Audi A4 1995 ➢

Running Gear Self-diagnosis for ABS, ESP

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List of Workshop Manual Repair GroupsList of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups

Audi A4 1995 ➤

Running Gear Self-diagnosis for ABS, ESP

Repair Group

01 - Self-diagnosis, Electrical check

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

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01 - Self-diagnosis, Electrical check

1 - Self-diagnosis

1.1 - Self-diagnosis

1.2 - Basic notes on self-diagnosis

The control unit of a system with self-diagnosis function detects faults and malfunctions during vehicle operation and stores them in a permanent memory, the contents of which remain intact if the voltage supply from the battery is interrupted.

The self - diagnosis function relates to the electrical and electronic parts of the ABS, i.e. it only registers faults via the electrical connection to the control unit (e.g. speed sensor open circuit).

The self-diagnosis function enables faults to be traced quickly and efficiently. The self-diagnosis options can be utilised with the aid of fault reader V.A.G 1551/1552 or vehicle system tester VAS 5051. To do this the control unit of the system concerned must be able to exchange data with the fault reader. They must communicate with each other.

The diagnostic connector is the interface for communication between the control unit and the fault reader.

To start the fault finding procedure, connect the fault reader to the diagnostic connector. Establish the communication link with the control unit of the system concerned, => Page 1

When the communication link has been established, the required fault finding functions provided by the on-board system you are testing can be selected. These functions are programmed in the form of fixed diagnosis routines. Their use is described in the relevant sections of this Workshop Manual. After first checking the control unit version, start with function 02 "Interrogate fault memory"

Any faults which may be stored in the memory will be indicated on the display of the fault reader. The information displayed can then be used in conjunction with fault tables which enable the cause of the fault to be traced and the necessary repair to be performed quickly and efficiently. The fault tables can be found in the relevant sections of this Workshop Manual.

The self-diagnosis function distinguishes between "static" and "sporadic" faults. If a fault which has been stored in the memory as a "static" fault is no longer present when the ignition is switched on, it is converted into a "sporadic" fault.

Sporadic faults are identified as such. "/SP" appears on the right of the tester display.

A sporadic fault is erased automatically if it no longer occurs over a certain number of driving cycles.

Static faults remain stored in the fault memory until the memory is erased with the fault reader.

If the control unit has to be renewed, first check the control unit version. This appears on the display of the fault reader together with the code when communication is established between control unit and fault reader.

1.3 - Connecting fault reader V.A.G 1551 and selecting address word

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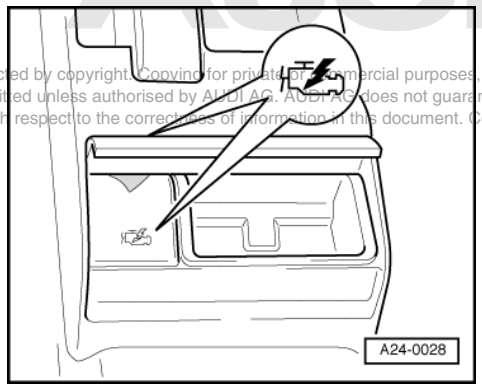
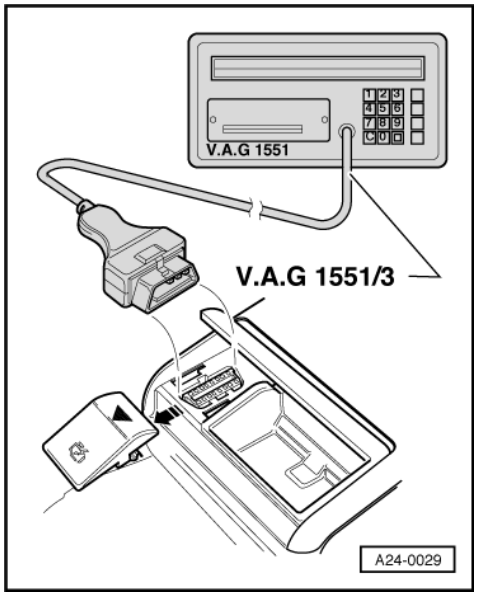


Use can be made of the vehicle diagnostic system tester V.A.G 1552 or the vehicle diagnostic, testing and information system VAS 5051 instead of the fault reader V.A.G 1551. However, with vehicle systems tester V.A.G 1552 there is no option to print out information.

- Observe the test requirements for the system concerned.

- -> Open rear ashtray.



- Remove the cover for the diagnostic connector.
- -> With the ignition off, connect fault reader to diagnostic connector using wire V.A.G 1551/3.

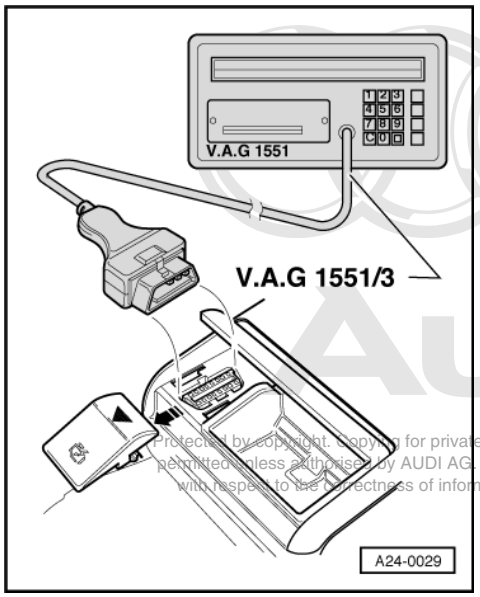
-> Indicated on display:

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

1) displayed alternately

Notes:

- Check the connections of the diagnostic connector if there is no display on the screen.



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

- The PRINT key is used to switch on the printer. When the printer is on the warning lamp in the print key illuminates.
- Depending on the program, additional operating information can be printed out by pressing the HELP key of V.A.G 1551.

- Switch the ignition on.
- Switch on the printer by pressing the Print key on the fault reader.
- Press key -1- for "Rapid data transfer" operating mode.

-> Indicated on display:

```
Rapid data transfer      HELP
Enter address word XX
```

Note:

The address word selects the control unit of the on-board system that you wish to test with the fault reader. The address word is made up of two digits, which are given in the relevant sections of this Workshop Manual.

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For example: Press keys 03 to enter the address word for "Brake electronics".

-> Indicated on display:

```
Rapid data transfer      Q
03 - Brake electronics
```

- Confirm input with Q key.

-> Display after address word 03 has been entered:

```
Rapid data transfer
Tester sends address word 03
```

Note:

If a fault occurs in the communication link between fault reader V.A.G 1551 and the control unit, one of the following four displays will appear.

```
K-wire not switching to earth/positive
     HELP
```

Press the HELP key to obtain a printout of the possible causes of fault.

```
No signal from control unit
```

Check diagnostic wiring ("K" wire).

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

- Check voltage supply and earth connection to control unit -J104.

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

-> If this display appears:

```
Communication problem
```

- Rectify fault

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

- After rectifying possible causes of fault, enter address word 03 for brake electronics once again and confirm with Q.

-> If communication between fault reader and control unit has been established and is functioning properly, display indicates control unit -identification (X), system designation (Y), hardware and software version (Z), coding (V) and workshop code (W).

```
XXX XXX XXX     YYY YYY YY YY YY
ZZZ
Coding VVVVV     WSC WWWWW
```

Notes:

- The ⇒ key is used for the continuation of the program sequence.
- The various on-board systems to be tested are described in more detail in the relevant sections of this Workshop Manual.
- The control unit index can only be changed by fitting a new control unit

=> Replacement Parts Catalogue

- If the control unit identification number does not appear in the display then check the diagnostic wiring.

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

- Press ⇒key.

-> Indicated on display:

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

1.4 - Selecting functions

Diagnostic communication established. Control unit version is checked and ⇒ key is pressed.

-> Indicated on display:
(Function selection, e.g. 02 - interrogate fault memory)

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

You can now select one of the functions listed below. Start the fault-finding routine with function 02 "Interrogate fault memory".

01 -	Interrogating control unit version
02 -	Interrogating fault memory
03 -	Final control diagnosis
04 -	Starting basic setting
05 -	Erase fault memory
06 -	End of output
07 -	Encoding control unit
08 -	Reading measured value block
10 -	Adaption
11 -	Log-in procedure

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The functions "Erase fault memory" and "End output" are described on the following pages.

The other functions listed here are described in the relevant sections of this Workshop Manual.

Once a function has been implemented and completed press the ⇒key to return to "Select function" at the start of the fault-finding routine.

Erase fault memory

Preconditions:

- Fault memory was interrogated.

- Press ⇒key.

-> Indicated on display:

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

- Press keys 0 and 5 for the function "Erase fault memory".

-> Indicated on display:

```
Rapid data transfer      Q
05 - Erase fault memory
```

- Confirm input with Q key.

-> Indicated on display:

```
Rapid data transfer
Fault memory is erased
```

- Press ⇒key.

-> Indicated on display:

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

Notes:

```
Important
Fault memory has not been interrogated
```

-> This message indicates an error in the test sequence.

- Keep exactly to the test sequence. First interrogate fault memory, then erase fault memory in the same diagnosis cycle.

End of output

-> Indicated on display:

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

- Press keys 0 and 6 for the function "End output".

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-> Indicated on display:

```
Rapid data transfer      Q
06 - End output
```

- Confirm input with Q key.

-> Indicated on display:

```
Rapid data transfer     HELP
Enter address word XX
```

- Switch ignition off.
- Disconnect fault reader.

1.5 - Safety measures and basic rules for fault finding

- The ABS/EDL/TCS and ESP are systems that affect the safety of the vehicle. Work on these systems must only be carried out by qualified personnel.

1.6 - Fault remedy

If a fault is present, pin-pointed fault finding must be carried out:

- First switch on the ignition and observe illumination of the warning lamps. The table in chapter "Overview of warning lamp functions" for the relevant system enables an initial determination.
- Determine test preconditions.
- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03
- Check the control unit version => spare parts catalogue and press the ⇒ key.

- Interrogate fault memory. If a fault is stored: Make a note of the fault and erase fault memory => Page 5 .
- Complete data transfer with the function "End output" => Page 5 .
- Repair fault according to fault table. Reselect "Brake Electronics" with address word 03. Interrogate and erase fault memory.
- Complete data transfer with the function "End output". Disconnect fault reader V.A.G 1551.

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- Check that the connectors are plugged in and locked. Perform a road test. The warning lamps must not light up during the test drive. If the warning lamps light up during the test drive the fault finding must be carried out again.

Note:

If the plug is disconnected from the control unit during the drive there is danger of an unfounded fault entry into the fault memory of another control unit. The function of the brake system will be impaired. As the brake pressure is no longer controlled by the electronic brake force distribution the rear wheels tend to break excessively. Due to this the rear of the vehicle may break away unexpectedly. This could cause an accident if the vehicle is driven.

- Switch off the ignition before removing and installing components.

- If a component is indicated as being defective, only renew it if you are sure that the electrical wiring for that component is in proper condition. The wiring must be able to transmit the necessary signals without interference or resistance. Check the wiring for:
  - Corrosion and loose contacts in the connectors and earth connections. If any of the plug contacts are bent, broken or corroded, use the wiring harness repair kit VAS 1978 to fit new contacts
  - Open circuits
  - Short circuits to earth or to positive

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

1.7 - Test prerequisites

- The diagnosis procedure can only be started with the vehicle stationary and the ignition switched on (or with engine running). The diagnosis cannot be started if wheel speed exceeds 2.75 km/h.
- Supply voltage OK (at least 10.0 V).
- Connector at control unit -J104 correctly plugged in (retainer is clipped in).
- Wheel speed sensors must be installed correctly

=> Brake System; Repair group 45

- Permissible and identical wheels and tyre size Correct tyre pressure at all wheels.
- Mechanical and hydraulic parts of the brake system are OK: Hydraulic connections and pipes are not leaking (visual check of hydraulic unit, brake calipers, wheel brake cylinder, tandem brake master cylinder).

- Wheel bearings and wheel bearing play OK.
- While testing the system, ensure that the vehicle's electrics are not subjected to electromagnetic interference, i.e. keep the vehicle away from equipment with a high current draw, such as electric welding units.

Important
Diagnosis is not terminated at a speed v = > 20 km/h. Risk of accident.

1.8 - Technical publications required

- Applicable current flow diagram

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

- Fitting locations of electrical components

=> Brake System; Repair group 45

- Brakes, brake mechanics

=> Brake System; Repair group 46

- Brakes, brake hydraulics

=> Brake System; Repair group 47

- Notes on elimination of current faults

=> Technical Service Handbook

1.9 - Road test

- Certain faults are only detected by the self-diagnosis when the vehicle is moving. The system can be tested by carrying out a test drive. Maintain a speed above 60km/h for a period of 30 seconds. Observe the traffic conditions and perform a braking controlled by the ABS. The control can be felt by a pulsing sensation at the brake pedal.

Important
If the vehicle is driven after a fault has been detected there is danger of an accident. The function of the brake system will be impaired. As the brake pressure is no longer controlled by the electronic brake force distribution the rear wheels tend to break excessively. Due to this the rear of the vehicle may break away unexpectedly. If test and measuring instruments are required during a test drive, these must always be secured to the rear seat and operated by a second person from this position. If test equipment were operated from the front passenger seat, the person sitting there could be injured if the front passenger airbag were triggered in the event of an accident.

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2 - CAN bus

2.1 - CAN bus

2.2 - Function of CAN-Bus

Bus:

"Bus" is used to describe a system that transports and distributes data.

CAN:

Controller Area Network refers to a bus system employing two lines known as bus lines. These bus lines are used for serial transmission of data, i.e. data is sent to each of the connected control units in turn.

Further details and test instructions can be found on => Page 8 . Two wires are employed in order to be able to detect faults in the wires themselves.

The data bus termination is a resistance. It prevents the data transmitted by the terminals returning as an echo and corrupting the data.

The terminating resistors of the CAN Bus have a rating of 120 ωand are located in control unit -J104 -Item 2- and in the engine control unit -Item 3-. They produce a total terminating resistance of approx. 60 ω.

Steering angle sender -G85 transfers its data to the control unit via the CAN-Bus. It has no terminating resistor.

With the introduction of control units 8D0 907 389 D, the CAN bus is connected centrally in the engine control unit with a resistance of approx. 66 ω. All other control units linked to the CAN network, e.g. ESP control unit -J104, are then connected with a high resistance of 2.6 kω.

2.3 - Test the CAN bus system

It was advised in the fault table to check the bus:

- By referring to the appropriate current flow diagram, check how many control units are connected to the CAN bus.
- Check that the multi-pin connectors on the control units are properly seated.
- Connect fault reader V.A.G 1551 or V.A.G 1552 and press key 0 twice to select the function "Automatic test sequence"

  Ensure that there is no function fault in any of the connected control units before examining the bus lines.

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A function fault refers to a fault that does not directly affect the bus system but affects the functionality of a system in some other way. For example, this may be a defective sensor. The result is that the sensor signal cannot be prepared for transferring on the bus system. A functional fault of this nature has a direct effect on the bus system. Communication with the other control units that require the sensor signal concerned is affected.

Is there a function fault?

Repair it first.

- Make a note of the faults and erase fault memory of all control units => Page 5 .
- Press keys 0 and 6 for the "End output" function and press the Q key to confirm entry.
- End output of fault reader with the function "End output" => Page 5 .
- Rectify the faults as described in the fault table in the relevant Workshop Manual.

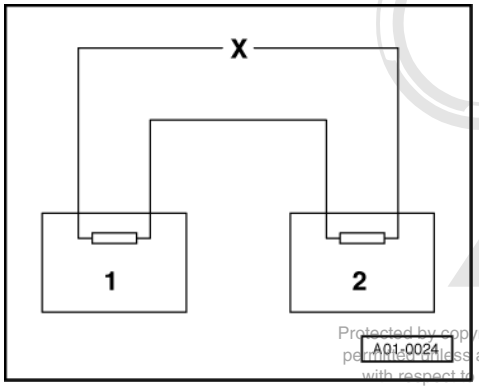
All function faults have been rectified.

- If the communication between the control units is still interrupted the bus lines must be examined.

There are two different cases when looking for faults in the bus lines:

- Two control units communicate via a "Two-line bus system".
- Three or more control units communicate via a "Two-line bus system".

The communication between two control units is carried out via a "Two-line bus system".



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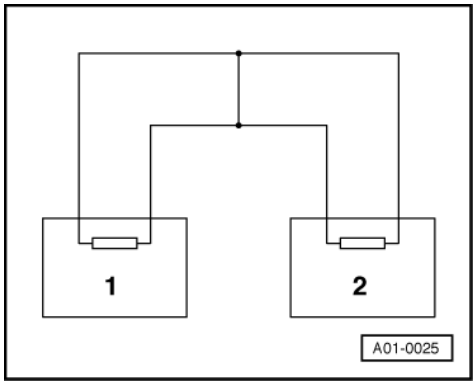
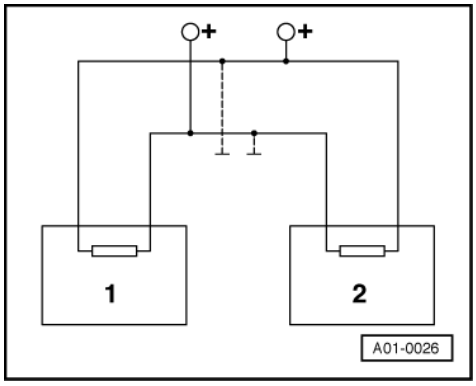
- Switch ignition off.
- -> Disconnect the two control units.
- Investigate whether one of the bus lines has an open circuit.

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



- -> Check whether there is a short circuit between the bus lines.

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



- -> Check whether there is a short to positive or earth in one of the bus lines.

No fault can be detected at the bus lines.

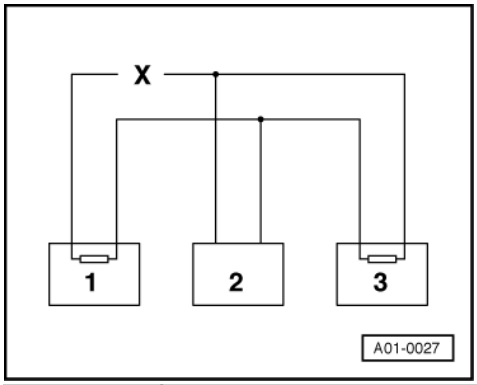
- As a test, replace the control unit which can be exchanged with the least effort in terms of time and cost.
- If the communication between the control units via the bus is still faulty exchange the second control unit.

The communication between three or more control units is carried out over a "two-line bus system".

- Evaluate the faults stored in the control units.

Example 1:

The faults stored in the fault memories indicate that the control unit 1 does not communicate with control units 2 and 3.



Control unit	Faults stored in fault memory
1	- Missing message from control unit 2 - Missing message from control unit 3
2	- Missing message from control unit 1
3	- Missing message from control unit 1

- Switch ignition off.
- Disconnect the control units connected to each other via the bus lines and investigate whether there is a short circuit between the bus lines.

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

- If no fault can be detected in the bus lines, replace control unit 1.

Example 2:

The faults stored in the fault memories indicate that the control unit 2 does not communicate with control units 1 and 3.

