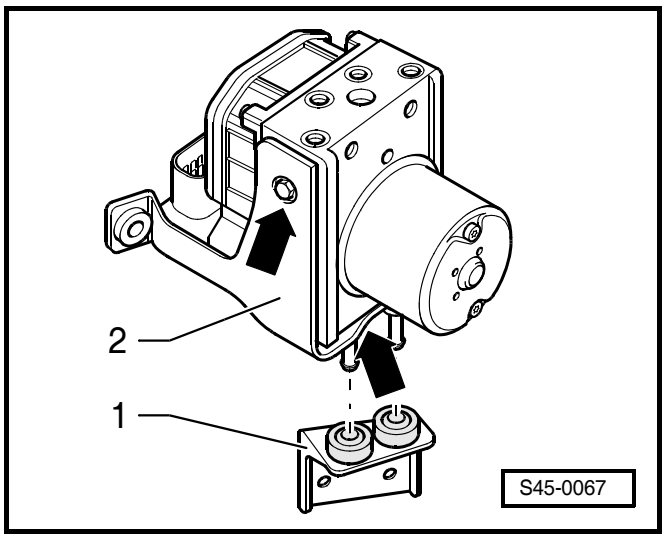
– Unplug connector from brake pressure sender 1 -G201-.

Continued for all vehicles

– Remove right drive shaft from the flange shaft and tie up. Avoid damaging the paintwork on the drive shaft during this operation.

♦ Drive shaft with constant velocity joint ⇒ Chapter 40-4
♦ Drive shaft with tripod joint ⇒ Chapter 40-5

– Remove shield from the assembly carrier ⇒ Chap. 40-1.
– Unscrew the nuts of the two hydraulic control unit brackets.
– Remove hydraulic control unit with brackets from the threaded bores at the body.
– Remove the hydraulic control unit downwards from the vehicle.
– Separate bracket -1- from the fixing bolt of the bracket -2-.
– Release the screws -arrows- and remove hydraulic control unit from bracket -2-.

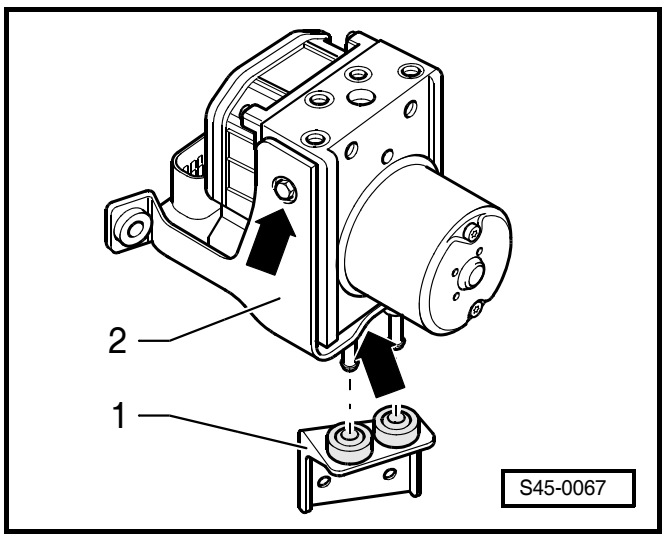


Installing

Note

♦ *New hydraulic control units are filled with hydraulic oil and bleed.*
♦ *Only then remove plugs from the hydraulic unit when the relevant brake line is installed.*
♦ *If the plugs were already removed from the hydraulic unit before the brake line is installed, then brake fluid may escape and adequate filling and bleeding can no longer be guaranteed.*

– Screw bracket -2- onto the hydraulic control unit.



– Tighten up the screws -arrows- fully to the specified tightening torque.
– Insert bracket -1- onto the fixing bolt of the bracket -2-.

Note

Do not immediately tighten the nuts for securing the hydraulic control unit to the body. This facilitates the screwing of the individual brake lines onto the hydraulic control unit.

– Install the hydraulic control unit and screw on nuts as well as collar nut.

vehicles with ABS/EDL/TCS/ESP BOSCH 5.7

– Mount plug on brake pressure sender 1 -G201-.

Continued for all vehicles

– Remove plugs from the brake lines to be installed.

WARNING!

Pay attention to the correct channel assignment of the brake lines. Interchanging the brake lines will result in dangerous brake control actions.

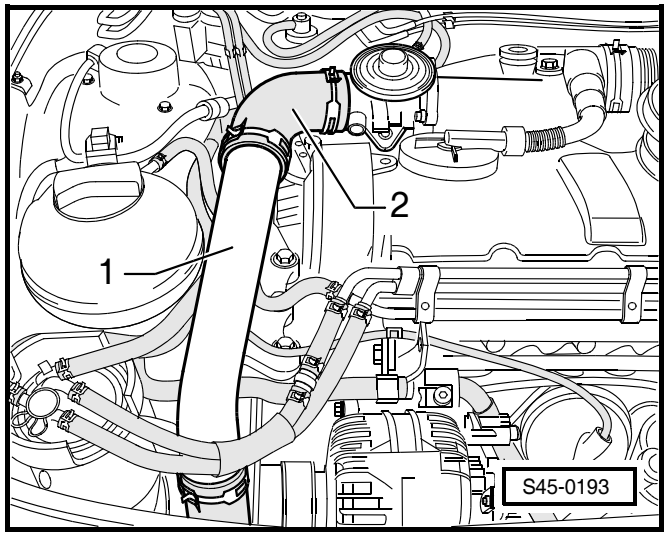
– Connect the brake line to the hydraulic control unit and tighten ⇒ 45-17 page 1.
– Tighten the collar nut and nuts for securing the hydraulic control unit to the specified tightening torque.
– Fit drive shaft to flange shaft.
- Drive shaft with constant velocity joint ⇒ Chapter 40-4
- Drive shaft with tripod joint ⇒ Chapter 40-5

– If necessary install shield on the assembly carrier ⇒ Chap. 40-1.
– Insert the multi-plug connector on the control unit and lock.

Further installation occurs in reverse order.

Vehicles with TDI PD Turbocharger engines

– Install top charge-air pipe -1- with connecting hose -2- ⇒ TDI Engine, Mechanics; Rep. Gr. 21.



Continued for all vehicles

– Installing engine cover ⇒ Engine, Mechanics; Rep. Gr. 10.
– Connect battery ⇒ Electrical System; Rep. Gr. 27.
– Bleed brake system ⇒ Chapter 47-4.
– Coding control unit ⇒ Chap. 45-8
– Perform null balance of the steering angle sender -G85- (only for vehicles with ABS/EDL/TCS/ESP) ⇒ Chap. 45-13.

– Perform automatic test sequence ⇒ Chapter 45-5 either using the vehicle system tester -V.A.G 1552- or the vehicle system test ⇒ Chapter 45-4 using the vehicle diagnosis, measurement and information system -VAS 5051-.

If a fault is stored in the fault memory:

– Eliminating fault ⇒ Chapter 45-6.

– Erasing fault memory ⇒ Chapter 45-5.

Note

For vehicles with ABS/EDL/TCS or ABS/EDL/TCS/ESP BOSCH 5.7 perform a test drive after bleeding with at least one ABS control!