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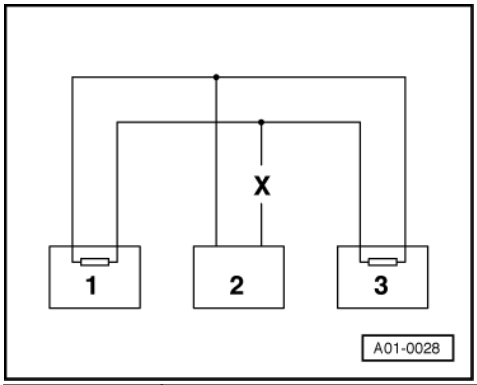


Control unit	Faults stored in fault memory
1	- Missing message from control unit 2

Control unit	Faults stored in fault memory
2	- Missing message from control unit 1 - Missing message from control unit 3
3	- Missing message from control unit 2

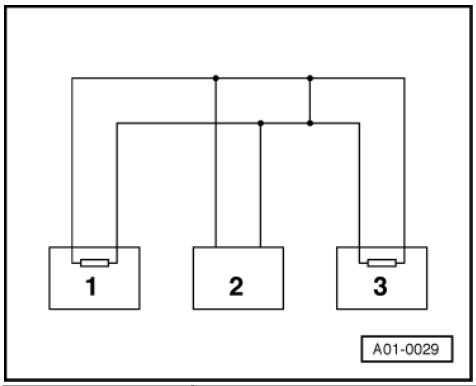
- Switch ignition off.
- Disconnect the control units connected to each other via the bus lines and investigate whether there is a short circuit between the bus lines.

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

- If no fault can be detected in the bus lines, replace control unit 2.

Example 3:

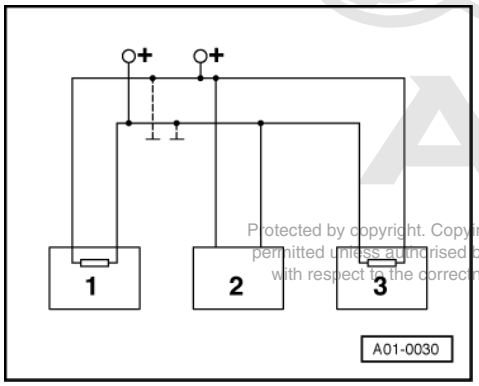
The faults stored in the fault memories indicate that sending or receiving is not possible in any of the control units.



Control unit	Faults stored in fault memory
1	- Hardware defective
2	- Hardware defective
3	- Hardware defective

- Switch ignition off.
- -> Disconnect the control units that are linked by the bus wires and check for a short circuit between the bus wires

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



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- -> Check the bus wires for short to positive and short to earth.

If the reason for "Hardware defective" cannot be established in the bus wires, check whether one of the control units is responsible for the fault.

All the control units that communicate via the CAN data bus are still disconnected. The ignition is switched off.

- Connect one of the control units.

- Connect fault reader V.A.G 1551 or V.A.G 1552. Switch the ignition on and erase the fault memory of the control unit that has just been connected Terminate fault readout by selecting function 06 "End output".
- Switch the ignition off and then on again.
- Leave the ignition switched on for 10 seconds. Then interrogate the fault memory of the control unit that has just been connected, using the fault reader.
- If the "Hardware defective" is indicated, replace the control unit that has just been connected.
- If the "Hardware defective" fault is not indicated, connect the next control unit and repeat the above procedure.

3 - System Description

3.1 - System Description

The individual elements of the system are as follows:

3.2 - ABS

Anti-lock brake system

The anti-lock brake system (ABS) prevents the wheels from locking when the brakes are applied by the driver. Directional stability and steerability are maintained in spite of high braking effect.

3.3 - EDL

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Electronic differential lock

The electronic differential lock (EDL) is an aid when driving away from a standstill. An electronically controlled brake application on the spinning driven wheel provides a torque reaction point for the differential. This enables the wheel with better traction to make use of the engine power. This also applies when reversing.

EDL is standard equipment on vehicles with 4WD. While EDL acts on all four wheels in vehicle with 4WD on vehicles with FWD it acts only on the front wheels. A mechanical differential lock is not required.

The EDL control function can be initiated at road speeds up to 40 km/h. Once EDL has been activated it cuts out automatically at a predetermined upper speed threshold of 40 km/h on vehicles with FWD and 80 km/h on vehicles with four wheel drive.

Suction dampers are fitted in the hydraulic unit. They assist the build-up of pressure in the corresponding wheel brake cylinders when EDL is active. The operating range of the pressure limiting valve in the hydraulic unit is 170 ± 25 bar.

To stop the brakes overheating the EDL control function is suppressed if the temperature of the brakes exceeds a certain value. The temperature value is defined in control unit-J104. The temperature of the brakes is calculated by the control unit using a simulation formula. The EDL is then reactivated if the calculated temperature drops below a predetermined lower threshold. The operation of the brake system and the ABS function are not affected by this automatic cut-off feature.

When the ignition is switched off, the calculated temperature of the hot brakes is stored in the memory until the ignition is switched on again. When the ignition is switched on, the dash panel insert sends a time signal which enables the control unit -J104 to calculate the period the vehicle has been left standing. This period is put into the temperature simulation formula to calculate the new temperature of the brakes. If the vehicle has been left standing for more than one hour, the control unit will automatically assume a brake temperature equal to the lowest value in the simulation formula.

If EDL is switched off due to temperature limit being exceeded this is indicated in measured value block for a period of 20 ignition cycles.

3.4 - TCS

Traction control system

TCS (traction control system) is fitted only on vehicles with front-wheel drive: In these vehiclesobserve control unit coding. The traction control function requires an exchange of signals between control unit -J104, the engine control unit and the gearbox control unit. The control units communicated with each other.

Two communications systems are in use:
- Data transfer takes place on several individual wires.
- Data transfer is by way of the CAN bus. The CAN bus employs only two wires These are capable of transmitting all the necessary data.

To find out which communications system is being used for data transfer, interrogate the control unit version, and read out the table of control unit versions.

The TCS traction control system prevents the driven wheels from spinning under acceleration: The system operates by reducing engine torque and is active at all speeds. The EDL and TCS functions act together to assist acceleration.

If required, the TCS function can be switched off (and on again) by means of the TCS switch in the centre console. The TCS will be reactivated automatically the next time the ignition is switched on. The TCS warning lamp in the dash panel insert lights up when the TCS switch is pressed. The warning lamp flashes at rate of three times per second when the control function starts working.

3.5 - EBPD

Electronic brake pressure distribution

The control unit -J104 is programmed with specially designed software for electronic brake pressure distribution which assumes the function of the brake pressure regulator.

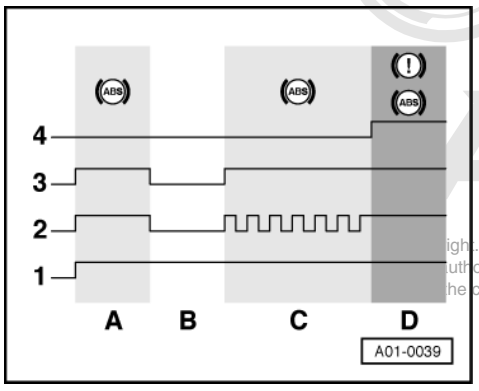
Bosch 5.0 and Bosch 5.3 without EPBD emergency running

A fault occurring in the ABS entails failure of the EPBD. This is indicated by lighting up of the ABS/EDL warning lamp -K47 and the red symbol "Brake system fault". The vehicle must then only be moved to a very limited extent.

Bosch 5.3 with EPBD emergency running and ESP 5.3

If the ABS fails, only the ABS/EDL warning lamp -K47 lights up. The EPBD function is maintained by specially co-ordinated software.

If it is not possible to maintain the EPBD function, the red symbol "Brake system fault" also lights up. The vehicle must then only be moved to a very limited extent.



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1 - -> Terminal 15
2 - Signal for actuation of ABS/EDL warning lamp and red brake fault symbol.
3 - Voltage supply for the ABS/EDL warning lamp.
4 - Voltage supply for red brake fault symbol.

A - During a phase "A" (after ignition is switched on) ABS/EDL warning lamp is actuated for two seconds during self test by means of signal "2" and comes on. During this phase an internal function in the dash panel insert suppresses the activation of the red brake fault symbol.

B - Signal "2" is not present during phase "B". The ABS/EDL warning lamp and red brake fault symbol do not light up.

C - In phase "C" self-diagnosis has detected a fault which does not cause electronic brake pressure distribution function to be deactivated. Signal "2" is pulsed. Only the ABS/EDL warning lamps illuminates

D - In phase "D" self-diagnosis has detected a fault which causes electronic brake pressure distribution function to be deactivated. Signal "2" is present continuously. Both the ABS/EDL warning lamp and the red brake fault symbol light up.

3.6 - ESP

Electronic Stability Program (ESP)

The ESP is a further additional expansion stage of the familiar driving safety systems ABS/EDL and ABS/EDL/ TCS.

ESP enhances the degree of control in critical dynamic conditions, i.e. when the driver approaches the handling limits of the vehicle. In comparison to other familiar driving safety systems it decreases the danger of spinning and improves the steerability.

However, ESP is not able to overcome the physical limits of the available road adhesion.

ESP, the Electronic Stability Program is a Drive Dynamics Control, DDC for short. These stabilise the vehicle during over and understeering. The functions of electronic brake pressure distribution, ABS, EDL and TCS are incorporated by the control system. However, the characteristic function of the ESP is controlled brake application at individual wheels.

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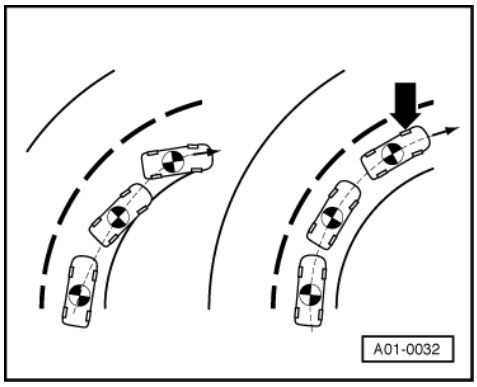
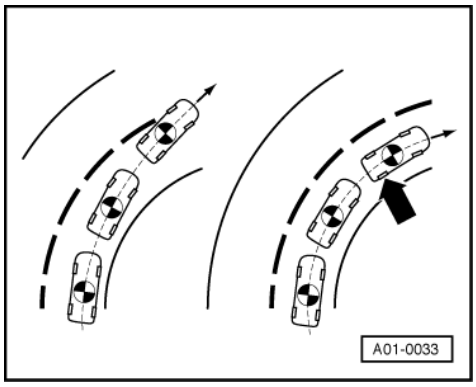
If required, the TCS and ESP control functions can be switched off and then on again by means of the TCS/ ESP switch in the centre console. This switch is overridden when the driver presses the brake pedal: ESP will remain active at all times during braking. Both functions, TCS and ESP, will be reactivated automatically the next time the ignition is switched on.

When the system is deactivated, the TCS/ESP warning lamp illuminates in the dash panel. The warning lamp flashes at rate of three times per second when the control function starts working.



Examples:

-> During oversteer the rear of the vehicle breaks out. The vehicle does not rotate far enough about its vertical axis to maintain course through the corner. The system counteracts this excessive movement by applying a controlled braking force at the outside front wheel.

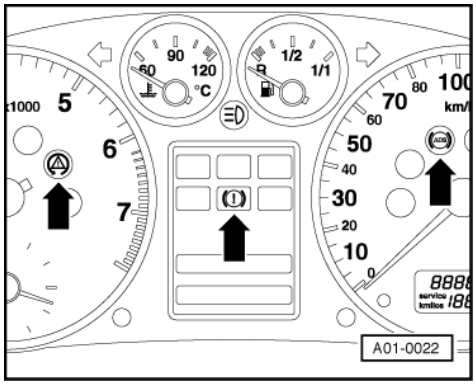


-> During understeer the front end of the vehicle does not follow the required corner radius. It breaks away towards the outside of the bend. The vehicle does not rotate far enough about its vertical axis to maintain course through the corner. The system increases the amount of rotation by applying a controlled braking force at the inside rear wheel.

4 - ABS/EDL/TCS Bosch 5.0

4.1 - ABS/EDL/TCS Bosch 5.0

4.2 - Table of warning lamp functions



- If the self-diagnosis function detects a fault in the system, this will be indicated (with ignition on) by the warning lamps in the dash panel insert. The warning lamps are located in the dash panel insert.

-> Dash panel insert without FIS

- The diagram shows the warning lamps for ABS/EDL -K47 (right arrow), brake system warning lamp -K118 (centre arrow, red brake fault symbol) and TCS warning lamp -K86 (left arrow).

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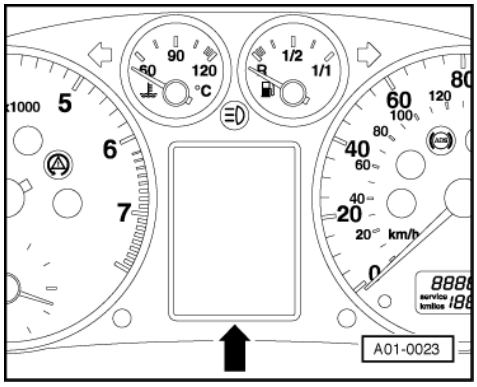
-> Dash panel insert with FIS



- The warning lamp -K118 is not supplied with FIS. The red brake fault symbol appears in the display.
- If the brake system is not fully functional, but the ABS/EDL warning lamp -K47 and the red brake fault symbol do not light up, this means the fault must be sought in the conventional braking system (mechanical/hydraulic components)

=> Brake System; Repair group 46

=> Brake System; Repair group 47

ABS -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
			If an irregularity occurs in the self test after switching on the ignition and the warning lamps -K47 and -K86 do not light for 2 seconds test the warning lamps; => Perform "Electrical check" Page 23 , Test steps 19 and 21. Failure to light may be due to the following: - Inadequate battery voltage. None of the warning lamps in the dash panel insert light. Check the battery. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder => Electrical System; Repair group 90; Dash panel insert Dash panel insert
		X 1)	- The ABS warning lamp does not light up during the self-test phase: Short to earth in wiring from contact 32 of control unit -J104 to dash panel insert (actuation of ABS warning lamp). This fault does not affect the actuation of the TCS warning lamp. TCS warning lamp lights during self test on vehicles fitted with traction control system (TCS) => Perform "Electrical check", Page 23 , Test step 19.
X			- The vehicle is equipped with traction control system (TCS). The ABS warning lamp lights up during the self-test phase: TCS warning lamp does not light during self test => Perform "Electrical check", Page 23 , Test step 21.

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

ABS -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
X		X 1)	- If the voltage supply and the actuation of the warning lamps are OK, the warning lamps will light up for 2 seconds during the self test phase after the ignition is switched on. - Applies to vehicles with or without traction control system (TCS): Red brake fault symbol does not light. Perform "Electrical check", Page 23 , Test step 20 and pay attention to items listed in next example.

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

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ABS -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
X	X	X 1)	The vehicle is with or without TCS. If the ABS/EDL warning lamp illuminates continuously after the ignition is switched on, and the red brake fault symbol also illuminates 3 seconds after the ignition is switched on: Important There is a risk of accident if the vehicle is driven in this condition. The function of the brake system will be impaired. As the brake pressure is no longer controlled by the electronic brake force distribution the rear wheels tend to break excessively. Due to this the rear of the vehicle may break away unexpectedly. The fault may be caused by the following conditions: - Voltage supply between 6.5 and 10.5 V and vehicle speed greater than 6 km/h; => Perform "Electrical check", Page 37 . - Fault reader V.A.G 1551 is connected and the diagnostic link has been established with control unit -J104. - In vehicles with automatic gearbox and "high-line" dash panel insert, the red brake fault symbol does not appear immediately after the ignition is switched on. The driver instruction "Apply foot brake when selecting gear with vehicle stationary" is given priority. Operate the foot brake and engage a gear. If the actuation of the red brake fault symbol is OK, the symbol will now light up.

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

ABS -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
		X 1)	The vehicle is equipped with traction control system (TCS). - A fault exists which affects only the TCS. The ABS and EDL systems are not switched off. Interrogate fault memory => Page 23 , Test steps 21 and 22. - TCS in controlled operation. Warning lamp for TCS flashes 3 times per second. - Short to positive in TCS switch: The TCS warning lamp will extinguish 5 minutes after the ignition is switched on. - The warning lamp illuminates continuously after the ignition is switched on, and none of the faults listed in this section of the table are present. Short to earth in wiring from contact 31 of control unit -J104 to dash panel insert (actuation of TCS warning lamp).
			There is a problem. The warning lamps light during the self test and then extinguish normally. Failure to light may be due to the following: - "Brake light switch" F fault (fault code 00526) stored in fault memory; Interrogate fault memory => Page 37 . - The EDL has been temporarily deactivated in order to prevent the brakes from overheating.

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

ABS -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
X	X		The vehicle is with or without TCS. No faults are stored in the fault memory. If the ABS warning lamp lights up continuously after the ignition is switched on, and the red brake fault symbol also lights up 3 seconds after the ignition is switched on: TCS warning lamp does not light even on vehicles with TCS. Important There is a risk of accident if the vehicle is driven in this condition. The function of the brake system will be impaired. As the brake pressure is no longer controlled by the electronic brake force distribution the rear wheels tend to break excessively. Due to this the rear of the vehicle may break away unexpectedly. - Control unit voltage supply less than 6.5 V; => Perform "Electrical check", Page 23 , Test step 19.

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ABS -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
	X		No faults are stored in the fault memory. The red brake fault symbol lights up continuously after the ignition is switched on. - Brake fluid level too low - Fault in dash panel insert: Perform "Electrical check", Page 23 , Test step 20.

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

4.3 - Interrogating control unit version

- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03 => Page 1
- Go back to the initial settings of the program by pressing the ⇒ key:

-> Indicated on display:

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

- Press keys 0 and 1 for the function "Interrogate control unit version" and confirm entry with Q key.

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Note:

- The control unit version can only be altered by fitting a new control unit.
- Refer also to spare parts list for assignment of control unit -J104.

-> Indicated on display:

```
4D0 907 379 1)     2)     3)
Coding 00000     WSCXXXXX
```

The coding is only shown on vehicles with traction control system (ASR).

The workshop code, WSC XXXXX, identifies the workshop which performed the last coding of the control unit.

1) Control unit index

2) System designation

3) Hardware and software status

Control unit versions

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
FWD; ABS, Bosch 5.0	1AC	4D0 907 379	D	Not encodable	Separate wires	
FWD; ABS, Bosch 5.0	1AH	4D0 907 379	G	Not encodable	Separate wires	EDL suction-side control; control unit with rough-road information for On-Board Diagnostics (USA)
FWD; ABS/EDL/ TCS, Bosch 5.0	1AJ	4D0 907 379	M	Encodable Page => 19	Separate wires	EDL suction-side control

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
		4D0 907 379	N	Encodable Page => 19	Separate wires	EDL suction-side control

1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
4WD; ABS/EDL Bosch 5.0	1AH	4D0 907 379	J	Not encodable	Separate wires	EDL pressure-side control; control unit with wheel speed sensor outputs for automatic gearbox and rough-road information for On Board Diagnostics
		4D0 907 379	F	Not encodable	Separate wires	EDL pressure-side control
		4D0 907 379	K	Not encodable	Separate wires	EDL suction-side control
		4D0 907 379	L	Not encodable	Separate wires	EDL suction-side control; control unit with wheel speed sensor outputs for automatic gearbox and rough-road information for On Board Diagnostics

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1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

- Press ⇒key.

-> Indicated on display:

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

4.4 - Encoding control unit

If a control unit with traction control function (TCS) is replaced, or if the following fault is stored in the fault memory of the control unit....

- "ABS/EDL/gearbox - electrical connection"

The control unit must be coded according to the type of engine and gearbox.

Note:

- The coding can only be performed if a workshop code is stored in V.A.G 1551

=> Operating instructions V.A.G 1551

- The ABS/EDL/TCS control unit with index "N" was additionally introduced as of 05.95 together with automatic gearbox 01V for vehicles with TCS traction control. Alternative control unit codes for automatic gearbox 01V were added accordingly.
- Control units with index "N" supplied as replacement parts can be used to replace previous control units with index "M".

- Control units with index "M" will no longer be supplied as replacement parts for vehicles prior to 05.95 once existing stocks have been used up.

- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03 => Page 1 .
- Check the control unit version => Page 18 and press the ⇒ key.

Notes:

- During control unit identification a 3 or 5-digit code must always be displayed.
- The control unit must coded as follows if the display does not show the correct code for the vehicle or if a new control unit has been fitted.

-> Indicated on display:

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

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- Press keys 0 and 7 for "Coding control unit" function.

-> Indicated on display:

```
Rapid data transfer      Q
07 - Coding control unit
```

- Confirm input with Q key.

-> Indicated on display:

```
Code control unit     Q
Enter code number      XXXX
```

- Enter the required code number and confirm with Q key.

Encoding table

Engine	Gearbox	Data transfer via:	Control unit part number with index		Code no.	Note:
2.6 l. 6-cyl. 2V	Manual gearbox 012	Separate wires	4D0 907 379	M; N	00000	Contact 45 on control unit - J104 not used.
	Automatic gearbox 01V	Separate wires	4D0 907 379	N	00003	12 V applied to contact 45 on control unit - J104.
2.8 l. 6-cyl. 2V	Manual gearbox 012	Separate wires	4D0 907 379	M; N	00000	Contact 45 on control unit - J104 not used.
	Automatic gearbox 01V	Separate wires	4D0 907 379	N	00003	12 V applied to contact 45 on control unit - J104.

Engine	Gearbox	Data transfer via:	Control unit part number with index		Code no.	Note:
2.8 l. 6-cyl. 5V	Manual gearbox 012	Separate wires	4D0 907 379	N	00000	Contact 45 on control unit - J104 not used.
	Automatic gearbox 01V	Separate wires	4D0 907 379	N	00003	12 V applied to contact 45 on control unit - J104.

-> The display shows the control unit identification and the code entered (e.g. 00000).

```
4D0 907 379 X System des.      Software
stat.
Coding 00000     WSCXXXXX
```

- Press ⇒key.

-> Indicated on display:

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

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- Press keys 0 and 6 for the "End output" function and press the Q key to confirm entry.

4.5 - Reading measured value block

The control unit can transfer measured values to the fault reader V.A.G 1551. This test data delivers information about the condition of the system and the sensors connected. In many cases the transferred test data can be used to support the fault finding and remedy. The measured values available from the Bosch type 5.0 system are grouped in three display groups, which can be called up via display group numbers.

- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03 => Page 1 .

Notes:

- When the printer is switched on, the contents of the display will be printed out on the fault reader log.
- When "Read measured value block", also check wiring and connectors for loose contacts.

- Check the control unit version => Page 18 and press the ⇒ key.

-> Indicated on display:

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

- Press keys 0 and 8 for "Read measured value block" function.

-> Indicated on display:

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

- Confirm input with Q key.

-> Indicated on display:

```
Read measured value block       Help
Enter display group number      XXX
```

- Press keys 0, 0 and 1.
- Confirm input with Q key.

Test table, display group 1

- The display zones 1 to 4 show the actual wheel speeds at the tyre circumference in km/h. These are calculated by control unit -J104 on the basis of the pulses received from the wheel speed sensors. If one of the display zones shows no reading, proceed as for fault codes 00283, 00285, 00287, 00290 "Speed sensor". Fault table => Page 37 .
- In order to check that the speed sensor signals are correctly assigned to the four wheels, the vehicle must be raised. On vehicles with manual gearbox put the gear lever in neutral. On vehicles with automatic gearbox move the selector lever to position "N". Turn appropriate wheel by hand. The other wheels must be prevented from rotating.
- When the vehicle is accelerated uniformly on a dry surface, the displayed values will increase continuously in rising whole numbers, e.g. 6km/h, 7km/h, 8 km/h.... The difference between displayed values 1 to 4 should be no more than ±1 km/h(rounding errors).If the values jump, for instance from... 6km/h, 7km/h, to 12 km/

h... or if the difference between the displayed values is greater than ±1 km/h then check the installation of the wheel speed sensors and rotors.

=> FWD and 4WD Running Gear; Repair group 40

=> FWD and 4WD Running Gear; Repair group 42

Reading measured value block			1 ⇒	◂ Indicated on display
1 ... 19 1) km/h	1 ... 19 1) km/h	1 ... 19 1) km/h	1 ... 19 1) km/h	
			Wheel speed, rear right	
		Wheel speed, rear left		
	Wheel speed, front right			
Wheel speed, front left				

1) Control unit -J104 terminates self-diagnosis if speed exceeds 19 km/h.

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551 or arrow keys ↑ and ↓ on V.A.G 1552.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

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- Press keys 0, 0 and 2.
- Confirm input with Q key.

Test table, display group 2

Reading measured value block			2 ⇒	◂ Indicated on display
0 or 1	0 or 1	0 or 1	0 or 1	
			Solenoid valve relay: On vehicles with FWD this display is shifted one zone to the left. - 0 ⇒ Not permissible during "Read measured value block" function; relay not actuated when ignition switched on. Perform "Electrical check" =>Page 23 , Test step 11. - 1 ⇒ Specified value; relay actuated by control unit -J104 when ignition is switched on.	
		Voltage at return pump motor: On vehicles with FWD this display is shifted one zone to the left. - 0 ⇒ Specified value, no voltage applied to return pump motor. - 1 ⇒Not permissible during "Read measured value block" function; voltage applied to return pump motor. Perform "Electrical check" =>Page 23 , Test step 12.		
	Brake light switch: additional signal for 4WD models only: - 0 ⇒ Brake pedal not operated - 1 ⇒ Brake pedal operated			Check brake light switch in the event of deviation. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations

Brake light switch: Signal for FWD and 4WD: - 0 ⇒ Brake pedal not operated - 1 ⇒ Brake pedal operated	Check the brake light switch in the event of deviation. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551 or arrow keys ↑ and ↓ on V.A.G 1552.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

Note for display group 3:

If display zones for engine speed and actual engine torque are to be read out with engine running communication between fault reader and control unit must be terminated with "End output" function => Page 5 . Then start engine and set up diagnostic link between fault reader and control unit again.

- Press keys 0 and 8 for "Read measured value block" function.
- Confirm input with Q key.
- Press keys 0, 0 and 3.
- Confirm input with Q key.

Test table, display group 3

Reading measured value block			3 ⇒	◂ Indicated on display
60 ... 8000 rpm	0 ... 100 %	0 or 1	---	

TCS switch: (only on vehicles with traction control system (TCS/TCS):
- 0 ⇒ TCS switch not activated.
- 1 ⇒TCS switch actuated; system status switches from "TCS OFF" to "TCS ON" or vice versa.
- The TCS warning lamp will light up if the TCS is switched off with the TCS switch.

Check TCS switch in the event of deviation. "Electrical check" => Page 23 , Test step 22.

Actual engine torque (MMI): (only on vehicles with traction control system (TCS/TCS):
- 0% ⇒Vehicle in overrun phase.
- 20% - 30% ⇒equivalent to engine idling.
- 100% ⇒ Engine delivering maximum torque.

If no display appears, proceed as described for fault code 00647 "ABS-TCS/engine electrical connection 2": Fault table => Page 37 .

Engine speed: (only on vehicles with traction control system (TCS/TCS):
- The display indicates engine speed in steps of 60 rpm, starting at 60 rpm.

If no display appears, proceed in line with fault 00529 "Speed information missing, no signal". Fault table => Page 37 .

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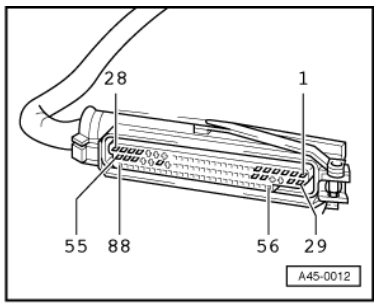
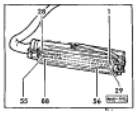
4.6 - Electrical check

- For vehicles for which the self - diagnosis does not give any indication of the source of the fault the complete electrical check must be worked through.
- In vehicles in which the self- diagnosis provides a direct indication of the source of the fault only perform the test steps recommended in the fault table (specific testing).

Test requirements

- An "Automatic test sequence" must first be performed to establish that any faults present in the gearbox and engine control units can only originate from the ABS.
  - Connect fault reader V.A.G 1551 and select address word 00 with ignition switched on.
  - After completing the "Electrical check", interrogate and erase the fault memories of the gearbox and engine control units.





- **-> Ensure multiple connector between wiring harness and control unit -J104 is in perfect condition, i.e. not bent, broken or corroded contacts. Replace any damaged contacts using wiring harness repair kit VAS 1978.**

Note:

The instructions supplied with wiring harness repair kit VAS 1978 normally do not permit repairs to the wiring of the ABS and its associated systems. However, this only applies to the screened wiring in the systems.

- Switch ignition and electrical consumers off before commencing the check (headlights, lighting, fan, etc.).
- For test steps 13 to 16 the vehicle must be raised so that the wheels can turn freely. On vehicles with manual gearbox put the gear lever in neutral. On vehicles with automatic gearbox move the selector lever to position "N".

The following equipment is required:

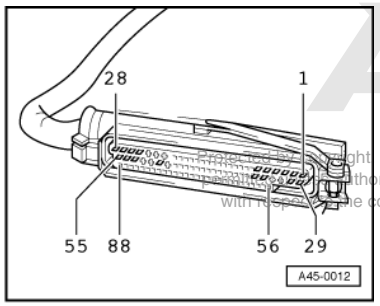
- Test box V.A.G 1598/20
- Adapter cable set V.A.G 1594
- Hand-held multimeter V.A.G 1526
- Pressure gauge V.A.G 1310 A

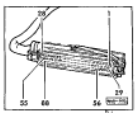
Connecting test box V.A.G 1598/20 and checking ABS, ABS/EDL and TCS systems

- Switch ignition off.
- Remove control unit-J104

=> FWD and 4WD Running Gear; Repair group 45

- Unplug multi-pin connector from control unit -J104.
- Check multi-pin connector between wiring harness and control unit -J104.





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-> Socket designations of test box V.A.G 1598/20 are identical with contact designations on control unit -J104 as well as those on wiring harness connector.

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

- Connect test box V.A.G 1598/20 to multi-pin connector on ABS harness.

Contact assignment of wiring harness/control unit -J104 multiple connector.

Contact	Wiring to component...
1	Voltage supply from terminal 15
2	Hydraulic unit; actuation of return pump relay -J105
3	Hydraulic unit; change-over valve (secondary piston circuit) -N168
4	Hydraulic unit; EDL outlet valve -N169
5	Hydraulic unit; inlet valve, front left -N101
6	Hydraulic unit, inlet valve rear right -N133
7	Hydraulic unit; actuation of return pump relay -J105
9	Front left speed sensor -G47 - Vehicles with FWD and ABS/EDL - Vehicles with FWD and ABS/EDL/TCS
10	Front left speed sensor -G47
11	Rear right speed sensor -G44
12	Rear left speed sensor -G46
13	Rear left speed sensor -G46
14	Front right speed sensor -G45
15	Front right speed sensor -G45 - Vehicles with FWD and ABS - Vehicles with FWD and ABS/EDL - Vehicles with 4WD and ABS/EDL (pressure control)

Contact	Wiring to component...
18	Engine control unit; MAD signal (masking of engine misfire monitoring) - On vehicles with FWD and ABS/EDL/ASR; this wiring harness is also used for transmission of MMS signal (specified engine torque).
19	Hydraulic unit; monitoring connection for return pump -V39
20	Engine control unit; engine speed - Vehicles with FWD and ABS/EDL/TCS
25	Hydraulic unit; ABS outlet valve rear left -N136
26	Hydraulic unit; ABS outlet valve, front right -N100
27	Hydraulic unit; outlet valve (pushrod piston circuit) -N167
28	Earth, terminal 31 (control unit -J104)
29	Earth, terminal 31 (control unit -J104)
31	Dash panel insert; TCS warning lamp actuation - Vehicles with FWD and ABS/EDL/TCS
32	Dash panel insert; TCS/ESP warning lamp actuation (active)
33	Hydraulic unit; ABS outlet valve, front left -N102
34	Hydraulic unit; outlet valve rear right -N135
35	Front left speed sensor -G47 - Vehicles with 4WD and ABS/EDL
36	Front left speed sensor -G47 - Vehicles with FWD and ABS

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Contact	Wiring to component...
37	Hydraulic unit; actuation of solenoid valve relay -J106
38	Rear right speed sensor -G44
42	Front right speed sensor -G45 - Vehicles with FWD and ABS/EDL/TCS - Vehicles with 4WD and ABS/EDL (suction control)
44	TCS switch - Vehicles with FWD and ABS/EDL/TCS
45	GB (gearbox control signal) - Vehicles with FWD and ABS/EDL/TCS
46	K-wire
47	Engine control unit; MMI (actual engine torque) - Vehicles with FWD and ABS/EDL/TCS
47	Brake light switch -F - Vehicles with 4WD and ABS/EDL
48	Brake light switch -F
50	Battery + (terminal 30)
53	Hydraulic unit, inlet valve rear left -N134
54	Hydraulic unit; ABS inlet valve, front right -N99
55	Hydraulic unit; Change-over valve, (pushrod piston circuit) -N166

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Notes on fault table

- The socket descriptions of test box V.A.G 1598 are identical to the contact descriptions of control unit -J104 in the current flow diagram. Incorrect test procedures can cause system damage. Do not make connections between any contacts other than those listed in the test table.

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

- The specified values refer to the readings obtained on tester V.A.G 1526 and are not necessarily applicable to other test units.
- If the readings obtained do not match the specified values, carry out the fault remedy measures in the right-hand part of the table.

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

- If the specified values are achieved, also check wiring for loose contacts and short circuit to positive and earth. This applies especially to sporadic faults.
- Use test leads V.A.G 1594 for checking continuity (bridging leads).
- If the measured figures only differ slightly from the specified values, clean the sockets and plugs of the testers and test leads (with contact spray G 000 700 04) and repeat the check. Before replacing components, check wiring and connections again. This is particularly important if the specification calls for a resistance reading of less than 10 ω.

Measuring resistance: Set measuring range (200 ω) on V.A.G 1526					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
1	5 + 33	Inlet valve -N101, outlet valve -N102, front left	▪ Electrical wiring between control unit and hydraulic unit must be OK	9ω/22ω	- Check electric wiring between control unit and hydraulic unit for short to earth or positive.
2	54 + 26	Inlet valve -N99, outlet valve -N100, front right			

3	53 + 25	Inlet valve -N134, outlet valve -N136, rear left			=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
4	6 + 34	Inlet valve -N133, outlet valve -N135, rear right			- If electrical wiring is OK renew hydraulic unit.

Measuring resistance: Set measuring range (200 ω) on V.A.G 1526					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
5 Note: Only for vehicles with ABS/ EDL or TCS system	3 + 55	Change-over valve (secondary piston circuit) -N168, Change-over valve (pushrod piston circuit) -N166	▪ Electrical wiring between control unit and hydraulic unit must be OK	12ω/28ω	- Check electric wiring between control unit and hydraulic unit for short to earth or positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If electrical wiring is OK renew hydraulic unit.
6 Note: Only for vehicles with ABS/ EDL or TCS system	4 + 27	Outlet valve (secondary piston circuit) -N169, Outlet valve (pushrod piston circuit) -N167	▪ Electrical wiring between control unit and hydraulic unit must be OK	12ω/28ω	- Check electric wiring between control unit and hydraulic unit for short to earth or positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If electrical wiring is OK renew hydraulic unit.

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Measuring resistance: Select measuring range on V.A.G 1526 (2 kω or 20 kω)					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
7	9 + 10 1) 2) 35 + 10 3) 5) 36 + 10 4)	Speed sensor - G47, front left	▪ Electrical wiring between control unit and speed sensor must be OK	400ω/2300ω	- Check electric wiring between control unit and speed sensor for short to earth or positive.
8	15 + 14 1) 3) 4) 42 + 14 2) 5)	Speed sensor - G45, front right			=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
9	13 + 12	Speed sensor - G46, rear left			- If the electrical wiring is OK renew the relevant speed sensor.

10	11 + 38	Speed sensor - G44 rear right			

The output connections on control unit -J104 are wired differently for the various different versions.

1)FWD with Bosch ABS/EDL 5 only

2)FWD with Bosch ABS/TCS 5 only

3)4WD with Bosch ABS/EDL 5 only (pressure-side control)

4)FWD with Bosch ABS 5 only

5) 4WD with Bosch ABS/EDL 5 only (suction-side control)

Measuring resistance: Select measuring range on V.A.G 1526 (200 ω)					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
11	2 + 37	Solenoid valve relay ABS -J106	▪ Electrical wiring between control unit and hydraulic unit must be OK	30ω/80ω	- Check electric wiring between control unit and hydraulic unit for short to earth or positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If electrical wiring is OK renew relay.
12	2 + 7	Return pump relay -J105	▪ Electrical wiring between control unit and hydraulic unit must be OK	30ω/80ω	- Check electric wiring between control unit and hydraulic unit for short to earth or positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If electrical wiring is OK renew relay.

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Functional check + test for correct connections					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
13 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N101 and brake line connection, front left	▪ Ignition on.		

Functional check + test for correct connections					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
			- Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 5 + 28. Depress and hold down brake pedal.	- Front left wheel can be turned by hand	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly. Repeat test step 13. If all wheels are locked, inlet valve is not functioning properly => Fault table Page 37 , Fault code 00257.
			- Remove bridge connection between 5 + 28. - Release brake pedal.	- Front left wheel locked.	

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1) Two mechanics are required to perform this test.

Functional check + test for correct connections					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
14 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N99 and brake line connection, front right	▪ Ignition on. - Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 54 + 28. Depress and hold down brake pedal.	- Front right wheel can be turned by hand.	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly. Repeat test step 14. If all wheels are locked, inlet valve is not functioning properly => Fault table Page 37 , Fault code 00259.

Functional check + test for correct connections					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
			- Remove bridge connection between 54 + 28. - Release brake pedal.	- Front right wheel locked	

1) Two mechanics are required to perform this test.

Functional check + test for correct connections					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
15 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N134 and brake line connection, rear left	▪ Ignition on. - Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 53 + 28. Depress and hold down brake pedal. - Remove bridge connection between 53 + 28. - Release brake pedal.	- Rear left wheel can be turned by hand. - Rear left wheel locked	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly. Repeat test step 15. If all wheels are locked, inlet valve is not functioning properly => Fault table Page 37 , Fault code 00274.

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1) Two mechanics are required to perform this test.

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
16 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N133 and brake line connection, rear right	▪ Ignition on.		

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
			- Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 6 + 28. Depress and hold down brake pedal.	- Rear right wheel can be turned by hand.	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly. Repeat test step 16. If all wheels are locked, inlet valve is not functioning properly => Fault table Page 37 , Fault code 00273.
			- Remove bridge connection between 6 + 28. - Release brake pedal.	- Rear right wheel locked	

1) Two mechanics are required to perform this test.

Functional check + leak test					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
17	Jumper 1 + 2, 7 + 37, 37 + 28	- Return pump -V39 - Change-over valve EDL -N168 - EDL outlet valve -N169	- Connect pressure gauge V.A.G 1310 A to front left caliper and bleed. => FWD and 4WD Running Gear; Repair group 47 Bridge across sockets 3 + 28.		- Return pump defective, renew hydraulic unit -N55 => FWD and 4WD Running Gear; Repair group 45
		- Pressure limiting valve in hydraulic unit -N55 - Outlet valve, front left -N102	- Switch on ignition for not longer than 10 seconds; switch off ignition.	- Change-over valve -N168 switched - Return pump -V39 should run. - Pressure at pressure gauge not more than 5 bar	- Check change over valve -N168 and outlet valve -N169 by measuring resistance => Test steps 5 + 6. Replace hydraulic unit -N55 if fault is found.
					Test step 17: Continued on next page.