Tightening torques:

Hydraulic control unit to bracket	8 Nm
Bracket to hydraulic control unit and to body ♦ Use new nuts and new hexagon collar nut!	20 Nm
Brake line to hydraulic control unit	14 Nm
Drive shaft to flange shaft - gearbox ♦ Use new screws!	M8 = 40 Nm M10 = 70 Nm
Shield to assembly carrier	35 Nm

Repairing the hydraulic control unit ABS or ABS/EDL/TCS BOSCH 5.7

The hydraulic control units ABS and ABS/EDL/TCS BOSCH 5.7 must be repaired, while the hydraulic control units ABS/EDL/TCS/ESP BOSCH 5.7 must not be disassembled. It must be replaced in case of repairs. For ABS/EDL/TCS/ESP only the brake pressure sender 1 -G201- must be replaced ⇒ 45-17 page 10**.**

Note

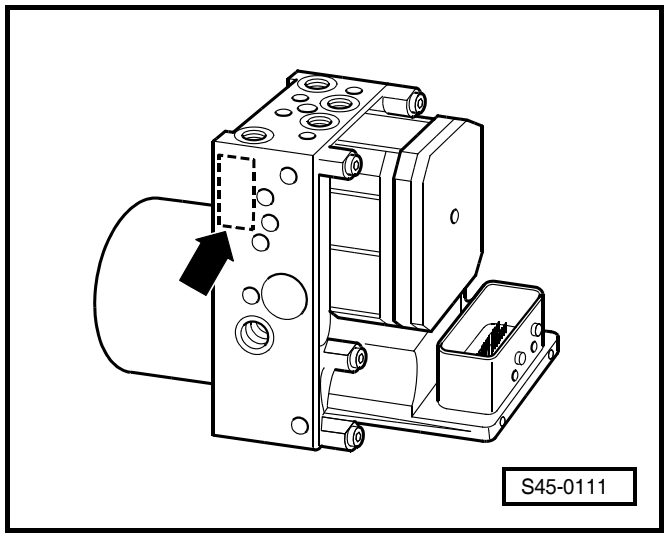
- *Inspecting and repairs of the hydraulic control unit must only be performed by skilled personnel in approved automobile workshops (Bosch service centres or contract dealers of the vehicle manufacturer).*
- *Observe the notes in the manufacturer's instructions for the replacement of hydraulic control units.*

Special tools, test and measuring equipment and auxiliary items required

- Caliper gauge (commercially available)

Note

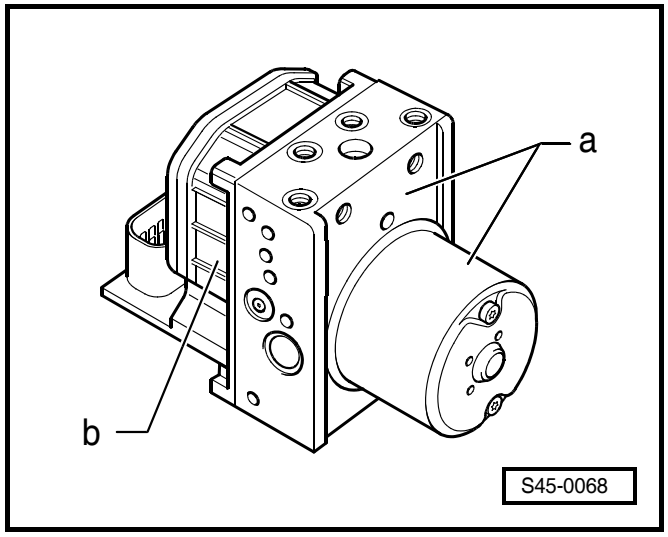
- *The sealing surface on the hydraulic control unit must be clean and undamaged. It must never be reworked, e.g. with files, scrapers etc. If necessary replace the hydraulic unit.*
- *The gasket on the control unit must not be removed, it cannot be replaced.*
- *The screws (inner Torx T20) of the hydraulic unit/control unit must be replaced after each disassembling. Use the screws included in the parts kit. Tightening must occur in the prescribed sequence and in steps.*
- *If the control unit is being replaced tentatively tighten the fixing screws only slightly Tighten the screws to the specified torque once the control unit is correctly positioned on the hydraulic control unit.*
- *Maximum 5 tightening procedures (hydraulic unit) may be carried out throughout the entire life of the hydraulic control unit. Pay attention to the colour markings (approx. 3 mm wide red lines) on the hydraulic control unit. Replace the complete hydraulic control unit if more than 5 tightening procedures have been performed (-arrow- area for colour markings).*
- *The threads in the hydraulic unit for securing the control unit must not be rethreaded. If the thread is damaged (screws are hard to tighten by hand or they cannot be tightened to the prescribed torque) replace the hydraulic control unit.*
- *Blowing out of the control unit or the hydraulic unit with compressed air to secure an oily or aqueous film on and between the valve domes or the solenoid coils is not permissible. Only use moisture-free and oil-free compressed air, e.g. from a spray. Cleaning with hydrocarbon solvents is not allowed.*
- *If the hydraulic control unit is open protect the valve domes, solenoid coils, contact springs against damage and soiling.*
- *If the hydraulic control unit is open it is not permissible to apply a voltage to the contact springs of the hydraulic pump. Risk of contact arcing.*
- *Repair is only possible with the hydraulic control unit removed.*
- *Disassembly and assembly of the hydraulic control unit is described on an ABS unit BOSCH 5.7. The procedure for the ABS/EDL/TCS unit BOSCH 5.7 is identical. The ABS/EDL/TCS/ESP unit BOSCH 5.7 must not be disassembled. It must be replaced in case of repairs. Only the brake pressure sender 1 -G201- must be replaced ⇒ 45-17 page 10.*



– Remove hydraulic control unit with bracket ⇒ 45-17 page 2

Disassembling the hydraulic control unit

Hydraulic unit for ABS -N55- with return flow pump for ABS -V39- (-a-):



- Hydraulic unit: The valve block includes the control valve and the contact springs of the hydraulic pump.
- Do not separate the return flow pump for ABS -V39- from the hydraulic unit for ABS -N55-.

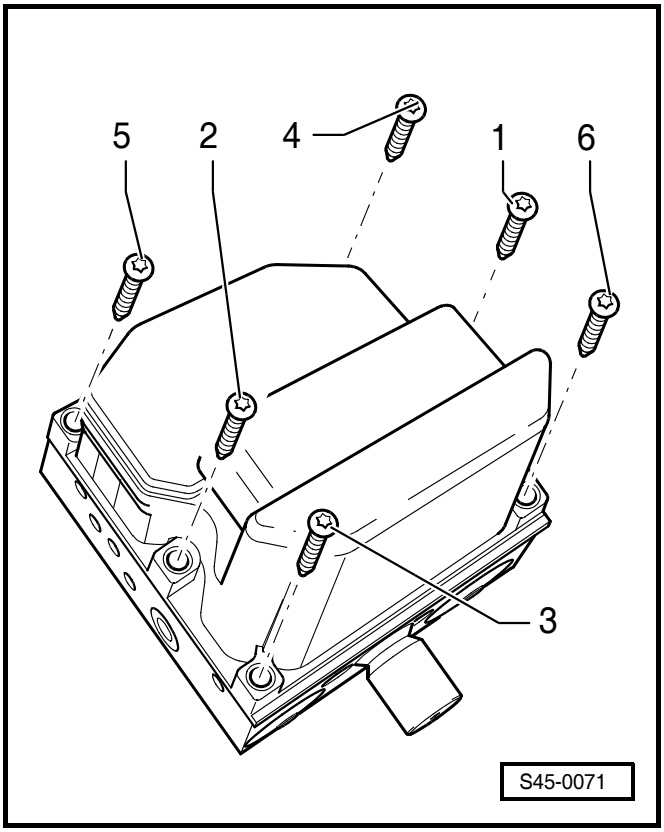
ABS control unit -J104- (-b-):

- Contact assignment ⇒ Chap. 45-15

Note

The hydraulic control unit ABS/EDL/TCS/ESP BOSCH 5.7 must not be disassembled. It must be replaced as a complete unit in the case of repairs. Only the brake pressure sender 1 -G201- must be replaced ⇒ 45-17 page 10.