Functional check + leak test					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

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17 Continued:		- Outlet valve, rear right -N135	- Bridge across sockets 4 + 28. Switch on ignition for not longer than 10 seconds; switch off ignition. - Detach pressure gauge V.A.G 1310 A and bleed valves. => FWD and 4WD Running Gear; Repair group 47	- Outlet valve -N169 switched - Increase in pressure on gauge: FWD:170 ±25 bar 4WD, pressure-side control: 90 ± 25 bar 4WD, suction-side control: 170 ± 25 bar	- Pressure limiting valve and/or outlet front left -N102 and/or rear right -N135. Renew hydraulic unit -N55

Functional check + leak test					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	Action in the event of deviation from specified value
18	Jumper 1 + 2, 7 + 37, 37 + 28	- Return pump -V39 - Change-over valve EDL -N166 - EDL outlet valve -N167	- Connect pressure gauge V.A.G 1310 A to front right caliper and bleed. => FWD and 4WD Running Gear; Repair group 47 Bridge across sockets 55 + 28.		- Return pump defective, replace hydraulic unit -N55 => FWD and 4WD Running Gear; Repair group 45
		- Pressure limiting valve in hydraulic unit -N55 - Outlet valve, front right -N100	- Switch on ignition for not longer than 10 seconds; switch off ignition.	- Change-over valve -N168 switched - Return pump -V39 should run. - Pressure at pressure gauge not more than 5 bar	- Check change over valve -N166 and outlet valve -N167 by measuring resistance => Test steps 5 + 6. Replace hydraulic unit -N55 if fault is found.

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Test step 18: Continued on next page.

Functional check + leak test					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	Action in the event of deviation from specified value
18 Continued:		- Outlet valve rear left -N136	- Bridge across sockets 27 + 28. Switch on ignition for not longer than 10 seconds; switch off ignition.	- Outlet valve -N167 switched - Increase in pressure on gauge: FWD:170 ±25 bar 4WD, pressure-side control: 90 ± 25 bar	- Pressure limiting valve and/or outlet valve front right -N100 and/or outlet valve rear left -N136 defective. Renew hydraulic unit -N55.

			- Detach pressure gauge V.A.G 1310 A and bleed valves. => FWD and 4WD Running Gear; Repair group 47	4WD, suction-side control: 170 ± 25 bar	

Functional check: ABS warning lamp-K47					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
19	-	Function of ABS warning lamp -K47	▪ Fault memory was interrogated and there is no fault present in the fault memory of the control unit -J104. ▪ Ignition switched off ▪ Multi-pin connector connected to control unit -J104 and engaged.		
				Test step 19: Continued on next page.	

Functional check: ABS warning lamp-K47					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
19 Continued:	-	Function of ABS warning lamp - K47	- Switch on ignition.	Warning lamp - K47 is lit up for 2 seconds and then goes out again.	- If ABS warning lamp does not light check electrical system voltage and wiring from contact 32 of control unit - J104 to dash panel insert for short to earth. ABS warning lamp does not extinguish after 2 seconds. After 3 seconds the symbol "Fault brake system" illuminates. Check wiring from contact 32 of control unit -J104 to dash panel insert for short to positive and open circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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Functional check: ABS warning lamp-K47					
					- Are the vehicle voltage and the wiring from contact 32 of control unit -J104 to the dash panel insert OK? => Fault in dash panel insert. => Electrical System; Repair group 90; Dash panel insert Dash panel insert

Functional check: Red brake fault symbol					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
20	-	Function of red symbol "Fault brake system"	▪ Brake fluid level OK => FWD and 4WD Running Gear; Repair group 47 ▪ Function of ABS warning lamp -K47 checked in test step 19. ▪ Multi-pin connector connected to control unit -J104 and engaged. ▪ Switch on ignition.		
				Test step 20: Continued on next page.	

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Functional check: Red brake fault symbol					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
20 Continued:		Function of red symbol "Fault brake system"	- On vehicles with automatic gearbox and high-line dash panel insert, press brake pedal and engage a gear.	ABS/EDL warning lamp and red brake fault symbol should light up. On vehicles with TCS traction control, TCS warning lamp will also light up if it is working properly.	- Fault in dash panel insert => Electrical System; Repair group 90; Dash panel insert Dash panel insert

Functional check: TCS warning lamp -K86. Only available with TCS equipment.					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**

Functional check: TCS warning lamp -K86. Only available with TCS equipment.					
21	-	Function of TCS warning lamp -K86	▪ Fault memory was interrogated and there is no fault present in the fault memory of the control unit -J104. ▪ Ignition switched off ▪ Multi-pin connector connected to control unit -J104 and engaged.		
				Test step 21: Continued on next page.	

Functional check: TCS warning lamp -K86. Only available with TCS equipment.					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
21 Continued:	-	Function of TCS warning lamp - K86	- Switch on ignition.	Warning lamp - K86 should light up for 2 seconds and then extinguish.	- If the TCS warning lamp does not light up, check voltage of electrical system and test wiring from contact 31 of control unit -J104 to dash panel insert for open circuit and short to positive. If ASR warning lamp lights continuously check wiring from contact 31 of control unit -J104 to dash panel insert for short to earth. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder - Are the vehicle voltage and the wiring from contact 31 of control unit -J104 to the dash panel insert OK? => Fault in dash panel insert. => Electrical System; Repair group 90; Dash panel insert Dash panel insert

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Functional check: TCS switch, select measuring range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**

Functional check: TCS switch, select measuring range on V.A.G 1526: 20 V =					
22	-	Function of TCS switch	▪ Ignition switched off ▪ Function of TCS warning lamp -K86 checked in test step 21. ▪ Multi-pin connector connected to control unit -J104 and engaged. Switch on ignition.		
			- Operate TCS switch.	TCS warning lamp -K86 illuminates.	- Switch off the ignition. Release multiple connector from control unit -J104 and detach.
			- Press TCS switch again.	TCS warning lamp -K86 goes out.	- Connect test box V.A.G 1598/20.
					Test step 22: Continued on next page.

Functional check: TCS switch, select measuring range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
22	28 + 44	Function of TCS switch	▪ Ignition switched on		
Continued:			- TCS switch not pressed	0.0 - 0.5 V	
			- TCS switch pressed	10.0 - 14.5 V	- Check wiring from contact 28 to earth. Check wiring from contact 44 to TCS switch, contact 6. Check voltage supply from contact 5 of TCS switch to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If no fault has been found in the previous test steps, renew TCS switch.

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**

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Select voltage test range on V.A.G 1526: 20 V =					
23	1 + 28 1 + 29	Voltage supply of control unit through terminal 15	▪ Ignition switched on	10.5 - 14.5 V	- Check wiring from contacts 28 and 29 to earth. Check wiring from contact 1 to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

4.7 - Fault table

- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03
- Check the control unit version => Page 18 and press the ⇒ key.
- Press keys 0 and 2 for "Interrogate fault memory" function and press Q key to confirm entry.

Notes:

- Each fault is assigned a 5-digit fault code. It is listed in the left-hand column of the fault table. The message identifying the fault and the fault code will be printed out on the printer of fault reader V.A.G 1551 if the Print button is pressed. The fault code does not appear on the display of V.A.G 1551.
- The content of the fault memory is retained until it is erased. => Page 5 .
- Sporadic faults are additionally indicated by "/SP" on the right-hand side of the display.
- Static faults which cannot be detected when the vehicle is stationary are also identified with "/SP" after the ignition has been switched off and then on again.
- The following table includes all the faults which can be detected by the control unit -J104 and displayed and printed out by V.A.G 1551. Faults are listed according to fault codes.

Fault table

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V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00000 No fault recognised! This display means that the self-diagnosis is finished. No faults are stored in the fault memory. If relevant warning lamps light up, in spite of this display appearing, check the following points.	- Voltage supply for control unit -J104 less than 10.5 V at a speed of less than 6 km/h. - Open circuit in wiring for warning lamp -K47 between control unit -J104 and dash panel insert -J218 If no fault can be traced, and the problem continues to exist, there may be a mechanical malfunction (solenoid valve sticking).	- Refer to "Warning lamp functions overview" - Proceed to "Electrical check", functional test => Page 23 .

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00257		

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
ABS inlet valve, front left -N101	- Open circuit or short to positive/ earth in wiring between ABS hydraulic unit -N55 and control unit -J104. - Inlet valve -N101 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 1 and 13. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00259 ABS inlet valve, front left -N99	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS inlet valve -N99 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 2 and +14. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

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V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00265 ABS outlet valve, front left -N102	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - Outlet valve -N102 defective.	- Perform "Electrical check" =>Page 23 , Test step 1. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00267 ABS outlet valve, front right -N100	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS outlet valve -N100 defective.	- Perform "Electrical check" =>Page 23 , Test step 2. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00273 ABS inlet valve, rear right -N133	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS inlet valve -N133 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 4 and +16. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00274		

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
ABS inlet valve, rear left -N134	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS inlet valve -N134 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 3 and +15. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00275 ABS outlet valve, rear right -N135	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS outlet valve -N135 defective.	- Perform "Electrical check" =>Page 23 , Test step 4. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00276 ABS outlet valve, rear left -N136	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS outlet valve -N136 defective.	- Perform "Electrical check" =>Page 23 , Test step 3. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00283 Front left speed sensor -G47 Or:	- Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G47 incorrectly installed - Speed sensor -G47 defective. - Short to earth.	- Check, clean or renew rotor. => FWD and 4WD Running Gear; Repair group 45 , 23 , Test step 7. If no fault is traced by "Read measured value block" or performing "Electrical check" test all wires and connectors for loose contacts
Front left speed sensor -G47 Open circuit / short to positive	- Incorrect control unit version - Open circuit, short to positive in wiring between speed sensor -G47 and control unit -J104.	- Check control unit identification => Page 18 . If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00285 Front right speed sensor -G45 Or:	- Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G45 incorrectly installed - Speed sensor -G45 defective. - Short to earth.	- Check, clean or renew rotor. => FWD and 4WD Running Gear; Repair group 45 , 23 , Test step 8. If no fault is traced by "Read measured value block" or performing "Electrical check" test all wires and connectors for loose contacts

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V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
Front right speed sensor -G45 Open circuit / short to positive	- Incorrect control unit version - Open circuit, short to positive in wiring between speed sensor -G45 and control unit -J104.	- Check control unit identification => Page 18 . If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00287 Rear right speed sensor -G44 Or:	- Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G44 incorrectly installed - Speed sensor -G44 defective. - Short to earth.	- Check, clean or renew rotor. => FWD and 4WD Running Gear; Repair group 45 23 , Test step 10.
Rear right speed sensor -G44 Open circuit / short to positive	- Open circuit, short to positive in wiring between speed sensor -G44 and control unit -J104.	- If no fault is traced by "Read measured value block" or performing "Electrical check" test all wires and connectors for loose contacts If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00290 Rear left speed sensor -G46 Or:	- Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G46 incorrectly installed - Speed sensor -G46 defective. - Short to earth.	- Check, clean or renew rotor. => FWD and 4WD Running Gear; Repair group 45 23 , Test step 9.
Rear left speed sensor -G46 Open circuit / short to positive	- Open circuit, short to positive in wiring between speed sensor -G46 and control unit -J104.	- If no fault is traced by "Read measured value block" or performing "Electrical check" test all wires and connectors for loose contacts If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00301 ABS return pump -V39	- Open circuit in wiring or contact resistance in earth connection or voltage supply to ABS return pump -V39. - Open circuit or short to positive/earth in wiring between relay -J105 and control unit -J104. - Relay for ABS return pump -J105, return pump -V39 or hydraulic unit defective.	- Locate and rectify open circuit or contact resistance. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Check relay -J 105, return pump -V39 and hydraulic unit -N55, Perform "Electrical check" => Page 22 .

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V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00302 Solenoid valve relay ABS -J106	- Defective wiring or excessive resistance in earth connection to solenoid valve relay -J106. - Open circuit or short to positive/earth in wiring between relay -J106 and control unit -J104. - Solenoid valve relay -J106 or hydraulic unit -N55 defective	- Check earth connection for contact resistance and defective wiring => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Check relay -J 106 and hydraulic unit, Perform "Electrical check" => Page 22 .

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00526 Brake light switch -F		
FWD: Open circuit	- Both brake lights -M9, -M10 or control unit -J104 defective. - Wiring from brake lights to control unit defective.	- Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Replace bulbs Check brake light switch, "Read measured value block", display group 2 => Page 22 .
4WD: Implausible signal	- Open circuit or short circuit to positive/earth in wiring between brake light switch and bulbs for brake lights -M9, -M10 or control unit -J104. - Brake light bulbs -M9 or -M10 defective. - Brake light switch defective	

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00529 Speed information missing No signal - This fault can only occur on vehicles with TCS	- Open circuit or short circuit to positive/earth in wiring between control unit -J104 and engine control unit.	- "Read measured value block", display group 3 =>Page 23 . Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Engine control unit defective.	- If the rev counter in the instrument cluster is not working, and no fault can be found in the wiring, this means that the engine control unit is defective and must be renewed.
	- Control unit -J104 defective.	- If rev counter in instrument cluster is not working and no fault is found in wiring, control unit -J104 is defective and is to be replaced.

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V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00532 Power supply Signal too low Notes: - This fault affects the voltage supply for the control unit. - This fault is only stored in the memory if it occurs at a road speed above 6 km/h. - The ABS, ABS/EDL and ASR system will be switched on again and the warning lamps will go out as soon as the supply voltage returns to the required level.	- Open circuit or excessive resistance in voltage supply wiring from terminal 15 to control unit -J104, contact 1. - Loss of voltage in electrical system - Battery defective	- Perform "Electrical check" =>Page 23 , Test step 23. Locate and rectify open circuit or contact resistance. Check alternator and voltage regulator. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Test battery => Electrical System; Repair group 90; Dash panel insert Dash panel insert

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00597 Differing wheel speed impulses	- Rotor dirty or damaged	- Check rotor. => Brake System; Repair group 45
	- Excessive play in wheel bearing	- Check wheel bearing => Brake System; Repair group 45
	- Speed sensors -G44, -G45, -G46, -G47 incorrectly installed - Speed sensors -G44, -G45, -G46, -G47 defective.	- Check speed sensors. => Brake System; Repair group 45 23 , Test steps 7 to 10.
	- Wheels or tyre sizes not the same on all four wheels	- Check wheels and tyre sizes

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00623 ABS/gearbox electrical connection - This fault can only occur on vehicles with TCS	**Manual gearbox:** - ABS/EDL/TCS control unit -J104 incorrectly coded - Short to positive at terminal 45.	- Check encoding of ABS/EDL/TCS-control unit -J104 => Page 19 . Trace and repair short circuit => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	Automatic gearbox - Open circuit or short to earth between ABS/EDL/TCS control unit -J104 and automatic gearbox control unit -J217. - ABS/EDL/TCS control unit -J104 incorrectly coded	- Check encoding of ABS/EDL/TCS-control unit -J104 => Page 19 . Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00642		

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V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
EDL change-over valve, front right -N166	- Open circuit or short to positive/earth in wiring between hydraulic unit -N55 and control unit -J104. - EDL change-over valve -USV2 -N166 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 5 and +18. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00643 EDL outlet valve, front right -N167	- Open circuit or short to positive/earth in wiring between hydraulic unit -N55 and control unit -J104. - EDL outlet valve -ASV2 -N167 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 6 and +18. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00644 EDL change-over valve, front left -N168	- Open circuit or short to positive/earth in wiring between hydraulic unit -N55 and control unit -J104. - EDL change-over valve -USV2 -N168 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 5 and +17. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00645 EDL change-over valve front left -N169	- Open circuit or short to positive/earth in wiring between hydraulic unit -N55 and control unit -J104. - EDL outlet valve -ASV2 -N169 defective.	- Perform "Electrical check" =>Page 23 , Perform test steps 6 and +17. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00646 ABS-TCS/engine electrical connection 1	- Open circuit or short circuit to positive/earth in wiring between control unit -J104, terminal 18 and engine control unit.	- Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Note: The following signals are sent from control unit -J104 to engine control unit via this connection: - MAD signal (masking of engine misfire monitoring) for On Board Diagnostics - MMS signal (engine torque -specified)	- Control unit -J104 defective. - Engine control unit defective.	- Renew control unit -J104. Renew engine control unit

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V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00647 ABS-TCS/engine electrical connection 2	- Open circuit or short circuit to positive/earth in wiring between control unit -J104, terminal 47 and engine control unit.	- "Read measured value block", display group 3 =>Page 23 . Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Note: The following signal is transmitted via this connection from engine control unit to control unit -J104: - MMI signal (engine torque - actual)	- Engine control unit defective. - ABS/EDL/TCS control unit -J104 defective.	- Renew engine control unit Replace ABS/EDL/TCS control unit -J104.

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00668 Vehicle voltage, terminal 30 Open circuit - On vehicles with EDL control unit -J104 requires this voltage supply after ignition is switched off to calculate brake temperature => Page 12 .	- Voltage supply to control unit -J104 (contact 50) open or short to earth.	- Test wiring => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 print-out Fault code	Possible causes of fault	Fault remedy
00761 Fault stored in engine control unit - This fault can only occur on vehicles with TCS	- A fault has been stored in the engine control unit. The engine control unit is not able to reduce engine torque.	- Rectify fault in engine management as described in relevant Workshop Manual (engine). Erase fault memory of engine control unit.
65535 Control unit defective	- Control unit -J104 defective.	- Renew control unit -J104. Note: In this case the fault memory is not to be erased. The data stored in the fault memory aid the detection of the damage in the control unit. This data is used for the continuous improvement of the product.

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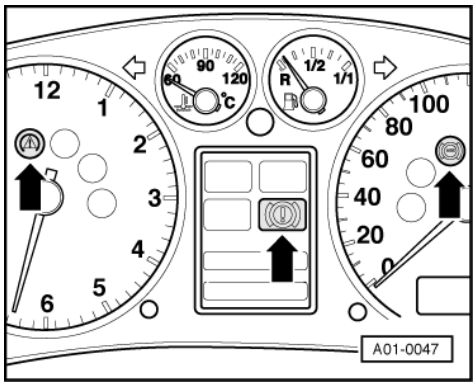
5 - ABS/EDL/TCS Bosch 5.3

5.1 - ABS/EDL/TCS Bosch 5.3

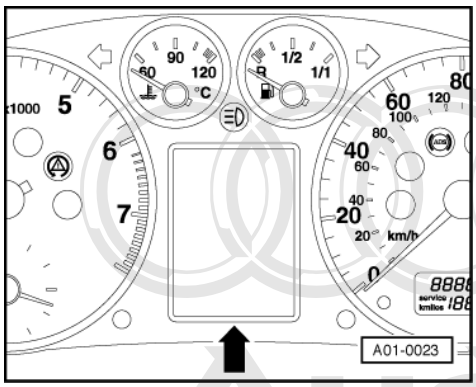
5.2 - Table of warning lamp functions



- If the self-diagnosis function detects a fault in the system, this will be indicated (with ignition on) by the warning lamps in the dash panel insert. The warning lamps are located in the dash panel insert.

-> Dash panel insert without FIS

- The diagram shows the warning lamps for ABS/EDL -K47 (right arrow), brake system warning lamp -K118 (centre arrow, red brake fault symbol) and TCS warning lamp -K86 (left arrow).