– Release inner Torx screws T20 -Postions 1 through to 6-.

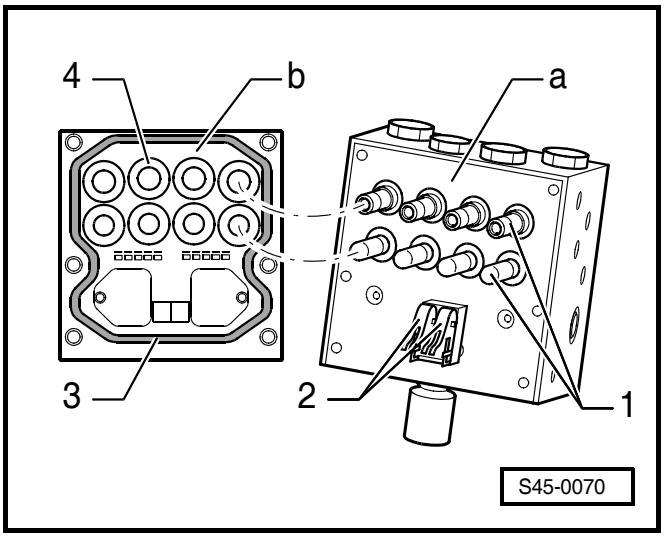


When tightening the control unit -b- of the hydraulic unit -a- make sure the valve domes -1- are not tilted along with the solenoid coils -4-.

3 - Silicone seal

– Cover the solenoid coils of the control unit.

– Protect the valve domes and contact springs -2- of the return flow pump for ABS -V39- against damage and soiling. Do not use fluffing cloths or a transport protection of an already installed spare part hydraulic pump. This is a requirement for possible guarantee claims.



Assembling the hydraulic control unit

vehicles with ABS/EDL/TCS BOSCH 5.7

If new or removed control units -1- are installed again, inspect the heat conduction posts -3-.

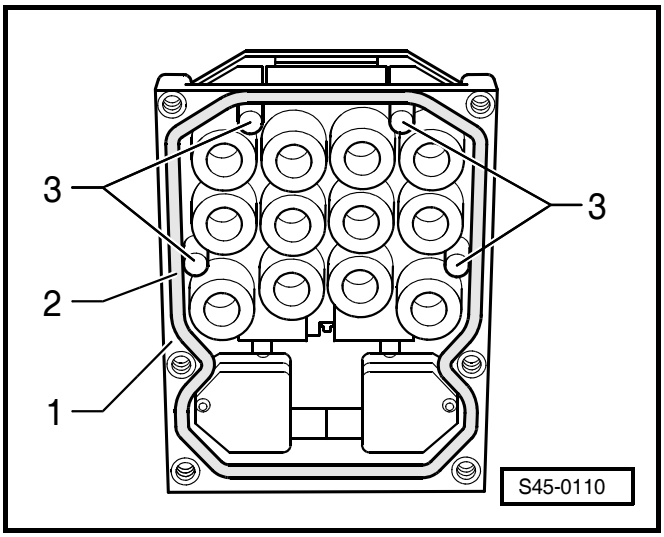
– Inspect the end faces of the heat conduction posts for good heat conduction properties. The faces must not exhibit any deposit, e.g. oxidation.

– Check projection of the posts using a gauge.

Dimension must be of 0.8…1.0 mm between the top side of the heat conduction posts and the seal -2-.

– Press the end face of the heat conduction posts with your thumb, they must give.

If faults are found during one of the 3 test steps, the control unit must be replaced.



Continued for all vehicles

– Inspect the sealing surface on the hydraulic unit for soiling, if necessary clean with white spirits and a non-fluffing paper or linen cloth.
– If an oily or aqueous film appears on the surface of the hydraulic unit, clean with white spirits and a non-fluffing paper or linen cloth.
– If there is a considerable oily and aqueous film between the valves use moisture-free and oil-free compressed air to blow it out.
– If damage is noticed on the hydraulic unit, e.g. scoring or scratching etc., near the seal, replace the hydraulic unit.
– Inspect the contact springs of the hydraulic pump for burning points and oxidation. Reworking or cleaning is not possible, replace the hydraulic unit.

Note

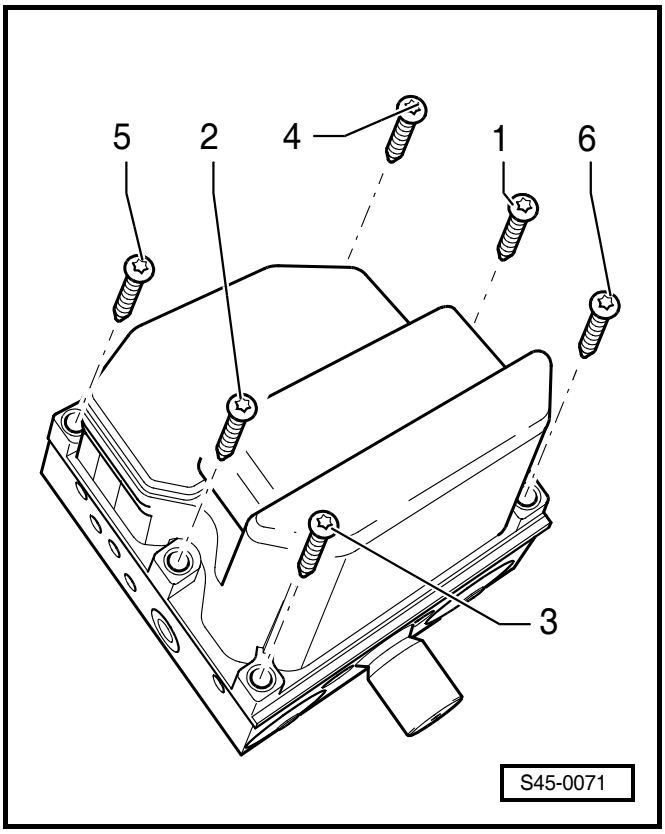
- *Before fitting the control unit to the hydraulic unit make sure the seal protrudes by min. 0.1 mm from the control unit housing.*
- *When assembling the control unit and the hydraulic unit make sure the valve domes of the hydraulic unit do not tilt along with the solenoid coils of the control unit.*

– Place the control unit on the hydraulic unit and guide the solenoid coils over the valves by exerting a slight pressure. While doing so center the control unit relatively to the hydraulic unit. The edge of the control unit must engage in the groove of the hydraulic unit.
– Press by hand on the control unit until it fixes in place with the two centre screws.

Note

- *Screw on the hydraulic unit and the control unit in the prescribed sequence and in steps. Tightness will not be guaranteed if this is not observed.*
- *Only use new inner Torx screws from the parts kit.*
- *When screwing together make sure the left and right gap between the control unit and the hydraulic unit is always the same.*

– First screw in the inner Torx screws and tighten them by hand in the alternating sequence 1 - 2, 3 - 4, 5 - 6. ►
– Tighten all inner Torx screws in the alternating sequence 1 - 2, 3 - 4, 5 - 6 to the prescribed torque.