-> Dash panel insert with FIS

- The warning lamp -K118 is not supplied with FIS. The red brake fault symbol appears in the display.
- If the brake system is not fully functional, but the ABS/EDL warning lamp -K47 and the red brake fault symbol do not light up, this means the fault must be sought in the conventional braking system (mechanical/hydraulic components)

=> Brake System; Repair group 46

=> Brake System; Repair group 47

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ABS/EDL -K47	Brake system	TCS -K86 1)	Reasons for warning lamps illuminating
			If an irregularity occurs in the self test after switching on the ignition and the warning lamps -K47 and -K86 do not light for 2 seconds test the warning lamps; => Perform "Electrical check" Page 65 , Test steps 8 and 10. Failure to light may be due to the following: - Inadequate battery voltage. None of the warning lamps in the dash panel insert light. Check the battery. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder => Electrical System; Repair group 27; Battery Battery
		X 1)	- If the ABS/EDL warning lamp does not light up during the self-test phase: Short to earth in wiring from contact 21 of control unit -J104 to dash panel insert (actuation of ABS/EDL warning lamp). This fault does not affect the actuation of the TCS warning lamp. TCS warning lamp lights during self test on vehicles fitted with traction control system (TCS) => Perform "Electrical check", Page 65 , Test step 8.
X			- The vehicle is equipped with traction control system (TCS). If the ABS/EDL warning lamp illuminates during the self-test phase: TCS warning lamp does not light during self test => Perform "Electrical check", Page 65 , Test step 10.

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

ABS/EDL -K47	Brake system	TCS -K86 1)	Reasons for warning lamps illuminating
X		X 1)	- If the actuation of warning lamps -K47 and -K86 and the voltage supply to control unit -J104 are OK, the warning lamps will light up for 2 seconds during the self test phase when the ignition is switched on. - Check actuation of red brake fault symbol. Perform "Electrical check", Page 74

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

ABS/EDL -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
X		X 1)	The following applies to vehicles with control units which incorporate a back-up feature for the electronic brake pressure distribution function: These vehicles can be identified by referring to the notes in the table under "Interrogate control unit version": => Page 74

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

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ABS/EDL -K47	Brake system	TCS -K86 1)	Reasons for warning lamps illuminating
X	X	X 1)	The vehicle is with or without TCS. If the ABS/EDL warning lamp illuminates continuously after the ignition is switched on, and the red brake fault symbol also illuminates 3 seconds after the ignition is switched on: Important There is a risk of accident if the vehicle is driven in this condition. The function of the brake system will be impaired. As the brake pressure is no longer controlled by the electronic brake force distribution the rear wheels tend to break excessively. Due to this the rear of the vehicle may break away un-expectedly. - Fault reader V.A.G 1551 is connected and the diagnostic link has been established with control unit -J104. - In vehicles with automatic gearbox and "high-line" dash panel insert, the red brake fault symbol does not appear immediately after the ignition is switched on. The driver instruction "Apply foot brake when selecting gear with vehicle stationary" is given priority. Operate the foot brake and engage a gear. If the actuation of the red brake fault symbol is OK, the symbol will now light up. - Detection of fault by self-diagnosis results in switching off of electronic brake pressure distribution EPBD, ABS, EDL and TCS. "Interrogate fault memory" =>Page 74

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

ABS/EDL -K47	Brake system	TCS -K86 1)	Possible reasons for warning lamps illuminating
X	X	X 1)	Vehicles with control units without EBPD emergency runningcan be identi-fied by referring to the notes column under "Interrogate control unit version"; => Page 74

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

ABS/EDL -K47	Brake system	TCS -K86 1)	Reasons for warning lamps illuminating
		X 1)	The vehicle is equipped with traction control system (TCS). - A fault exists which affects only the TCS. The ABS and EDL systems are not switched off. Interrogate fault memory => Page 65 , Test steps 10 and 11. - TCS in controlled operation. Warning lamp for TCS flashes 3 times per second. - Short to positive in TCS switch: The TCS warning lamp will extinguish 5 minutes after the ignition is switched on. - The warning lamp illuminates continuously after the ignition is switched on, and none of the faults listed in this section of the table are present. Short to earth in wiring from contact 20 of control unit -J104 to dash panel insert (actuation of TCS warning lamp).
			There is a problem. The warning lamps light during the self test and then extinguish normally. Failure to light may be due to the following: - "Brake light switch-F" fault stored in fault memory; Interrogate fault memory => Page 53 .

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

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ABS/EDL -K47	Brake system	TCS -K86 1)	Reasons for warning lamps illuminating
X	X		The vehicle is with or without TCS. No faults are stored in the fault memory. If the ABS/EDL warning lamp illuminates continuously after the ignition is switched on, and the red brake fault symbol also illuminates 3 seconds after the ignition is switched on: TCS warning lamp does not light even on vehicles with TCS. Important There is a risk of accident if the vehicle is driven in this condition. The function of the brake system will be impaired. As the brake pressure is no longer controlled by the electronic brake force distribution the rear wheels tend to break excessively. Due to this the rear of the vehicle may break away unexpectedly. - Open circuit or short to positive in wiring from contact 21 of control unit -J104 to dash panel insert (actuation of ABS warning lamp) => Perform "Electrical check", Page 65 , Test step 1.
	X		No faults are stored in the fault memory. The red brake fault symbol illuminates continuously after the ignition is switched on. - Brake fluid level too low - Fault in dash panel insert: Perform "Electrical check", Page 65 , Test step 9.

1) TCS warning lamp is only featured on vehicles fitted with traction control system (TCS).

5.3 - Interrogating control unit version

- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03.
- Go back to the initial settings of the program by pressing the ⇒ key:

-> Indicated on display:

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

- Press keys 0 and 1 for the function "Interrogate control unit version" and confirm entry with Q key.

Note:

- The control unit version can only be altered by fitting a new control unit.
- Also refer to the Parts List for the correct control unit -J104 for the vehicle.

-> Indicated on display:

```
8E0 614 111 1)      2)      3)
Coding 00000      WSCXXXXX
```

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Code is only shown for vehicles with traction control system (TCS). Encode control unit Page => 51 .

The workshop code, WSC XXXXX, identifies the workshop which performed the last coding of the control unit.

Index 1): Indicates control unit index.

Index 2): Indicates the system designation.

Index 3): Indicates hardware and software status.

- Press ⇒key.

-> Indicated on display:

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

ABS control unit versions without CAN bus

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
FWD; Bosch ABS 5.3	1AC	8E0 614 111	-	Not encodable	Separate wires	Hydraulic control unit for production (not pre-bled)
		8E0 614 111	AB	Not encodable	Separate wires	Hydraulic control unit for production (not pre-bled) With back-up for electronic brake pressure distribution (EBPD).
		8E0 614 111	AD	Not encodable	Separate wires	Hydraulic control unit for production (not pre-bled) With EBPD back-up and speed sensor outputs for navigation rear left and right.
		8E0 614 111	D	Not encodable	Separate wires	Hydraulic control unit for service sector (pre-bled)
		8E0 614 111	AC	Not encodable	Separate wires	Hydraulic control unit for service sector (pre-bled) With back-up for electronic brake pressure distribution (EBPD).
		8E0 614 111	AE	Not encodable	Separate wires	Hydraulic control unit for service sector (pre-bled) With EBPD back-up and speed sensor outputs for navigation rear left and right.

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1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

ABS and EDL control unit versions without CAN bus

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
FWD/ABS/EDL Bosch 5.3	1AH	8E0 614 111	P	Not encodable	Separate wires	Hydraulic control unit for production (not pre-bled)
		8E0 614 111	B	Not encodable	Separate wires	Hydraulic control unit for production (not pre-bled) with integrated suction damper and EBPD back-up
		8E0 614 111	Q	Not encodable	Separate wires	Hydraulic control unit for service sector (pre-bled)

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
		8E0 614 111	F	Not encodable	Separate wires	Hydraulic control unit for service sector (pre-bled) with integrated suction damper and EBPD back-up

1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
4WD/ABS/EDL Bosch 5.3	1AH	8E0 614 111	M	Not encodable	Separate wires	Hydraulic control unit for production (not pre-bled)
		8E0 614 111	A	Not encodable	Separate wires	Hydraulic control unit for production (not pre-bled) with integrated suction damper and EBPD back-up
		8E0 614 111	N	Not encodable	Separate wires	Hydraulic control unit for service sector (pre-bled)
		8E0 614 111	E	Not encodable	Separate wires	Hydraulic control unit for service sector (pre-bled) with integrated suction damper and EBPD back-up

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1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

TCS control unit versions Bosch 5.3 without CAN bus

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
FWD/ABS/TCS Bosch 5.3	1AJ	8E0 614 111	R	Encodable Page => 51	Separate wires	Hydraulic control unit for production (not pre-bled)
		8E0 614 111	C	Encodable Page => 51	Separate wires	Hydraulic control unit for production (not pre-bled) with integrated suction damper and EBPD back-up
		8E0 614 111	S	Encodable Page => 51	Separate wires	Hydraulic control unit for service sector (pre-bled)

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
		8E0 614 111	G	Encodable Page => 51	Separate wires	Hydraulic control unit for service sector (pre-bled) with integrated suction damper and EBPD back-up

1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

TCS control unit versions Bosch 5.3 with CAN bus

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	Notes:
FWD/ABS/TCS Bosch 5.3	1AJ	4D0 614 111	H	Not encodable	CAN bus	Hydraulic control unit for production (not pre-bled)
		4D0 614 111	J	Not encodable	CAN bus	Hydraulic control unit for service sector (pre-bled)
		8E0 614 111	H	Encodable Page => 51	CAN bus	Hydraulic control unit for production (not pre-bled) with integrated suction damper and EBPD back-up
		8E0 614 111	J	Encodable Page => 51	CAN bus	Hydraulic control unit for service sector (pre-bled) with integrated suction damper and EBPD back-up
		8E0 614 111	AH	encodable	CAN bus	120ω
		8E0 614 111	AJ	encodable	CAN bus	120 ω
		8E0 614 111	AQ	encodable	CAN bus	1120 ω
		3B0 614 111		encodable	CAN bus	1120 ω

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1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

5.4 - Encoding control unit

Have you just replaced a control unit with traction control function (TCS), or is one of the following faults stored in the fault memory of the control unit?

- "ABS/EDL/gearbox - electrical connection"
- "Control unit incorrectly encoded"
- "CAN bus - no message from gearbox control unit"

The control unit must be coded according to the type of engine and gearbox.

Notes:

- The coding can only be performed if a workshop code is stored in V.A.G 1551

=> Operating instructions V.A.G 1551

- The 5-digit coding will appear when the control unit identification is displayed.

- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03
- Check the control unit version => Page 48 and press the ⇒ key.
- Press ⇒key.

-> Indicated on display:

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

- Press keys 0 and 7 for "Coding control unit" function.

-> Indicated on display:

```
Rapid data transfer      Q
07 - Coding control unit
```

- Confirm input with Q key.

-> Indicated on display:

```
Code control unit     Q
Enter code number      XXXX
```

- Enter the required code number and confirm with Q key.

Coding table: ABS/EDL/TCS with CAN

Engine	Gearbox	Data transfer via:	Control unit part number with index		Code no.
1.8-T1) 4-cyl. 5V	Manual gearbox 01E	CAN bus	8E0 614 111	AH; AJ; AQ	00022
	Automatic gearbox 01V	CAN bus	8E0 614 111	AH; AJ; AQ	00021
2.4 l 6-cyl. 5V 2.7 l 6-cyl. 5V 2.8 l 6-cyl. 5V	Manual gearbox 01E	CAN bus	8E0 614 111	AH; AJ; AQ	00032
2.4 l 6-cyl. 5V 2.7 l 6-cyl. 5V 2.8 l 6-cyl. 5V	Automatic gearbox 01V	CAN bus	8E0 614 111	AH; AJ; AQ	00031
2.5 l. 6-cyl. 4V TDI 1.9-PD2) 4-cyl. 4V TDI	Manual gearbox 01E	CAN bus	8E0 614 111	AH; AJ; AQ H; J;	00012
2.5 l. 6-cyl. 4V TDI 1.9-PD2) 4-cyl. 4V TDI	Automatic gearbox 01V	CAN bus	8E0 614 111	AH; AJ; AQ H; J;	00011

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1) 1.8 T signifies 1.8 litre turbo engine

2) 1.9 PD signifies 1.9 litre pump nozzle diesel engine

Engine	Gearbox	Data transfer via:	Control unit part number with index		Code no.	Note:
2.4 l. 6-cyl. 5V	Manual gearbox 012	Separate wires	8E0 614 111	R; S C; G	00000	Contact 28 on control unit - J104 not used.

Engine	Gearbox	Data transfer via:	Control unit part number with index		Code no.	Note:
	Automatic 01V gearbox	Separate wires	8E0 614 111	R; S C; G	00003	12 V applied to contact 28 on control unit - J104.
2.8 l. 6-cyl. 5V	Manual gear- 012 box	Separate wires	8E0 614 111	R; S C; G	00000	Contact 28 on control unit - J104 not used.
	Automatic 01V gearbox	Separate wires	8E0 614 111	R; S C; G	00003	12 V applied to contact 28 on control unit - J104.

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-> The display shows the control unit identification and the code entered (e.g. 00000).

```
4D0 907 379 X System des.     Software
stat.
Coding 00000     WSCXXXXX
```

- Press ⇒key.

-> Indicated on display:

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

- Press keys 0 and 6 for the "End output" function and press the Q key to confirm entry.

5.5 - Reading measured value block

The control unit can transfer measured values. This test data delivers information about the condition of the system and the sensors connected. In many cases the transferred test data can be used to support the fault finding and remedy. The test data available from the Bosch series 5.3 ABS/EDL are grouped together in four display groups, which can be called up via display group numbers.

- Observe the safety precautions applicable to test drives
- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03

Notes:

- When the printer is switched on, the contents of the display will be printed out on the fault reader log.
- When "Read measured value block", also check wiring and connectors for loose contacts.

- Check the control unit version => Page 48 and press the ⇒ key.

-> Indicated on display:

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

- Press keys 0 and 8 for "Read measured value block" function.

-> Indicated on display:

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

- Confirm input with Q key.

-> Indicated on display:

```
Read measured value block      Help
Enter display group number     XXX
```

- Press keys 0, 0 and 1.
- Confirm input with Q key.

Test table, display group 1

- The display zones 1 to 4 show the actual wheel speeds at the tyre circumference in km/h. These are calculated by control unit -J104 on the basis of the pulses received from the wheel speed sensors. If one of the display zones shows no reading, proceed as for fault codes 00283, 00285, 00287, 00290 "Speed sensor". Fault table
- In order to check that the speed sensor signals are correctly assigned to the four wheels, the vehicle must be raised. On vehicles with manual gearbox put the gear lever in neutral. On vehicles with automatic gearbox move the selector lever to position "N". Turn appropriate wheel by hand. The other wheels must be prevented from rotating.
- When the vehicle is accelerated uniformly on a dry surface, the displayed values will increase continuously in rising whole numbers, e.g. 6km/h, 7km/h, 8 km/h.... The difference between displayed values 1 to 4 should be no more than ±1 km/h(rounding errors).If the values jump, for instance from... 6km/h, 7km/h, to 12 km/h... or if the difference between the displayed values is greater than ±1 km/h then check the installation of the wheel speed sensors and rotors.

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=> Brake System; Repair group 45

Reading measured value block			1 ⇒	◂ Indicated on display
1 ... 19 1) km/h	1 ... 19 1) km/h	1 ... 19 1) km/h	1 ... 19 1) km/h	
			Speed sensor rear right	
		Speed sensor rear left		
	Speed sensor front right			
Speed sensor front left				

1) Control unit -J104 terminates self-diagnosis if speed exceeds 19 km/h.

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551 or arrow keys ↑ and ↓ on V.A.G 1552.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

- Press keys 0, 0 and 2.
- Confirm input with Q key.

Test table, display group 2

Reading measured value block			2 ⇒	◂ Indicated on display
0 or 1	0 or 1	0 or 1	---	
			Solenoid valve relay: - 0 ⇒ Not permissible during "Read measured value block" function; relay not actuated when ignition switched on. Perform "Electrical check" =>Page 65 , Test steps 1 and 2 Voltage supply. If no fault can be found in the voltage supply, fit a new hydraulic control unit. - 1 ⇒ Specified value; relay actuated by control unit -J104 when ignition is switched on.	

Voltage at return pump motor: - 0 ⇒ Specified value, no voltage applied to return pump motor. - 1 ⇒Not permissible during "Read measured value block" function; voltage applied to return pump motor. Renew the hydraulic control unit.	
Brake light switch: - 0 ⇒ Brake pedal not operated - 1 ⇒ Brake pedal operated	Check the brake light switch in the event of deviation. "Electrical check" => Page 65 , Test step 3.

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551 or arrow keys ↑and↓on V.A.G 1552.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

Note for display group 3:

If display zones for engine speed and actual engine torque are to be read out with engine running communication between fault reader and control unit must be terminated with "End output" function => Page 5 . Then start engine and set up diagnostic link between fault reader and control unit again.

- Press keys 0 and 8 for "Read measured value block" function.
- Confirm input with Q key.
- Press keys 0, 0 and 3.
- Confirm input with Q key.

Test table, display group 3

Reading measured value block			3 ⇒	◂ Indicated on display
60 ... 8000 rpm	0 ... 100 %	0 or 1	---	
		TCS switch: (only on vehicles with traction control system (TCS/TCS): - 0 ⇒ TCS switch not activated. - 1 ⇒TCS switch actuated; system status switches from "TCS OFF" to "TCS ON" or vice versa. Check TCS switch in the event of deviation. "Electrical check" => Page 65 , Test step 11.		
		Actual engine torque (MMI): (only on vehicles with traction control system (TCS/TCS): - 0% ⇒Vehicle in overrun phase. - 20% - 30% ⇒equivalent to engine idling. - 100% ⇒ Engine delivering maximum torque. If no display appears, proceed as described for fault code 00647 "ABS-TCS/engine electrical connection 2": Fault table		
Engine speed: (only on vehicles with traction control system (TCS/TCS): - The display indicates engine speed in steps of 60rpm, starting at 60rpm. If no display appears, proceed in line with fault 00529 "Speed information missing, no signal". Fault table				

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Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551 or arrow keys ↑and↓on V.A.G 1552.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

- Press keys 0, 0 and 4.

- Confirm input with Q key.

Test table, display group 4

Reading measured value block			4 ⇒	◂ Indicated on display
hrs:min or too large or ERROR or not valid	0 or 1	0 or 1	---	

EDL/TCS not available (Only in vehicles with EDL or TCS)
- This facility is intended for use by the factory only
- 0 ⇒ EDL/TCS available
- 1 ⇒ EDL/TCS not available

EDL deactivation due to excessive brake temperature: (Only in vehicles with EDL)
- 0 ⇒ The EDL not deactivated during the last 20 ignition on/off cycles.
- 1 ⇒ The EDL deactivated during the last 20 ignition on/off cycles.

Standing time: (Only in vehicles with EDL)
- Too large: Standing time longer than 255 hrs. and 59 min. is not indicated in the display.
- ERROR Control unit -J104 has not received two valid and consistent time signals from the dash panel insert since the ignition was switched on and the engine started. Check whether the fault 01203 "ABS/Dash pan. ins. electr. connection" is stored in the memory.
- Not valid: The standing time information is not available in the present ignition cycle. If the dash panel insert or the hydraulic control unit have been renewed, the standing time calculation must first be activated by switching on the ignition for at least 20 seconds when the new component is operated for the first time. The standing time will then be displayed when the ignition is switched on again.

5.6 - Final control diagnosis

Final control diagnosis permits checking of the function of the control elements. The control elements are also called actuators. These are components which actuate the control unit when it responds to the incoming sensor signals.