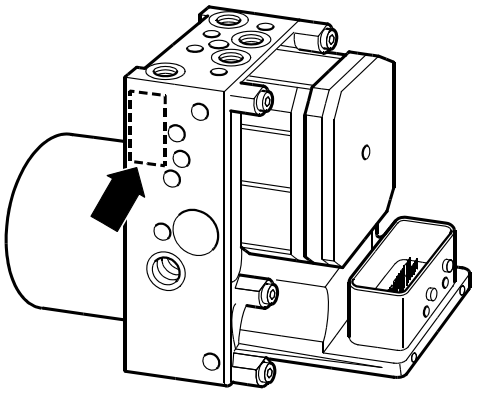
– Indicate each fitting of the hydraulic unit with the control unit in the area -arrow- with a permanent mark approx. 3 mm wide. Colour: red

  For this use e.g. lead seal enamel.

– Install hydraulic control unit with bracket ⇒ 45-17 page 2.

Tightening torque:

Control unit to hydraulic unit ♦ Use new screws!	3 Nm



S45-0111

Removing and installing brake pressure sender 1 -G201- - vehicles with ABS/EDL/ TCS/ESP BOSCH 5.7

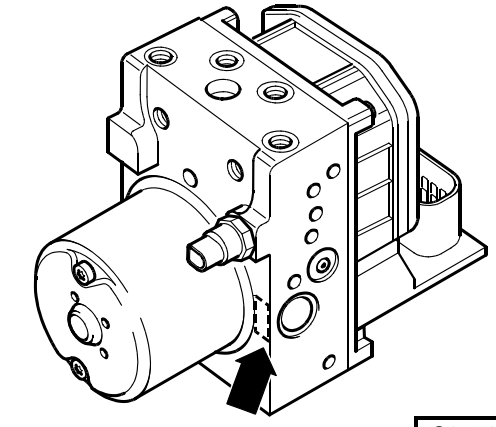
A description of the structure and function of the brake pressure sender 1 -G201- can be found in self-study programme no. 42.

Special tools, test and measuring equipment and auxiliary items required

- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3-, -V.A.G 1551/3A-, -V.A.G 1551/3B-, -V.A.G 1551/3C-, -VAS 5051/5A- or -VAS 5051/6A-
- Hexagon socket wrench insert, e. g. -900S Lg 24-

Note

- *Repair of the brake pressure sender 1 -G201- is not allowed. Only the brake pressure sender 1 -G201- must be replaced.*
- *No additional seals or lubricants may be used when sealing the sender/hydraulic unit. A thread moistened with brake fluid is allowed.*
- *The sealing surfaces of the conical seat on the sender and on the hydraulic unit must not be damaged,e.g. small surfaces, grooves.*
- *The threads on the sender and on the hydraulic unit must not be damaged. Re-cutting the thread is not allowed. Replace the complete hydraulic unit if the thread is damaged (sender difficult to screw in).*
- *Replacement of the brake pressure sender 1 -G201- is limited to a maximum of 4 repeat screwing procedures (torque connections). Pay attention to the colour markings (approx. 3 mm wide green lines) on the hydraulic control unit (-arrow- for colour markings). If more than 4 tightening procedures are performed the complete hydraulic unit must be replaced*



S45-0112

Removing

– Remove the hydraulic control unit ⇒ 45-17 page 2.

– Unscrew brake pressure sender 1 -G201-

– Check the ball sealing surface of the hydraulic unit for damage.

  Teplace the hydraulic unit if they are damaged (e.g. small surfaces, grooves). Reworking of the sealing surface is not allowed.

Installing

– Screw in the brake pressure sender 1 -G201- by hand up to the stop and tighten to the prescribed torque.
– Indicate each fitting of the sender brake pressure sender -G201- with the control unit in the area -arrow- with a permanent mark approx. 3 mm wide (green).
– Installing the hydraulic control unit ⇒ 45-17 page 2.
– Inspect the tightness on the connection of the brake pressure sender 1 -G201- under pressure (brake pedal pressed).

If brake fluid escapes:

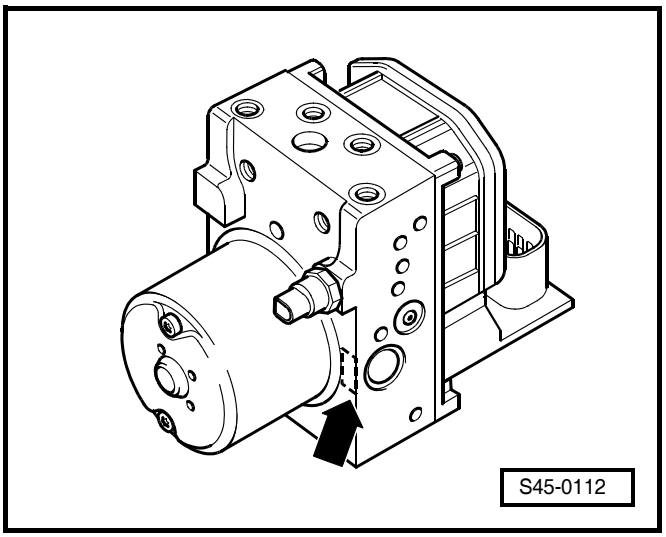
– Tighten up the sender fully to the specified tightening torque.

If brake fluid still escapes:

– Replace the brake pressure sender 1 -G201- or hydraulic unit and check tightness.
– Bleed brake system ⇒ Chapter 47-4.
– Perform automatic test sequence ⇒ Chapter 45-5 either using the vehicle system tester -V.A.G 1552- or the vehicle system test ⇒ Chapter 45-4 using the vehicle diagnosis, measurement and information system -VAS 5051-.

If faults are stored in the fault memory:

– Eliminating fault ⇒ Chapter 45-6.
– Erasing fault memory ⇒ Chapter 45-5.



Note

For vehicles with ABS/EDL/TCS or ABS/EDL/TCS/ESP BOSCH 5.7 perform a test drive after bleeding with at least one ABS control!

Tightening torque:

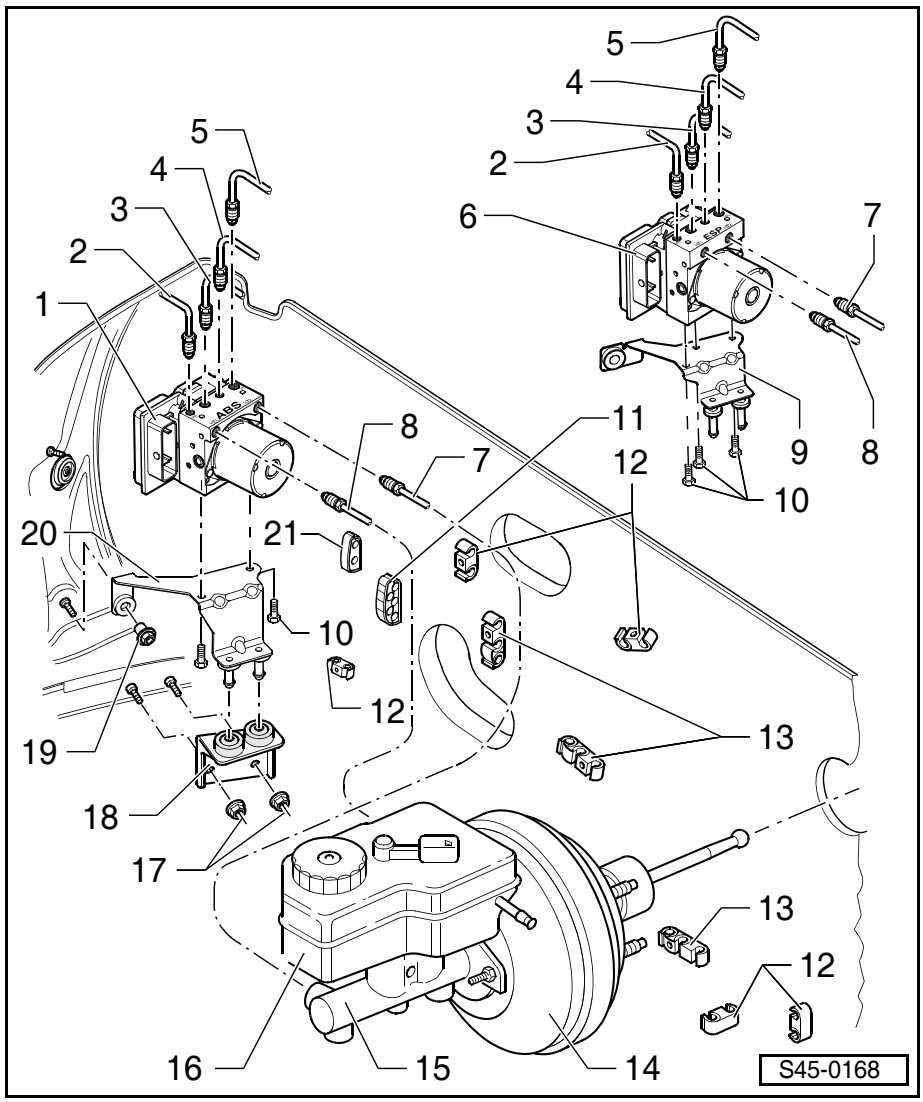
Brake pressure sender 1 -G201- on hydraulic unit	20 Nm

45-18 Hydraulic control unit (ABS systems BOSCH 8.0), Brake servo unit/Master brake cylinder

Summary of Components of Hydraulic Control Unit Brake Servo Unit/Master Brake Cylinder

Note

- *Removing and installing the hydraulic control unit completely ⇒ 45-18 page 3.*
- *Mount bracket before assembling the brake lines.*
- *Do not bend brake lines when assembling or when connecting.*
- *Install brake hoses without transposition.*
- *Brake hoses must not come into contact with other components during operating condition.*
- *Do not remove the plugs on the connection threads and the holes in the parts carrying brake fluid until just before assembling.*
- *Tighten all the brake line pipe screws to a tightening torque of 14 Nm.*
- *The repair of the hydraulic control unit ABS/ASR/ESP BOSCH 8.0 is not permissible.*



1 - Hydraulic control unit
- ❑ ABS BOSCH 8.0
- ❑ removing and installing ⇒ 45-18 page 3
- ❑ ABS/TCS BOSCH 8.0
- ❑ assignment ⇒ Spare part catalogue
- ❑ identification marking of the hydraulic unit „ABS“
- ❑ fitted as of CW 22/2004

2 - Brake line
- ❑ identification marking of the hydraulic unit „VR“
- ❑ to front right brake caliper
- ❑ Connect ⇒ 45-18 page 7

3 - Brake line
- ❑ identification marking of the hydraulic unit „HL“
- ❑ to wheel brake cylinder/rear left brake caliper
- ❑ Connect ⇒ 45-18 page 7

4 - Brake line
- ❑ identification marking of the hydraulic unit „HR“
- ❑ to wheel brake cylinder/rear right brake caliper
- ❑ Connect ⇒ 45-18 page 7

5 - Brake line
- ❑ identification marking of the hydraulic unit „VL“
- ❑ to front left brake caliper
- ❑ Connect ⇒ 45-18 page 7

6 - Hydraulic control unit
- ❑ ABS/TCS/ESP BOSCH 8.0
- ❑ removing and installing ⇒ 45-18 page 3
- ❑ assignment ⇒ Spare part catalogue

- ❑ identification marking of the hydraulic unit „ESP“
- ❑ fitted as of CW 22/2004

7 - Brake line
- ❑ identification marking of the hydraulic unit „HZ2“
- ❑ Master brake cylinder/floating piston circuit to hydraulic control unit
- ❑ Connect ⇒ 45-18 page 7

8 - Brake line
- ❑ identification marking of the hydraulic unit „HZ1“
- ❑ Master brake cylinder/pressure rod piston circuit to hydraulic control unit
- ❑ Connect ⇒ 45-18 page 7

9 - Bracket
- ❑ for hydraulic control unit ABS/TCS/ESP BOSCH 8.0
- ❑ removing and installing ⇒ 45-18 page 6

10 - Screws, 8 Nm
- ❑ for holder to hydraulic control unit

11 - Line holder
- ❑ for brake line
- ❑ assignment ⇒ Spare part catalogue

12 - Bracket
- ❑ for brake line
- ❑ 2 units
- ❑ assignment ⇒ Spare part catalogue

13 - Bracket
- ❑ for brake line
- ❑ 3 units
- ❑ assignment ⇒ Spare part catalogue

14 - Brake servo unit
- ❑ inspect ⇒ Chapter 47-2
- ❑ removing and installing ⇒ Chapter 47-2

15 - Master brake cylinder
- ❑ cannot be repaired, replace completely in the event of faults
- ❑ Tightness test ⇒ Chapter 47-2
- ❑ removing and installing ⇒ Chapter 47-2

16 - Brake fluid reservoir

17 - Self-locking nuts, 20 Nm
- ❑ replace after each removal
- ❑ for bracket to body

18 - Bracket
- ❑ for ABS, ABS/TCS, ABS/TCS/ESP BOSCH 8.0
- ❑ removing and installing ⇒ 45-18 page 6

19 - Hexagon collar nut, 20 Nm
- ❑ replace after each removal
- ❑ for bracket to body

20 - Bracket
- ❑ for hydraulic control unit ABS, ABS/TCS BOSCH 8.0
- ❑ removing and installing ⇒ 45-18 page 6

21 - Bracket
- ❑ for brake line
- ❑ 2 units
- ❑ assignment ⇒ Spare part catalogue

Removing and installing the hydraulic control unit

WARNING!

- ***Make absolutely sure that no brake fluid gets into the plug connector housing of the hydraulic control unit. This may result in the corrosion of the contacts and to system failure.***
- ***Carefully clean out the plug connector housing with compressed air if it gets dirty.***
- ***Do not bend the brake lines around the hydraulic control unit.***

Special tools, test and measuring equipment and auxiliary items required

- Brake pedal arrester, e.g. -V.A.G 1238 B- or brake pedal load -V.A.G 1869/2-
- Vehicle system tester -V.A.G 1552- or vehicle diagnosis, measurement and information system -VAS 5051-
- Diagnostic cable -V.A.G 1551/3, 3A, 3B oder 3C-, -VAS 5051/5A- or -VAS 5051/6A-
- Brake filling and bleeding device, e. g. -ROMESS S15-
- Bleeding bottle (commercially available)
- Repair kit SP-No. 1H0 698 311 A
- Brake fluid ⇒ Chapter 00-3

Removing

Note

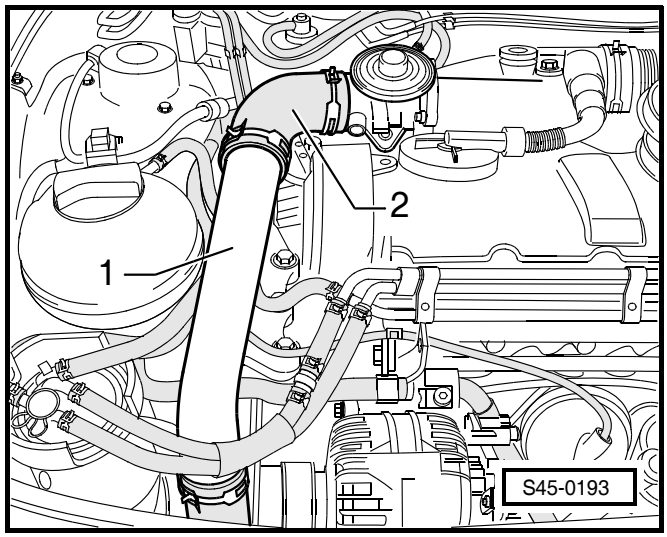
Before disconnecting the battery determine the code of radio sets fitted with anti-theft coding.