The function of the "final control elements" includes all functions and properties of the final control elements under operating conditions. This means, for example:

- An electrically operated hydraulic valve which opens and closes when activated by the control unit.
- The relay of an electric motor which starts the motor when activated by the control unit. Engine starts and produces the required power.

Before running a final control diagnosis, it is advisable to ensure that there are no electrical faults in the system you wish to test. This will enable you to recognise any mechanical faults. Perform fault-finding procedure as described on => Page 6.

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Are you sure there are no electrical faults in the system? If yes, you will recognise the faults in the mechanics of the individual control elements as soon as the final control diagnosis deviates from its description. In this case, renew the affected component.

Final control diagnosis with the Bosch ABS/EDL 5.3 system permits checking of the electrically actuated hydraulic valves and the pump motor in the hydraulic control unit. You can also check that the brake pipes going to the four wheels are connected correctly.

Notes:

- The vehicle must be raised until all wheels are free to run. Ask a second mechanic to help. It must be checked whether the wheels are locked or can be turned.

- The -C- key can be used to exit from the test sequence at any time. If the final control diagnosis should then to be repeated, communication must be terminated via the "End Output" function, => Page 5 , and then re-established.

- To avoid overloading the "final control elements" they are only actuated during the test sequence for a period of 60 or 90 seconds. The final control test will be terminated if the "⇒ key is not pressed within this period.
- The ABS/EDL warning lamp and the red brake fault symbol flash during the final control diagnosis.
- If the brake pedal is pressed repeatedly this will exhaust the vacuum in the brake servo. For this reason, the brake pedal must be pressed harder in order to achieve the same braking effect. It may be advisable to start the engine briefly. The vacuum in the servo is then built up again.

When implementing the final control diagnosis function the individual test steps are shown in the second line of the V.A.G 1551 display. The following abbreviations are used:

I = Inlet valve
O = Outlet valve
FL = front left
FR = front right
RL = rear left
RR = rear right
VBAT = Battery voltage applied to valve
0V = No voltage at valve; 0 V
Locked/free = Wheel condition; must be checked by 2nd mechanic
Hydr-P = Hydraulic pump

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- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03
- Check the control unit version => Page 48 and press the ⇒ key.

-> Indicated on display:

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

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

-> Indicated on display:

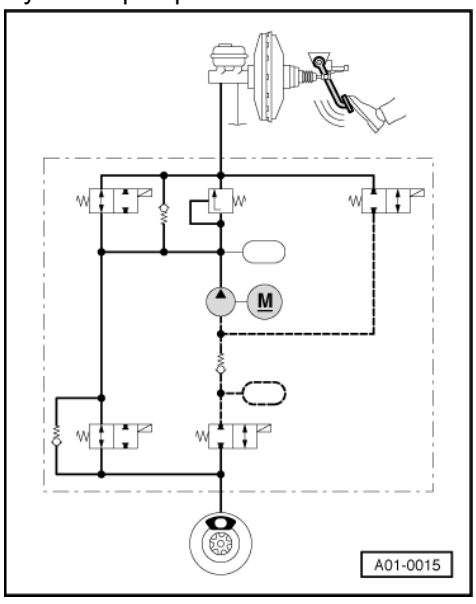
```
Rapid data transfer      Q
03 - Final control diagnosis
```

- Confirm input with Q key.

-> Indicated on display:

```
Final control diagnosis     -
Hydraulic pump ABS -V39
```

Hydraulic pump ABS/EDL -V39 must run. It can be heard.



-> When you put your foot on the brake pedal you can feel it vibrating. The brake pedal vibrates because the hydraulic pump generates pressure pulses in the brake pipes. These pressure pulses induce vibrations. These are transferred to the brake pedal and the vibrations can be detected there.

The pressure pulses in the brake pipes are not sufficient to lock the wheels.

-> The drawing on the left is a schematic diagram of the hydraulic circuit of an ABS/EDL system. This will give a better understanding of the various test steps in the final control diagnosis.

- The shaded components are active.
- Thin solid lines represent hydraulic pipes or hoses which are not under pressure.
- Thick broken lines represent hydraulic pipes or hoses working as suction lines.
- Thick solid lines represent hydraulic pipes or hoses which are under pressure.

- Press ⇒key.

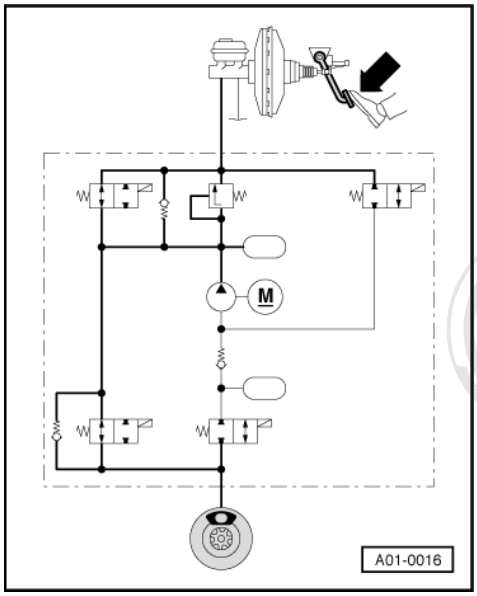
-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IFL: 0V     OFL: 0V     wheel FL blocked
```



-> When you press the brake pedal, brake fluid pressure will be built up in all four wheel brake cylinders. All four wheels will be locked.

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This presupposes proper functioning of the mechanical and hydraulic components of the brake system. This means, that the brake master cylinder is able to build up pressure in all wheel brake cylinders and that there are no leaks in the hydraulic connections and pipes. If the wheels do not lock, perform a visual inspection of the brake fluid reservoir, the master cylinder, the hydraulic unit and the wheel cylinders.

To start with, however, concentrate on the front left wheel. The function of the control elements for this wheel is tested first.

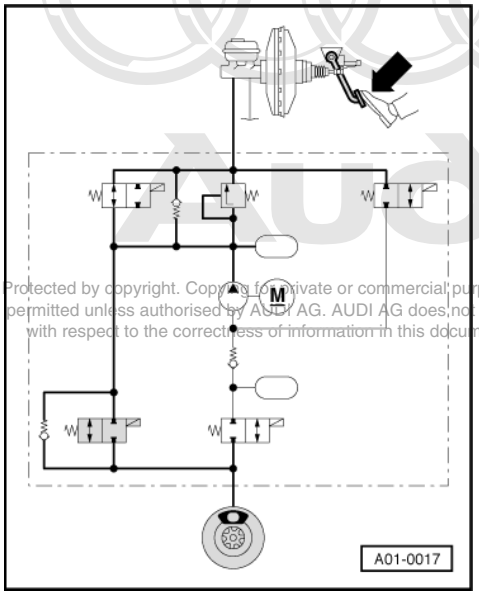
Note:

This test step in the final control diagnosis corresponds to the "pressure build-up" phase during ABS-controlled braking.

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IFL: VVBAT     OFL: 0V      wheel FL
blocked
```



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Keep pressing the brake pedal.

-> The inlet valve is actuated. It interrupts the brake pipe. However, the fluid pressure is still maintained in the wheel cylinder. The front left wheel remains locked.

Note:

This test step in the final control diagnosis corresponds to the "maintain pressure" phase during ABS-controlled braking.

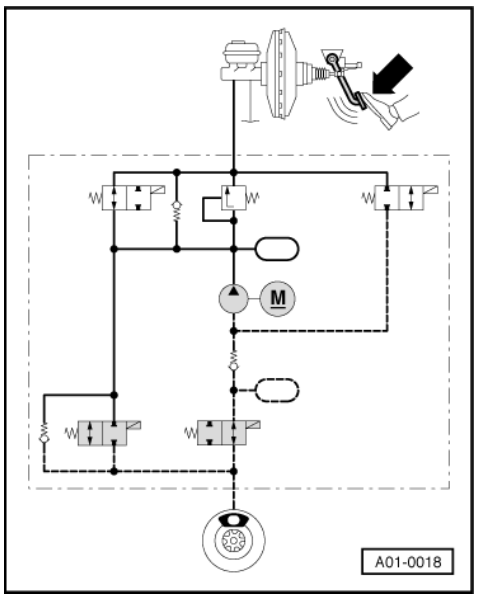
- Press ⇒key.

-> Indicated on display:

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

Keep pressing the brake pedal.

The inlet valve and the outlet valve for the front left wheel are activated. The hydraulic pump starts running and reduces the fluid pressure in the wheel cylinder via the open outlet valve.



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The brake pedal must not give, and should press back harder against your foot.

You should now be able to turn the front left wheel.

If you cannot turn the wheel, check whether the brake line for the front left wheel is correctly connected. If this is the case, this indicates that there is a mechanical fault in one of the valves, providing that there is no electrical fault in the system. Renew the hydraulic control unit.

If the brake pedal gives under your foot, this means that the inlet valve or the non-return valve connected in parallel with the inlet valve is leaking. Renew the hydraulic control unit.

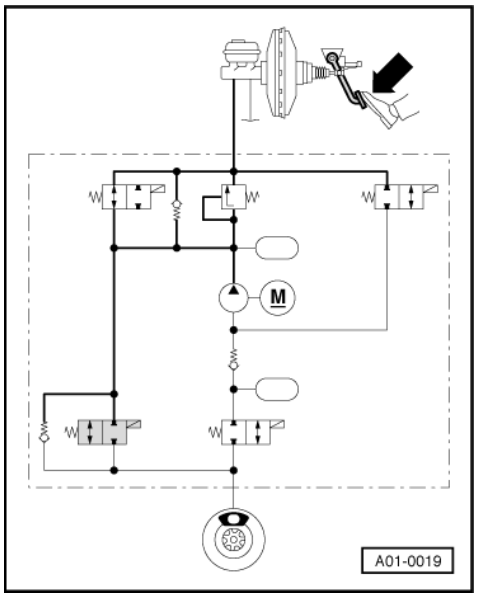
Note:

This test step in the final control diagnosis corresponds to the "pressure reduction" phase during ABS-controlled braking.

- Press ⇒key.

-> Indicated on display:

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



Hydraulic pump ABS/EDL -V39 stops running.

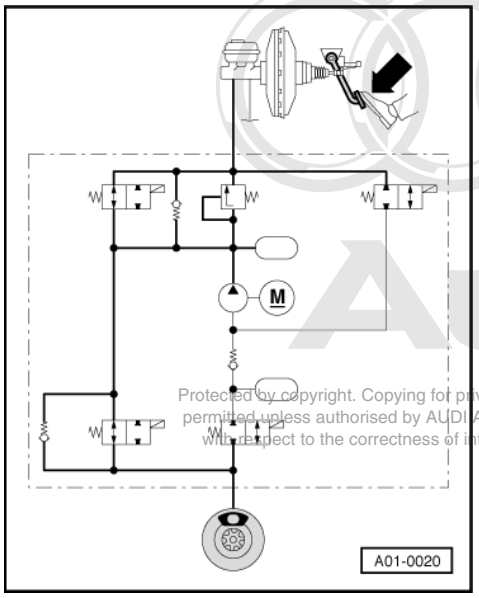
Keep pressing the brake pedal. Only the inlet valve is now actuated and interrupts the brake pipe. Front left wheel can be turned if inlet valve is not leaking.

If wheel cannot be turned, there is a leak either in the inlet valve or in the non-return valve connected in parallel with it. Renew the hydraulic control unit.

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IFL: 0V     OFL: 0V     wheel FL blocked
```



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Keep pressing the brake pedal. Inlet valve is no longer actuated. It no longer interrupts brake pipe. Brake pedal sags perceptibly. Fluid pressure is built up in front left wheel brake cylinder. Wheel locks.

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

Continue the final control diagnosis in order to check the front right, rear left and rear right wheels in turn. The test steps are the same as for the front left wheel. Thus there are not described in detail.

-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IFR: 0V     OFR: 0V     wheel FR blocked
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IFR: UBAT     OFR: 0V     wheel FR blocked
```

- Press ⇒key.

Hydraulic pump ABS/EDL -V39 must run.

Brake pedal must not give.

-> Indicated on display:

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

- Press ⇒key.

Hydraulic pump ABS/EDL -V39 stops running.

-> Indicated on display:

```
Final control diagnosis      -
IFR: UBAT     OFR: 0V     Wheel FR free
```

- Press ⇒key.

Brake pedal should give perceptibly.

-> Indicated on display:

```
Final control diagnosis      -
IFR: 0V     OFR: 0V     wheel FR blocked
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

-> Indicated on display:

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

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IRL: VBAT     ORL: 0V     wheel RL locked
```

- Press ⇒key.

Hydraulic pump ABS/EDL -V39 must run.

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Brake pedal must not give.

-> Indicated on display:

```
Final control diagnosis      -
IRL: VBAT     ORL: VBAT     Wheel RL free
```

- Press ⇒key.

Hydraulic pump ABS -V39 stops running.

-> Indicated on display:

```
Final control diagnosis      -
IRL: VBAT     ORL: 0V     Wheel RL free
```

- Press ⇒key.

Brake pedal should give perceptibly.

-> Indicated on display:

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

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

-> Indicated on display:

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

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IRR: UBAT     ORR: 0V     wheel RR locked
```

- Press ⇒key.

Hydraulic pump ABS/EDL -V39 must run.

Brake pedal must not give.

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-> Indicated on display:

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

- Press ⇒key.

Hydraulic pump ABS/EDL -V39 stops running.

-> Indicated on display:

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

- Press ⇒key.

Brake pedal should give perceptibly.

-> Indicated on display:

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

- Press ⇒key.

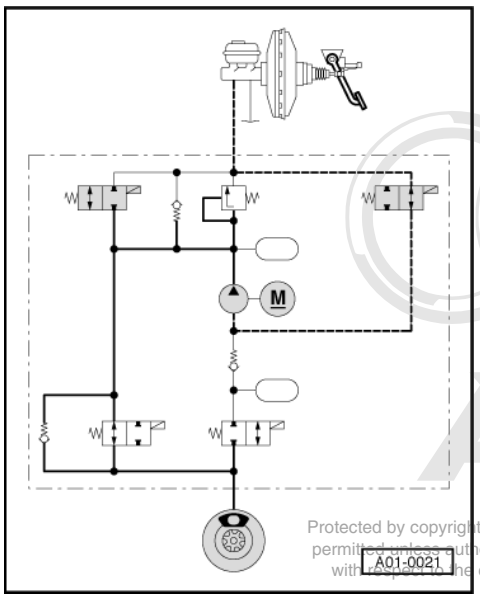
-> Indicated on display:

```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

-> Indicated on display: Only applicable for fault finding on vehicles with EDL and from production week 21/1997 models onwards. In these vehicles, this test step was revised in parallel with the introduction of the EBPD-back-up. The hydraulic pump is not actuated on vehicles prior to production week 21/1997. This test step can be disregarded on vehicles not equipped with EDL.

```
Final control diagnosis      -
EDL valves/Hydr-P: VBAT     Wheel FL/FR
locked
```



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Refer to the "Notes" column under "Interrogating control unit version" => Page 48 for identification of type of electronic brake pressure distribution fitted in vehicle.

The EDL change-over valve (left) and the EDL inlet valve (right) are actuated. ABS/EDL hydraulic pump -V39 runs for one second. Pump draws brake fluid out of fluid reservoir. The hydraulic pump builds up brake fluid pressure in the EDL controlled wheel brake cylinders. These wheels lock.

If this is not the case, this indicates that there is a mechanical fault in one of the valves, provided that there are no electrical faults in the system. Renew the hydraulic control unit.

This test step cannot be performed on vehicles not equipped with EDL. These vehicles do not have the EDL valves and the pressure limiting valve.