– Disconnect battery ⇒ Electrical System; Rep. Gr. 27.

– Remove engine cover ⇒ Engine, Mechanics; Rep. Gr. 10.

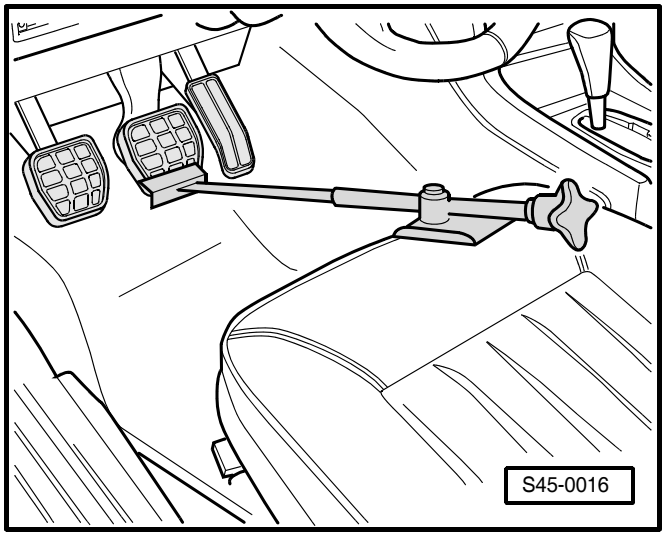
Vehicles with TDI PD Turbocharger engines

– Remove top charge-air pipe -1- with connecting hose -2- ⇒ TDI Engine, Mechanics; Rep. Gr. 21. ►



Continued for all vehicles

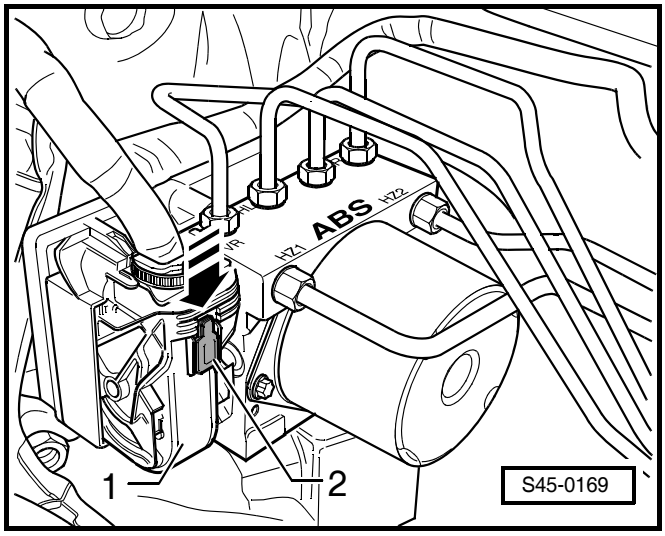
– Actuate brake pedal and arrest with brake pedal arrester.
– Attach the bleeder hose of the bleeding bottle onto the vent valve of the front left brake caliper and open bleeder valve.
– Shut the vent valve once the brake fluid has flown out.
– Disconnect the bleeder hose from the vent valve.
– Place sufficient non-fluffing cloths under and around the hydraulic control unit.



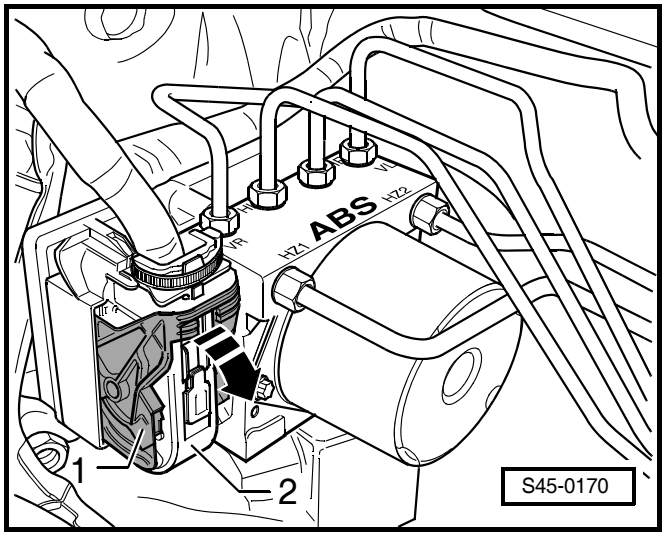
Unlatch the multi-pin connector

The unlatching of the multi-pin connector is described according to the example of the ABS system BOSCH 8.0. On the ABS/TCS and ABS/TCS/ESP systems BOSCH 8.0 the unlatching is identical.

– Release multi-pin connector -1-.
– Insert red fuse -2- up to the stop in -direction of the arrow-.

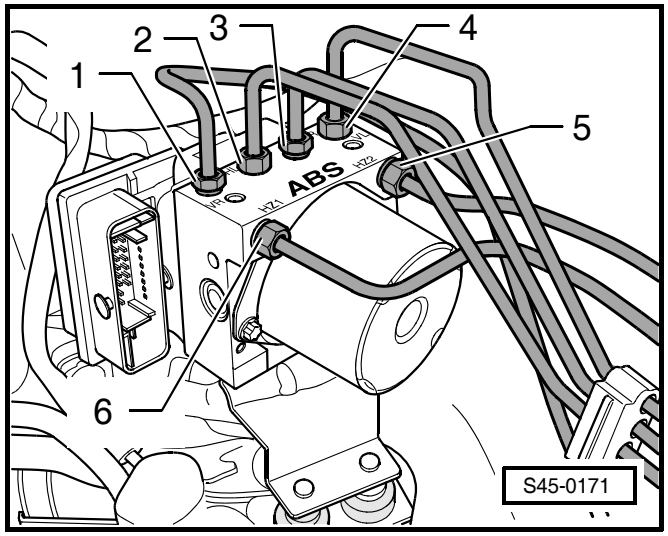


– Swivel the clamp downwards -1- up to the stop in the -direction of arrow-.
– Pull out multi-pin connector -2- from ABS control unit -J104-.
– Close the plug connector of the ABS control unit -J104- with a cap.



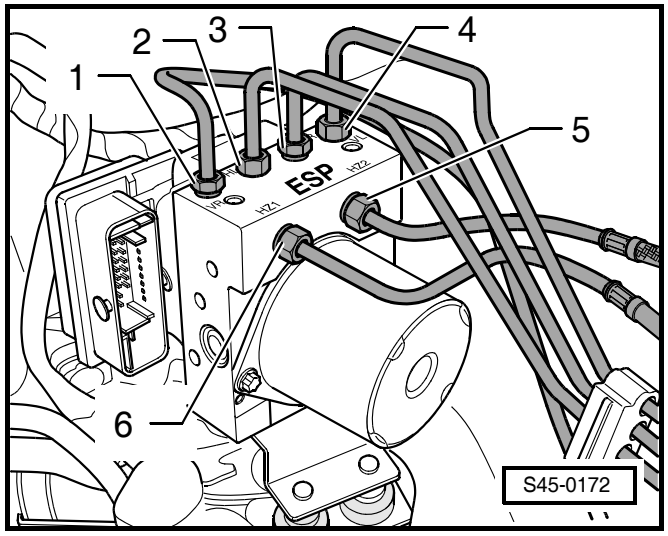
Unscrew brake lines from hydraulic control unit.

ABS, ABS/TCS BOSCH 8.0



– If necessary remove the brake lines from the line holder.
– Mark brake lines -1…6-.
– Unscrew brake lines -1…6- from hydraulic control unit.
– Close off immediately brake lines.
– Shut off immediately threaded bores (brake line connections) on the hydraulic control unit with plugs from repair kit SP No. 1 H0 698 311 A.

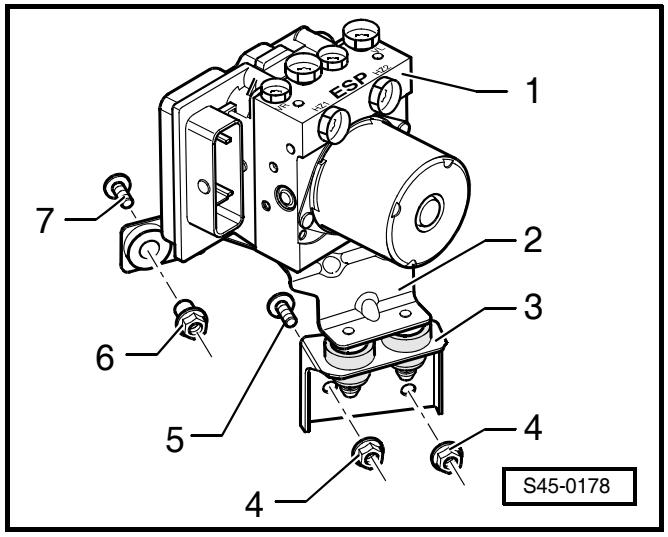
ABS/TCS/ESP BOSCH 8.0



– If necessary remove the brake lines from the line holder.
– Mark brake lines -1…6-.
– Unscrew brake lines -1…6- from hydraulic control unit.
– Close off immediately brake lines.
– Shut off immediately threaded bores (brake line connections) on the hydraulic control unit with plugs from repair kit SP No. 1 H0 698 311 A.

Remove the hydraulic control unit

The removal of the hydraulic control unit is described on an ABS/TCS/ESP unit. The removal of an ABS or an ABS/TCS unit occurs in the same way as for the ABS/TCS/ESP unit.



– Unscrew nuts -4- from bracker -3-.
– Unscrew hexagon collar nut -6-.
– Remove the hydraulic control unit ABS, ABS/TCS or ABS/TCS/ESP BOSCH 8.0 -1- with bracket -2- and -3- upwards out of the vehicle.

5 - Threaded bores welded to the body
7 - Threaded bores welded to the body

Installing

Note

- *New hydraulic control units are filled with hydraulic oil and bleed.*
- *Only then remove plugs from the hydraulic unit when the relevant brake line is installed.*
- *If the plugs were already removed from the hydraulic unit before the brake line is installed, then brake fluid may escape and adequate filling and bleeding can no longer be guaranteed.*

Installation is performed in the reverse order. Pay attention to the following points:

WARNING!

Pay attention to the correct channel assignment of the brake lines. Interchanging the brake lines will result in dangerous brake control actions.

– Connecting the brake lines ⇒ 45-18 page 7

– Make sure that the multi-pin connector latches correctly with the ABS control unit -J104-.

– Remove brake pedal arrester, e.g. -V.A.G 1238 B- or brake pedal load -V.A.G 1869/2-

– Bleed brake system ⇒ Chapter 47-4.

– Code ABS control unit -J104-:

- using vehicle system tester -V.A.G 1552- ⇒ Chapter 45-9.
- using vehicle diagnosis, measurement and information system -VAS 5051- ⇒ Chapter 45-4.

– Perform test drive after the bleeding of air with at least one ABS adjustment.

Tightening torques:

Brake line to hydraulic control unit	14 Nm
Bracket with hexagon collar nut to body ♦ Use new nut!	20 Nm
Bracket with nuts to body ♦ Use new nuts!	20 Nm

Removing and installing bracket for the hydraulic control unit

Removing and installing bracket for ABS or ABS/TCS BOSCH 8.0 ►

Removing

– Removing the hydraulic control unit ABS or ABS/TCS BOSCH 8.0 ⇒ 45-18 page 3.

– Separate bracket -4- from the fixing bolt of the bracket -2-.

– Release screws -3- (2x).

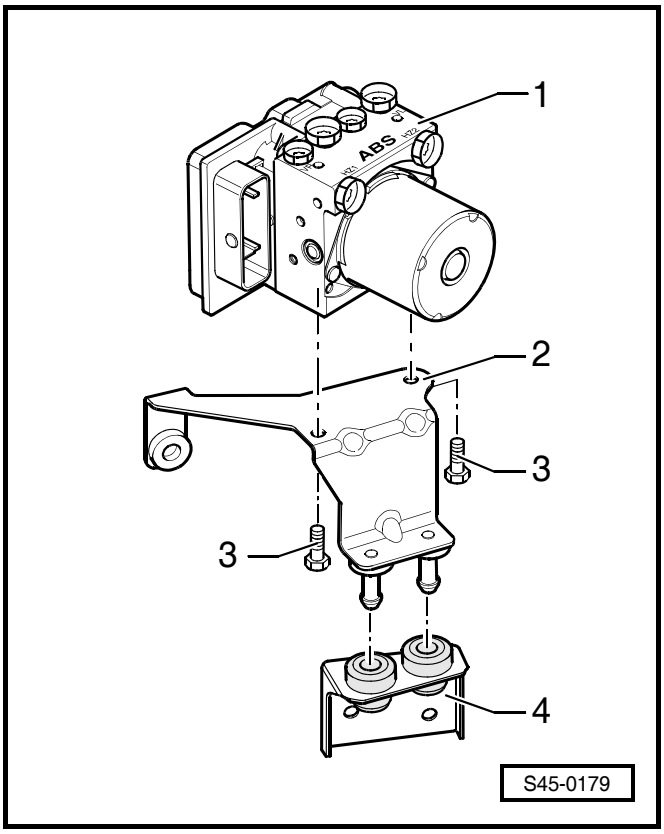
– Remove bracket -2- from hydraulic control unit -1-.

Installing

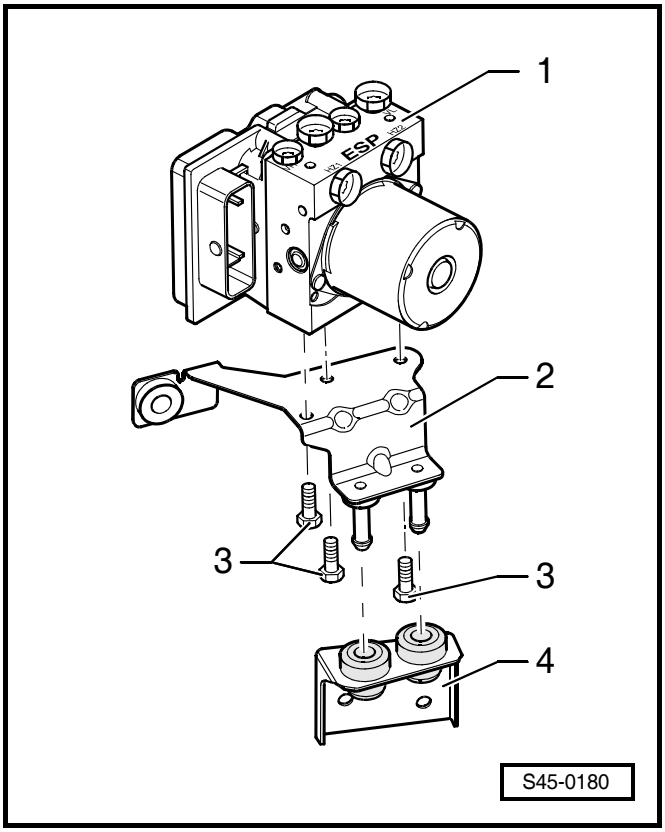
Installation is carried out in the reverse order.

Tightening torque:

Bracket to hydraulic control unit	8 Nm



Removing and installing bracket for ABS/TCS/ESP BOSCH 8.0 ►



Removing

– Removing the hydraulic control unit ABS/TCS/ESP BOSCH 8.0 ⇒ 45-18 page 3.
– Separate bracket -4- from the fixing bolt of the bracket -2-.
– Release screws -3- (3x).
– Remove bracket -2- from hydraulic control unit -1-.

Installing

Installation is carried out in the reverse order.

Tightening torque:

Bracket to hydraulic control unit	8 Nm

Connecting the brake lines

Note

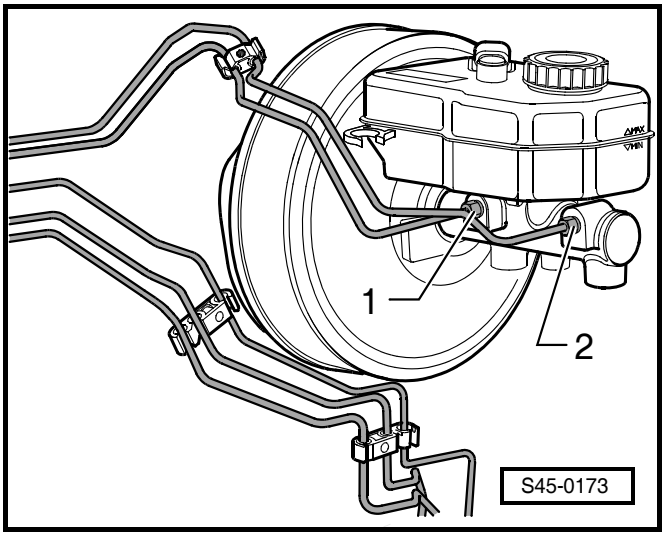
- *Mount braket before assembling the brake lines.*
- *Do not bend brake lines when assembling or when connecting.*
- *Install brake hoses without transposition.*
- *Brake hoses must not come into contact with other components during operating condition.*
- *Do not remove the plugs on the connection threads and the holes in the parts carrying brake fluid until just before assembling.*
- *Tightening torque of pipe screws for brake lines of 14 Nm.*

WARNING!

Pay attention to the correct channel assignment of the brake lines. Interchanging the brake lines will result in dangerous brake control actions.

vehicles with ABS or ABS/TCS BOSCH 8.0

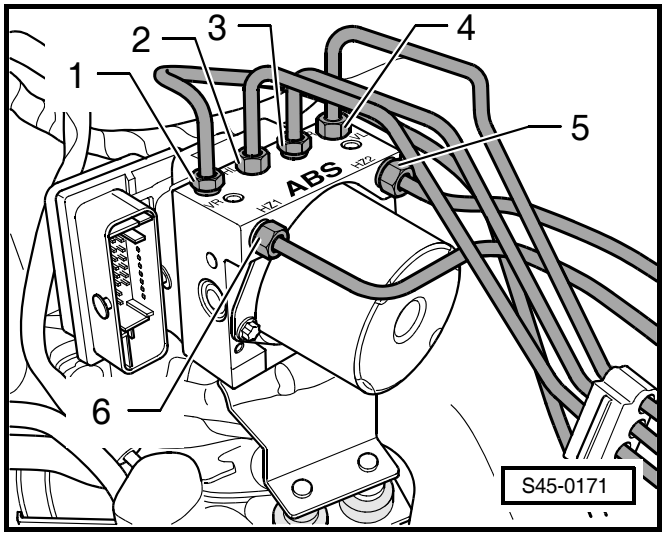
Connecting the brake lines to the master brake cylinder ►



Pos.	Denomination	Connecting points
1	HZ1	Master brake cylinder/push rod piston circuit
2	HZ2	Master brake cylinder/floating piston circuit

Connecting the brake lines to the hydraulic control unit ►

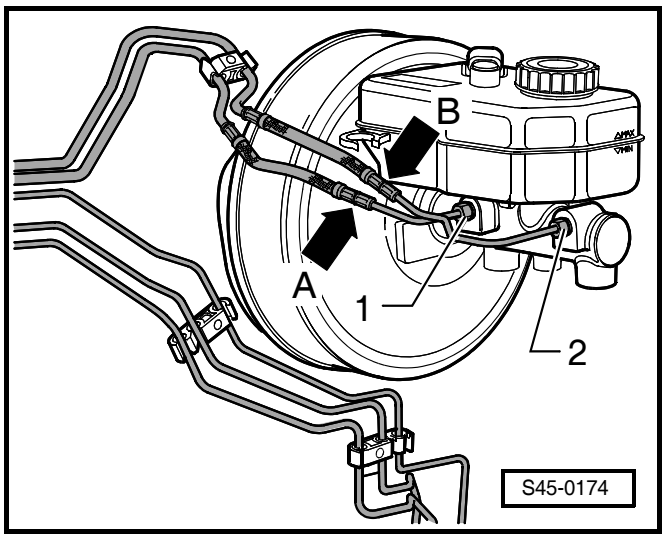
Pos.	Denomination	Connecting points
1	FR	Front right brake caliper
2	RL	Wheel brake cylinder/rear left brake caliper
3	RR	Wheel brake cylinder/rear right brake caliper
4	FL	Front left brake caliper
5	HZ2	Master brake cylinder/floating piston circuit
6	HZ1	Master brake cylinder/push rod piston circuit



Vehicles with ABS//TCS/ESP BOSCH 8.0

Connecting the brake lines to the master brake cylinder ►

Pos.	Denomination	Connecting points
1	HZ1	Master brake cylinder/push rod piston circuit
2	HZ2	Master brake cylinder/floating piston circuit



Note

- *When tightening the pipe screw to the brake line in the area of the crimping -arrow A- counterhold by hand.*
- *When tightening the pipe screw to the brake line in the area of the crimp -arrow B- counterhold by hand.*

Connecting the brake lines to the hydraulic control unit ►

Pos.	Denomination	Connecting points
1	FR	Front right brake caliper
2	RL	Wheel brake cylinder/rear left brake caliper
3	RR	Wheel brake cylinder/rear right brake caliper
4	FL	Front left brake caliper
5	HZ2	Master brake cylinder/floating piston circuit
6	HZ1	Master brake cylinder/push rod piston circuit