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
End
```

The final control diagnosis is complete. The ABS/EDL warning lamp and the brake system warning lamp extinguish.

- Press ⇒key.

-> Indicated on display:

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

Note:

- If the ABS/EDL warning lamp does not extinguish then there is a fault in the system. Keep exactly to the specified test sequence => Page 6.

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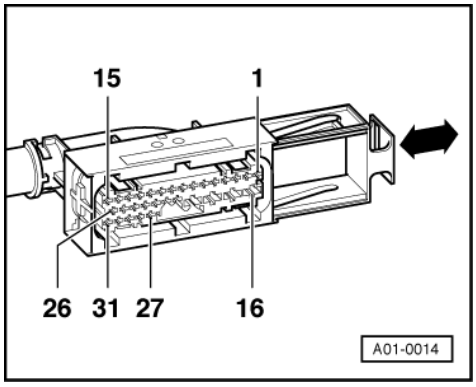
- Press keys 0 and 6 for the "End output" function and press the Q key to confirm entry.

5.7 - Electrical check

- For vehicles for which the self - diagnosis does not give any indication of the source of the fault the complete electrical check must be worked through.
- In vehicles in which the self- diagnosis provides a direct indication of the source of the fault only perform the test steps recommended in the fault table (specific testing).

Test requirements

- An "Automatic test sequence" must first be performed to establish that any faults present in the gearbox and engine control units can only originate from the ABS/EDL.
  - Connect fault reader V.A.G 1551 and select address word 00 with ignition switched on.
  - After completing the "Electrical check", interrogate and erase the fault memories of the gearbox and engine control units.



- **-> Ensure multiple connector between wiring harness and control unit -J104 is in perfect condition, i.e. not bent, broken or corroded contacts. Replace any damaged contacts using wiring harness repair kit VAS 1978.**

Note:

The instructions supplied with wiring harness repair kit VAS 1978 normally do not permit repairs to the wiring of the ABS and its associated systems. However, this only applies to the screened wiring in the systems.

- Switch ignition and electrical consumers off before commencing the check (headlights, lighting, fan, etc.).

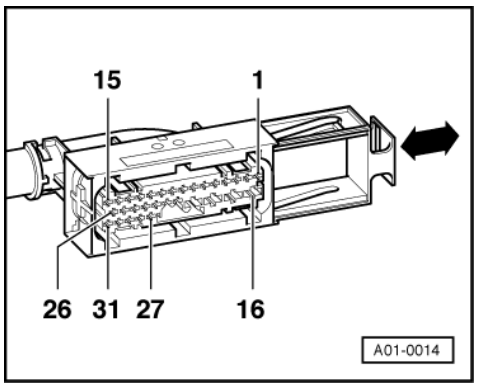
The following equipment is required:

- Test box V.A.G 1598

- Adapter 1598/27
- Adapter cable set V.A.G 1594
- Hand-held multimeter V.A.G 1526

Connecting test box V.A.G 1598 with adapter 1598/27:

- Switch ignition off.
- Connect adapter V.A.G 1598/27 to test box V.A.G 1598. Unplug multi-pin connector from control unit -J104. Connect adapter V.A.G 1598/27 and test box V.A.G 1598 to connector of ABS/EDL wiring harness.



The socket designations on test box V.A.G 1598 are identical with the contact designations on control unit -J104 and the designations of the connector on the wiring harness

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

-> Contact assignment of wiring harness/control unit -J104 multiple connector.

All contacts not listed are currently not assigned and must not be connected to other components.

Contact	Wiring to component...
1	**Rear right speed sensor -G44**
2	Rear right speed sensor -G44 - Vehicles with FWD and ABS/EDL/TCS - Vehicles with 4WD and ABS/EDL
3	Rear right speed sensor -G44 - Vehicles with FWD and ABS and ABS/EDL
3	Front right speed sensor -G45 - Vehicles with FWD and ABS/EDL/TCS
4	Front right speed sensor -G45 - Vehicles with FWD and ABS and ABS/EDL - Vehicles with FWD and ABS/EDL/TCS with CAN bus - Vehicles with 4WD and ABS/EDL
5	Front right speed sensor -G45 - Vehicles with FWD and ABS and ABS/EDL - Vehicles with FWD and ABS/EDL/TCS without CAN bus - Vehicles with 4WD and ABS/EDL
6	**Front left speed sensor -G47**
7	**Front left speed sensor -G47**
8	**Rear left speed sensor -G46**
9	**Rear left speed sensor -G46**

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Contact	Wiring to component...
10	Electrical connection to dash panel insert (standing time signal) - Only in vehicles with EDL. This wiring harness transmits the time signals for calculating the "standing time".
11	**K-wire**
13	MAD signal (masking of engine misfire monitoring) - All vehicles with EDL without CAN bus - On vehicles with TCS this wiring harness is also used for transmission of MMS signal (specified engine torque).
14	**Brake light switch -F**
15	**Voltage supply from terminal 15**
16	**Earth, terminal 31 (hydraulic pump -V39)**
17	**Battery + (terminal 30)**
18	**Battery + (terminal 30)**
19	**Earth, terminal 31 (control unit -J104)**
20	TCS lamp -K86 - Vehicles with TCS only
21	**ABS/EDL lamp -K47**
23	Speed sensor output, rear left - In vehicles with navigation system
24	Speed sensor output, rear right. - In vehicles with navigation system

Contact	Wiring to component...
27	MMI (engine torque - actual) - Vehicles with TCS without CAN bus only.
28	GB (gearbox control signal) - Vehicles with TCS without CAN bus only.
29	CAN bus low - The following signals are transmitted via the CAN bus lines to the appropriate control units: MMI (engine torque - actual), MMS (engine torque -specified), GB (gearbox control signal) and engine speed signal.
30	CAN bus high - The following signals are transmitted via the CAN bus lines to the appropriate control units: MMI (engine torque - actual), MMS (engine torque -specified), GB (gearbox control signal) and engine speed signal.
30	Engine speed - Vehicles with TCS without CAN bus only.
31	TCS switch - Vehicles with TCS only

Notes on fault table

- The socket descriptions of test box V.A.G 1598 are identical to the contact descriptions of control unit -J104 in the current flow diagram. Incorrect test procedures can cause system damage. Do not make connections between any contacts other than those listed in the test table.

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

- The specified values refer to the readings obtained on tester V.A.G 1526 and are not necessarily applicable to other test units.
- If the readings obtained do not match the specified values, carry out the fault remedy measures in the right-hand part of the table.

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

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- If the specified values are achieved, also check wiring for loose contacts and short circuit to positive and earth. This applies especially to sporadic faults.
- Only use test lead set V.A.G 1594 for checking continuity (bridging leads).
- If the measured figures only differ slightly from the specified values, clean the sockets and plugs of the testers and test leads (with contact spray G 000 700 04) and repeat the check. Before replacing components, check wiring and connections again. This is particularly important if the specification calls for a resistance reading of less than 10 ω.

Test table

Switch on measuring range: Voltage measurement (20 V =)					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
1	19 + 15	Voltage supply of control unit through terminal 15	▪ Ignition switched on	10.0 - 14.5 V	- Check wiring from contact 19 to earth. Check wiring from contact 15 to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Switch on measuring range: Voltage measurement (20 V =)					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
2	16 + 17	Voltage supply at hydraulic unit -N55 and the motor of the hydraulic pump - V39 through terminal 30 at control unit -J104	▪ Ignition switched on	10.0 - 14.5 V	- Check wiring from contact 16 to earth.
	16 + 18			10.0 - 14.5 V	- Check wiring of contacts 17 and 18 via fuse (60A) to battery + (terminal 30). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Switch on measuring range: Voltage measurement (20 V =)					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
3	19 + 14	Function of brake light switch-F	▪ Ignition switched off		- Check wiring from contact 19 to earth.

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Switch on measuring range: Voltage measurement (20 V =)					
			▪ Brake pedal not operated Brake pedal operated	0.0 - 0.5 V 10.0 - 14.5 V	- Check wiring from terminal 14 via fuse (10A) to terminal 30. Checking brake light switch -F => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Adjust brake light switch -F. => Brake System; Repair group 45

Switch on measuring range: Resistance measurement (2 kω)					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
4	4 + 5 1) 2) 3 + 5 3)	Resistance of speed sensor front right -G45	▪ Ignition switched off	400ω/2300ω	- Test electrical wiring between control unit and speed sensor for open circuit, short to earth or short to positive.
5	6 + 7 (all versions)	Resistance of speed sensor front left -G47			- Check plug connections. Move wiring during check (Loose contact). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If the electrical wiring is OK and the specified value is not obtained, renew the relevant speed sensor.

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1) Assignment of speed sensor contacts on vehicles with FWD and EDL.

2) Assignment of speed sensor contacts on vehicles with 4WD and EDL.

3) Assignment of speed sensor contacts on vehicles with FWD and TCS.

Switch on measuring range: Resistance measurement (2 kω)					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
6	1 + 3 1) 1 + 2 2) 3)	Resistance of speed sensor rear right -G44			- Check electric wiring between control unit and speed sensor for open circuit and short to earth or positive.

Switch on measuring range: Resistance measurement (2 kω)					
7	8 + 9 (all versions)	Resistance of speed sensor rear left -G46	▪ Ignition switched off	400ω/2300ω	- Check plug connections. Move wiring during check (Loose contact). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If the electrical wiring is OK and the specified value is not obtained, renew the relevant speed sensor.

1) Assignment of speed sensor contacts on vehicles with FWD and EDL.

2) Assignment of speed sensor contacts on vehicles with 4WD and EDL.

3) Assignment of speed sensor contacts on vehicles with FWD and TCS.

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Functional check: ABS/EDL warning lamp-K47					
Test step	V.A.G 1598 socket	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
8	-	Function of ABS/ EDL warning lamp - K47.	▪ Fault memory was interrogated and there is no fault present in the fault memory of the control unit -J104. ▪ Ignition switched off ▪ Multi-pin connector connected to control unit -J104 and engaged.		
					Test step 8: Continued on next page.

Functional check: ABS/EDL warning lamp-K47					
Test step	V.A.G 1598 socket	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

Functional check: ABS/EDL warning lamp-K47					
8 Continued:	-	Function of ABS/ EDL warning lamp -K47.	- Switch on ignition.	Warning lamp - K47 is lit up for 2 seconds and then goes out again.	- If ABS/EDL warning lamp does not light check electrical system voltage and wiring from contact 21 of control unit - J104 to dash panel insert for short to earth. ABS/EDL warning lamp does not extinguish after 2 seconds. After 3 seconds the symbol "Fault brake system" illuminates. Check wiring from contact 21 of control unit -J104 to dash panel insert for short to positive and open circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder - If the voltage of the vehicle electrical system is OK and wiring from contact 21 of control unit - J104 to dash panel insert is intact => fault in dash panel insert; LEDs or bulbs defective => Electrical System; Repair group 90

Functional check: Red brake fault symbol					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
9	-	Function of red symbol "Fault brake system"	▪ Brake fluid level OK => Brake System; Repair group 47 ▪ Function of ABS warning lamp -K47 checked in test step 8. ▪ Multi-pin connector connected to control unit -J104 and engaged. ▪ Switch on ignition.		
				Test step 9: Continued on next page.	

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Functional check: Red brake fault symbol

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
9 Continued:		Function of red symbol "Fault brake system"	- Connect V.A.G 1551, select address word 03 On vehicles with automatic gearbox and high-line dash panel insert, press brake pedal and engage a gear.	ABS warning lamp and red brake fault symbol should light up. On vehicles with TCS traction control, TCS warning lamp will also light up if it is working properly.	- Fault in dash panel insert => Electrical System; Repair group 90; Dash panel insert Dash panel insert

Functional check: Warning lamp for TCS -K86 is only present with TCS.					
Test step	V.A.G 1598 socket	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
10	-	Function of TCS warning lamp -K86	▪ Fault memory was interrogated and there is no fault present in the fault memory of the control unit -J104. ▪ Ignition switched off ▪ Multi-pin connector connected to control unit -J104 and engaged.		
				Test step 10: Continued on next page.	

Functional check: Warning lamp for TCS -K86 is only present with TCS.					
Test step	V.A.G 1598 socket	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
10 Continued:	-	Function of TCS warning lamp -K86	- Switch on ignition.	Warning lamp -K86 should light up for 2 seconds and then extinguish.	- If the TCS warning lamp does not light up, check voltage of electrical system and test wiring from contact 20 of control unit -J104 to dash panel insert for open circuit and short to positive. If the TCS warning lamp illuminates continuously, check the wiring from contact 20 of control unit -J104 to the dash panel insert for a short to earth. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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Functional check: Warning lamp for TCS -K86 is only present with TCS.					
					- If the voltage of the vehicle electrical system is OK and wiring from contact 20 of control unit -J104 to dash panel insert is intact => fault in dash panel insert; LEDs or bulbs defective => Electrical System; Repair group 90; Dash panel insert Dash panel insert

Functional check: TCS switch, select measuring range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
11	-	Function of TCS switch	▪ Ignition switched off ▪ Function of TCS warning lamp -K86 checked in test step 10. ▪ Multi-pin connector connected to control unit -J104 and engaged. Switch on ignition.		
			- Operate TCS switch.	TCS warning lamp -K86 illuminates.	- Switch off the ignition. Release multiple connector from control unit -J104 and detach.
			- Press TCS switch again.	TCS warning lamp -K86 goes out.	- Connect test box V.A.G 1598 with adapter cable V.A.G 1598/27.
					Test step 11: Continued on next page.

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Functional check: TCS switch, select measuring range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598 socket**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
11 Continued:	19 + 31	Function of TCS switch	▪ Ignition switched on - TCS switch not pressed	0.0 - 0.5 V	

Functional check: TCS switch, select measuring range on V.A.G 1526: 20 V =					
			- TCS switch pressed	10.0 - 14.5 V	- Check wiring from contact 19 to earth. Check wiring from contact 31 to TCS switch, contact 6. Check voltage supply from contact 5 of TCS switch to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If no fault has been found in the previous test steps, renew TCS switch.

5.8 - Fault table

- Determine test preconditions => Page 6 .
- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03 => Page 1 .
- Check the control unit version => Page 48 and press the ⇒ key.
- Press keys 0 and 2 for "Interrogate fault memory" function and press Q key to confirm entry.

Notes:

- Each fault is assigned a 5-digit fault code. It is listed in the left-hand column of the fault table. The fault message and the fault code will be printed out on the printer of fault reader V.A.G 1551 if the Print key is pressed. The fault code does not appear on the display of V.A.G 1551.
- The content of the fault memory is retained until it is erased. => Page 5 .
- Sporadic faults are additionally indicated by "/SP" on the right of the display.
- Static faults which cannot be detected when the vehicle is stationary are also identified with "/SP" after the ignition has been switched off and then on again.
- The following table includes all the faults which can be detected by the control unit -J104 and displayed and printed out by V.A.G 1551. Faults are listed according to fault codes.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00000 No fault recognised!		
This display means that the self-diagnosis is finished. No faults are stored in the fault memory. If relevant warning lamps light up, in spite of this display appearing, check the following points.	- Voltage supply for control unit -J104 less than 10.0 V at a speed of less than 6 km/h. - Open circuit in wiring for warning lamp -K47 between control unit -J104 and dash panel insert -J218	- Refer to "Warning lamp functions" => Page 45 .
	If no fault can be traced, and the problem continues to exist, there may be a mechanical malfunction (solenoid valve sticking).	- Fault detection must be extended by "Final control diagnosis"=> Page 65 .

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00283		

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
Speed sensor, front left -G47 1) Mechanical fault Or:	- Speed sensor -G47 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G47 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 65 , Test step 5.
Front left speed sensor -G47 Open circuit / short to positive	- Open circuit, short to positive in wiring between speed sensor -G47 and control unit -J104.	- If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new hydraulic control unit.

1) This fault can only be identified during driving

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00285 Speed sensor front right -G45 1) Mechanical fault Or:	- Speed sensor -G45 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G45 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 65 , Test step 4.
Front right speed sensor -G45 Open circuit / short to positive	- Incorrect control unit version - Open circuit, short to positive in wiring between speed sensor -G45 and control unit -J104.	- Check control unit identification => Page 48 . If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new hydraulic control unit.

1) This fault can only be identified during driving

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00287 Speed sensor rear right -G44 1) Mechanical fault Or:	- Speed sensor -G44 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G44 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 65 , Test step 6.
Rear right speed sensor -G44 Open circuit / short to positive	- Incorrect control unit version - Open circuit, short to positive in wiring between speed sensor -G44 and control unit -J104.	- Check control unit identification => Page 48 . If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new hydraulic control unit.

1) This fault can only be identified during driving

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00290		

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
Speed sensor rear left -G46 1) Mechanical fault Or:	- Speed sensor -G46 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G46 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 65 , Test step 7.
Rear left speed sensor -G46 Open circuit / short to positive	- Open circuit, short to positive in wiring between speed sensor -G46 and control unit -J104.	- If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new hydraulic control unit.

1) This fault can only be identified during driving

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00301 ABS return pump -V39	- Fault in hydraulic control unit	- Delete fault memory => Page 5 Switch off the ignition. Switch on ignition. - If the fault occurs again, fit a new hydraulic control unit.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00526 Brake light switch -F Open circuit	- Both brake lights -M9, -M10 defective. - Wiring from brake lights to control unit defective. - Control unit -J104 defective.	- Check brake light switch, "Read measured value block"=> Page 53 , display group 2. Locate and eliminate open circuit in wiring or short circuit. Replace bulbs => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00529 Speed information missing - This fault can only occur on vehicles with TCS Continued next page.	**Data transfer between control unit -J104 and the engine control unit takes place via a single wire.**	Refer to the section "Systems via the TCS" on page 51 .
	- Open circuit or short to positive/ earth in wiring between control unit -J104 and engine control unit.	- Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Engine control unit defective.	- If the rev counter in the instrument cluster is not working, and no fault can be found in the wiring, this means that the engine control unit is defective.

	- Control unit -J104 defective.	- If rev counter in dash panel insert is working and no fault is found in wiring, control unit -J104 is defective.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00529 Speed information missing Continued: - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.**	Refer to the section "Systems via the TCS" on page 51 .
	- The engine control unit cannot make the engine speed signal available to the CAN bus.	- Read out the fault memory of the engine control unit. Eliminate any fault(s) in line with the appropriate engine Workshop Manual and delete the fault memory of the engine control unit. If there are no faults stored in the fault memory of the engine control unit, try replacing the engine control unit.
	- The engine control unit -J104 cannot evaluate the engine speed signal for the CAN bus.	- If the previous attempts at rectifying the fault have been unsuccessful, replace the control unit -J104.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00532 Power supply Signal too low Notes: - This fault affects the voltage supply for the control unit. - This fault is only stored in the memory if it occurs at a road speed above 6 km/h. - The ABS/EDL and TCS system will be switched on again and the warning lamps will extinguish as soon as the supply voltage returns to the required level.	- Open circuit in wiring or excessive contact resistance in voltage supply from terminal 15 to hydraulic control unit, contact 15. - Loss of voltage in electrical system	- Perform "Electrical check" =>Page 65 , Test step 1. Locate and eliminate open circuit in wiring. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Check alternator and voltage regulator. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Test battery => Electrical System; Repair group 27
	- Fault in hydraulic control unit	- If no fault can be found in the voltage supply, fit a new hydraulic control unit.

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00597 Differing wheel speed impulses	- Wheels or tyre sizes not the same on all four wheels	- Check wheels and tyre sizes
	- Rotor dirty or damaged	- Check rotor. => Brake System; Repair group 45
	- Excessive play in wheel bearing	- Check wheel bearing => FWD and 4WD Running Gear; Repair group 40

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
	- Speed sensors -G44, -G45, -G46, -G47 incorrectly installed - Speed sensors -G44, -G45, -G46, -G47 defective.	- Check speed sensors. => Brake System; Repair group 45 65 , Test steps 4 to 7.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00623 ABS/gearbox electrical connection - This fault can only occur on vehicles with TCS	**Data transfer between control unit -J104 and the gearbox control unit takes place via a single wire.**	Refer to the section "Systems via the TCS" on page 51 .
	Manual gearbox	
	- ABS/EDL/TCS control unit -J104 incorrectly coded - Short to positive	- Check encoding of ABS/EDL/TCS-control unit -J104 => Page 51 . Trace and repair short circuit => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	Automatic gearbox	
	- ABS/EDL/TCS control unit -J104 incorrectly coded - Open circuit or short to earth between ABS/EDL/TCS control unit -J104 and automatic gearbox control unit -J217.	- Check encoding of ABS/EDL/TCS-control unit -J104 => Page 51 . Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00646 ABS-TCS/engine electrical connection 1	**Data transfer between control unit -J104 and the engine control unit takes place via a single wire.**	Refer to the section "Systems via the TCS" on page 51 .
Note: The following signals are sent from control unit -J104 to engine control unit via this connection:	- Open circuit or short circuit to positive/earth in wiring between control unit -J104, terminal 13 and engine control unit.	- Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
- MAD signal (masking of engine misfire monitoring) for On Board Diagnostics - MMS signal (engine torque -specified)	- ABS/EDL/TCS control unit -J104 defective.	- Renew ABS/EDL/TCS hydraulic control unit.
- MSR signal (overrun torque reduction)	- Engine control unit defective.	- Renew engine control unit

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00647 ABS-TCS/engine electrical connection 2	**Data transfer between control unit -J104 and the engine control unit takes place via a single wire.**	Refer to the section "Systems via the TCS" on page 51 .

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Note: The following signal is transmitted via this connection from engine control unit to control unit -J104: - MMI signal (engine torque - actual)	- Open circuit or short circuit to positive/earth in wiring between control unit -J104, terminal 27 and engine control unit. - Engine control unit defective. - ABS/EDL/TCS control unit -J104 defective.	- Locate and eliminate open circuit in wiring or short circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder - Renew engine control unit - Renew ABS/EDL/TCS hydraulic control unit.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
00761 Fault stored in engine control unit - This fault can only occur on vehicles with TCS	**Data transfer between control unit -J104 and the engine control unit takes place via a single wire or a CAN bus.** - A fault has been stored in the engine control unit. The engine control unit is not able to reduce engine torque.	Refer to the section "Systems via the TCS" on page 51 . - Read out the fault memory of the engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
01044 Control unit incorrectly encoded - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.** - Control unit -J104 is encoded for a vehicle with a manual gearbox. The vehicle is equipped with an automatic gearbox.	Refer to the section "Systems via the TCS" on page 51 . - Encode control unit -J104 according to the gearbox installed in the vehicle => Page 51 .
01130 ABS operation Implausible signal		- Replace ABS control unit -J104 after consulting the service department of your Regional Sales Centre, or the relevant importer.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
01200		

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
ABS valves supply voltage Note: This fault affects voltage supply of hydraulic unit -N55 and motor of hydraulic pump -V39.	- Open circuit in wiring or excessive contact resistance in voltage supply from terminal 30 to hydraulic control unit, contacts 17 and 18. - Loss of voltage in electrical system	- Perform "Electrical check" =>Page 65 , Test step 2. Locate and eliminate open circuit in wiring. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Check alternator and voltage regulator. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Test battery => Electrical System; Repair group 27
	- Fault in hydraulic control unit	- If no fault can be found in the voltage supply, fit a new hydraulic control unit.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
01201 ABS pump supply voltage Note: This fault affects earth connection of motor of hydraulic pump -V39.	- Open circuit in wiring or excessive contact resistance in earth connection to hydraulic control unit, contact 16.	- Perform "Electrical check" =>Page 65 , Test step 2. Contact resistance in positive supply. Locate and eliminate open circuit in earth connection wiring. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Fault in hydraulic control unit	- If no fault can be found in the voltage supply, fit a new hydraulic control unit.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
01203 ABS/dash panel insert electrical consumer Open circuit/short circuit to earth	- Short to earth or open circuit in wiring between dash panel insert and hydraulic control unit, contact 10.	- Check wiring for short to earth and open circuit => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Fault in dash panel insert	- Check dash panel insert => Electrical System; Repair group 90
No signal	- Short to positive in wiring between dash panel insert and hydraulic control unit, Contact 10.	- Check wiring for short to positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Fault in dash panel insert	- Check dash panel insert => Electrical System; Repair group 90

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
01314 Engine control unit without communications - This fault can only occur on vehicles with TCS Continued next page.	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.**	Refer to the section "Systems via the TCS" on page 51 .
	- Software version of control unit -J104 responsible for CAN bus does not match that of engine control unit.	- Check part numbers of both control units by way of function 01 "Interrogate control unit version" => Page 48 . Refer to parts list and check correct Part No. for vehicle.
	- Fault in engine control unit	- Read out the fault memory of the engine control unit. Eliminate any fault(s) in line with the appropriate engine Workshop Manual and delete the fault memory of the engine control unit.

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
01314 Engine control unit without communications Continued: - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.**	Refer to the section "Systems via the TCS" on page 51 .
	- Fault in bus wiring	- Check bus wires => Page 9
	- CAN bus low and high wires interchanged.	- Check for interchanged wires. The control unit can neither receive or transmit signals if the wires are interchanged. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- The output of one of the control units communicating via the CAN bus is defective.	

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
18034 CAN bus: message missing from gearbox control unit - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.**	Refer to the section "Systems via the TCS" on page 51 .
	- Control unit -J104 is encoded for a vehicle with an automatic gearbox. The vehicle is equipped with a manual gearbox.	- Encode control unit -J104 according to the gearbox installed in the vehicle => Page 51 .
	- Open circuit in one of the Bus lines between control unit -J104 and the gearbox control unit.	- Check bus wires => Page 10 .

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
	- CAN bus low and high wires interchanged.	- Check for interchanged wires. The control unit can neither receive or transmit signals if the wires are interchanged. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
18256 Read fault memory of engine control unit: - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.**	Refer to the section "Systems via the TCS" on page 51 .
	- A fault has been stored in the engine control unit.	- Read out fault memory of engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
18258 CAN bus - no message from engine control unit - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.**	Refer to the section "Systems via the TCS" on page 51 .
	- A fault has been stored in the engine control unit.	- Read out fault memory of engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.
	- Fault in bus wiring	- Check bus wires => Page 10
	- CAN bus low and high wires interchanged.	- Check for interchanged wires. The control unit can neither receive or transmit signals if the wires are interchanged. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- The output of one of the control units communicating via the CAN bus is defective.	

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
18262 CAN bus hardware defective - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104, engine control unit and gearbox control unit via CAN bus.**	- Check bus wires => Page 10 .

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
	- Fault in bus wiring Control units are not able to communicate.	- Check bus wires => Page 10 .

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
18263 Monitoring of CAN bus software status - This fault can only occur on vehicles with TCS	**Data transferred between control unit -J104, engine control unit and gearbox control unit via CAN bus.** - Software version of control unit - J104 responsible for CAN bus does not match that of engine control unit.	- Check bus wires => Page 10 . - Check part numbers of both control units by way of function 01 "Interrogate control unit version" => Page 48 . Refer to parts list and check correct Part No. for vehicle.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
18265 Load signal - fault message from engine control unit - This fault can only occur on vehicles with TCS	**Data transfer through the engine control unit takes place via a CAN bus.** - A fault has been stored in the engine control unit.	- Check bus wires => Page 10 . - Eliminate the fault in the engine management system in line with the appropriate engine Workshop Manual and delete the fault memory of the engine control unit.

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
18266 Engine speed from engine control unit - fault message from engine control unit - This fault can only occur on vehicles with TCS	**Data transfer through the engine control unit takes place via a CAN bus.** - A fault has been stored in the engine control unit.	- Check bus wires => Page 10 . - Eliminate the fault in the engine management system in line with the appropriate engine Workshop Manual and delete the fault memory of the engine control unit.

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Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
65535		

Fault code V.A.G 1551 printer	Possible causes of fault	Fault remedy
Control unit	- Control unit defective	- Replace control unit. In this case the fault memory is not to be erased. The data stored in the fault memory aid the detection of the damage in the control unit. This data is used for the continuous improvement of the product.

6 - ESP, Electronic-Stability-Program Bosch 5.3

6.1 - ESP, Electronic-Stability-Program Bosch 5.3

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6.2 - Description of sender and ESP system components

Control unit for ABS with EDL/TCS/ESP -J104

The control unit is combined with the hydraulic unit to form an assembly group. It controls ESP, ABS, EDL, TCS, EBPD and overrun torque limiting function. A control unit self test is performed on switching on the ignition. All electrical connections are permanently monitored and the solenoid valve function is tested periodically. The normal braking system only is available on total failure of the control unit.

Steering angle sender -G85

The steering angle sender is fitted in a joint housing with the airbag coil connector. It is located on the steering column between steering column switch and steering wheel. It sends the steering angle lock of the steering wheel via the CAN bus to the ABS/TCS/ESP control unit -J104. Zero position compensation must be performed after replacement of the control unit or the sender. The ESP function fails if the sender is defective.

Lateral acceleration sensor -G200

The lateral acceleration sender sends the cornering force values to the ABS/TCS/ESP control unit -J104. The ESP function fails if the sender is defective.

Yaw rate sender -G202

The yaw rate sender records data, called yaw rates, which attempt to rotate the vehicle about its vertical axis and sends them to the ABS/TCS/ESP control unit -J104. The ESP function fails if the sender is defective.

Brake pressure sender -G201

The brake pressure sender records the current brake pressure in the brake circuit and sends it to control unit -J104. The control unit uses this to calculate the wheel brake forces and the longitudinal forces acting on the vehicle. The ESP function fails if the sender fails.

Switch for TCS/ESP E256

The switch enables the driver to switch off the ESP function. Pressing the brake pedal or pressing the switch again switches it back on. If it has not been switched on again, the system reactivates itself automatically when the engine is next switched on. The system cannot be switched off during a current ESP operation and after a certain speed has been reached.

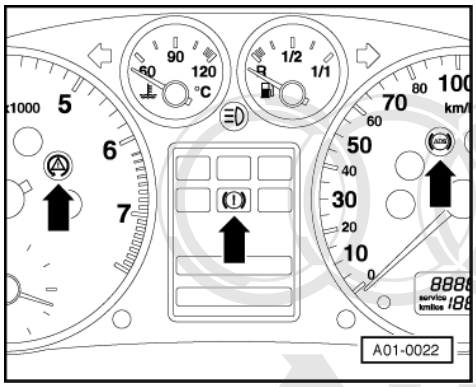
Switch for brake recognition -F83

The brake recognition switch is also known as a release switch and operates like a two-way switch When the driver brakes, the switch changes from signal contact 1 to signal contact 2. Since there is always only one signal contact closed, the system can clearly identify the current status, thus the release switch provides a high degree of intrinsic safety.

ESP hydraulic pump V156

To generate the necessary admission pressure on the suction side of the return pump, a hydraulic pump is also required. The pre-charge pressure is limited by a restrictor in the main cylinder, hydraulic pump V156 itself is not regulated.

6.3 - Table of warning lamp functions



- If the self-diagnosis function detects a fault in the system, this will be indicated (with ignition on) by the warning lamps in the dash panel insert. The warning lamps are in the dash panel insert.

-> Dash panel insert without FIS

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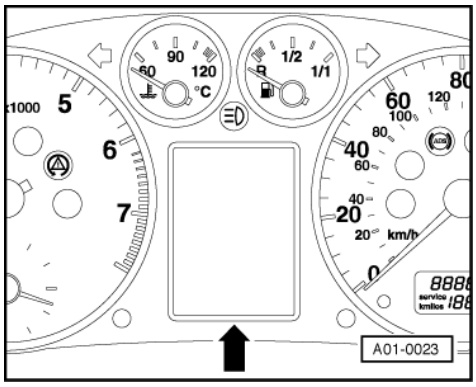
- The diagram shows the warning lamps for ABS/EDL -K47 (right arrow), brake system warning lamp -K118 (centre arrow, red brake fault symbol) and TCS warning lamp -K86 (left arrow).

-> Dash panel insert with FIS



- The warning lamp -K118 is not supplied with FIS. The red brake fault symbol appears in the display.
- If the brake system is not fully functional, but the ABS/EDL warning lamp -K47 and the red brake fault symbol do not light up, this means the fault must be sought in the conventional braking system (mechanical/hydraulic components)

=> Brake System; Repair group 46

=> Brake System; Repair group 47

Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating
off	off	off	- All warning lamps off after self test (approx. 3 seconds after switching on ignition). All systems OK. - Please also refer to the notes on the next page.

Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating
off	off	flashes	- TCS/ESP active. TCS/ESP Warning lamp flashes roughly 3 times a second.

Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating
off	on	on	Self test is performed after switching on ignition. If all systems are OK warning lamps -K47 and -K86 extinguish after approx. 3 seconds. If warning lamps do not light up, test the corresponding warning lamps; => Perform "Electrical check", Test steps 17 and 19Failure to light may be due to the following: - Inadequate battery voltage. None of the warning lamps in the dash panel insert light. Check the battery. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder => Electrical System; Repair group 90 - If the ABS/EDL warning lamp K47 does not light up during the self-test phase: Short to earth in wiring from contact 32 of control unit -J104 to dash panel insert (actuation of ABS/EDL warning lamp). Fault does not affect actuation of TCS/ESP warning lamp. - TCS/ESP warning lamp -K86 does not light during self test; => Perform "Electrical check", Test step 19. - This fault does not affect the actuation of ABS/EDL warning lamp.

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Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating
off	off	off	- Problem with vehicle. The warning lamps light during the self test and then extinguish normally. The fault may be caused by the following conditions: - The voltage supply of control unit -J104 is between 7 and 10 V and the vehicle speed is < 6 km/h. Perform "Electrical check", Test step 21. - The fault "01119 Gear recognition signal" is stored in the fault memory. Interrogate fault memory => Page 101 .

Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating

off	on	on	- Warning lamps do not extinguish after self test. Red brake fault symbol does not light. Fault detected by self-diagnosis resulting in deactivation of ABS/EDL/TCS/ESP. Electronic brake pressure distribution function still active. Interrogate fault memory => Page 95 - Check actuation of red brake fault symbol. Perform "Electrical check", Test step 18. If actuation is defective refer to net example of warning lamps lighting. - A dynamic speed sensor fault or a fault in ABS return pump -V39 was present during the last driving cycle. In this case the warning lamps will extinguish automatically after the vehicle is restarted, provided the vehicle reaches a speed above 2.75 km/h or the return pump is OK. Please also refer to the notes on the next page.

Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating
off	on	on	Continued from previous page. - If the supply voltage of control unit -J104 is between 7 and 10 V the warning lamps will light up and a fault will be stored in the memory when road speed exceeds 6km/h for the first time after the ignition is switched on. If the supply voltage of control unit -J104 reaches a value above 10 V while the vehicle is moving, the warning lamps will extinguish. The fault will remain in the fault memory. "Interrogate fault memory" =>Page 95

Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating

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on	on	on	ABS/EDL and TCS/ESP lamps come on and red braking fault symbol also lights 3 seconds after switching on ignition. - Fault has resulted in deactivation of ABS/EDL, TCS/ESP and electronic brake pressure distribution function. - Interrogating fault memory => Page 135 . Important The function of the brake system is impaired. The brake pressure at the rear wheels is no longer controlled by the electronic brake force distribution function. This can result in the breaking away of the rear of the vehicle and thus cause accidents. Note:On vehicles with an automatic gearbox the red brake fault symbol does not appear immediately after the ignition is switched on. The driver instruction "Apply foot brake when selecting gear with vehicle stationary" is given priority. Operate the foot brake and engage a gear. If the actuation of the red brake fault symbol is OK, the symbol will now light up.

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Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating
off	off	on	TCS/ESP lamp does not extinguish after self test. - A fault in the system affecting only the TCS/ESP. The ABS/EDL and EBPD systems are not switched off. Interrogate fault memory => Page 135 . - The TCS/ESP has been switched off with the TCS/ESP switch. - If TCS/ESP warning lamp does not light up in this case, check switch and warning lamp, Perform "Electrical check", Test steps 19 and 20. - Short to positive in TCS/ESP switch: The TCS/ESP warning lamp will extinguish 5 minutes after the ignition is switched on. Perform "Electrical check", Test step 20. - Short to earth in wiring from contact 31 of control unit -J104 to dash panel insert (actuation of TCS/ESP warning lamp). Perform "Electrical check", Test step 19.

Brake warning symbol	ABS/EDL warning lamp -K47	TCS/ESP warning lamp -K86	Possible reasons for warning lamps illuminating

on	on	off	- No faults are stored in the fault memory.The ABS/EDL lamp does not extinguish after the self-test and the red brake fault symbol lights approx. 3 seconds after switching on ignition. - Open circuit or short to positive in wiring from contact 32 of control unit -J104 to dash panel insert (actuation of ABS/EDL warning lamp); => Perform "Electrical check", Test step 17. - Control unit voltage supply less than 7 V; => Perform "Electrical check", Test step 21.
on	off	off	No faults are stored in the fault memory. The red brake fault symbol illuminates continuously after the ignition is switched on. - Brake fluid level too low - Fault in dash panel insert: Perform "Electrical check", Test step 18.

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6.4 - Interrogating control unit version

- Connect vehicle diagnostic, testing and information system VAS 5051/fault reader V.A.G 1551 and select "Brake electronics" with address word 03.

Note:

The following explanatory notes on implementation of self-diagnosis relate to the fault reader V.A.G 1551. The self-diagnosis procedure when using the vehicle diagnostic, testing and information system VAS 5051 is similar.

- Go back to the initial settings of the program by pressing the ⇒ key:

-> Indicated on display:

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

- Press keys 0 and 1 for the function "Interrogate control unit version" and confirm entry with Q key.

Note:

- Refer also to spare parts list for assignment of control unit -J104.

-> Indicated on display:

```
8D0 907 389E 1)     ABS/ESP four-wheel
drive 2)     D01 3)
Code 06397     WSC xxxxx
```

Index 1): Indicates part no. with control unit index.

Index 2): Indicates the system designation.

Index 3): Indicates hardware and software status.

Control unit versions

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	CAN terminating resistor in control unit:
4WD; ABS/ESP	1AT	4B0 907 389	-	Not encodable	CAN bus	120 ω

System designation	Pr. no. 1)	Control unit part no.:	Index	Encoding	Data transfer via:	CAN terminating resistor in control unit:
FWD; ABS/ESP	1AT	8D0 907 389	-	encodable	CAN bus	120 ω
4WD; ABS/ESP	1AT	8D0 907 389	A	encodable	CAN bus	120 ω
FWD; ABS/ESP	1AT	8D0 907 389	D	encodable	CAN bus	2600 ω
4WD; ABS/ESP	1AT	8D0 907 389	E	encodable	CAN bus	2600 ω

1) This letter combination is the production number which is allocated to each equipment variation. Production number can also be found on vehicle data sticker. The sticker is in the spare wheel well.

6.5 - Encoding control unit

After installation of a new control unit -J104 or a new steering angle sensor -G85 the ESP system must be encoded again. After encoding the steering angle sensor compensation must be performed.

Encoding of ESP control unit is designed to adapt the control unit to the vehicle.

Zero position compensation must then be performed for steering angle sender -G85.

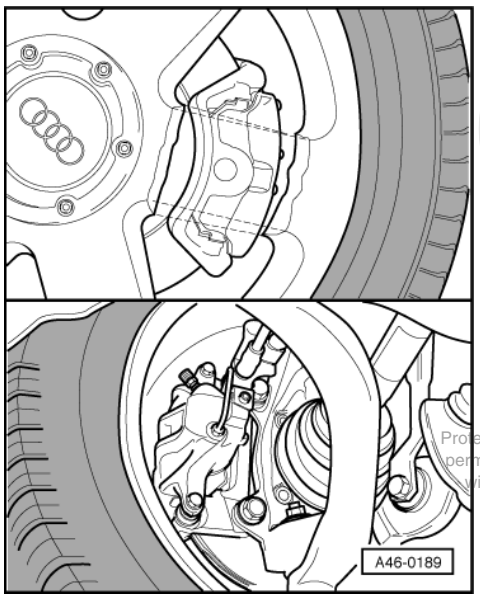
Coding is only possible after the workshop code (WSC) has been entered into V.A.G 1551.

Note:

If control unit has been encoded with code 00000 or with a code not appropriate to the vehicle the ABS warning lamp (K47) and the TCS/ESP warning lamp (K86) will light up continuously and the fault 01044-Control unit incorrectly codedwill be stored in the fault memory of the control unit.

The brake caliper type must be determined in order to perform the login procedure and the encoding (see illustrations below).

Brake caliper type (front)



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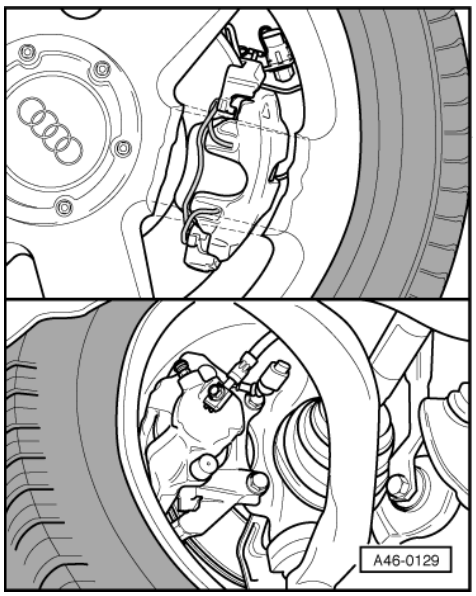
- -> Diagram shows the brake type C54 from Lucas



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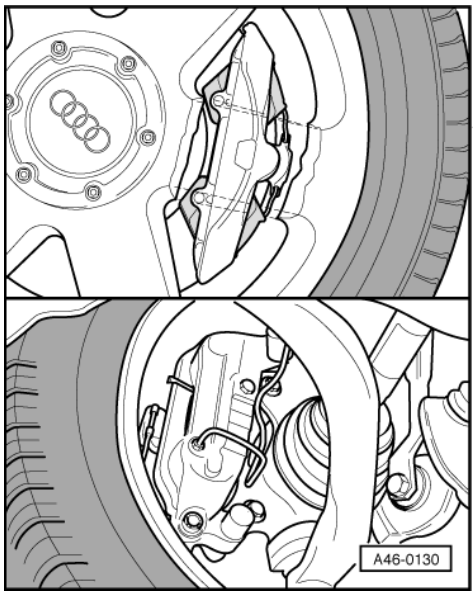
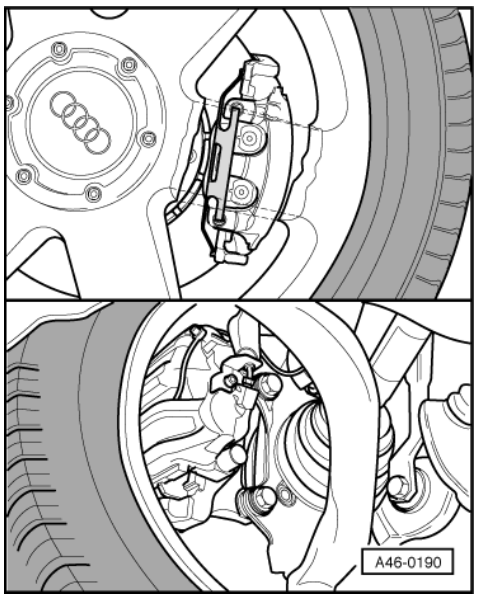
- -> Diagram shows the Teves/Ate brake type FN3 (Distinguishing feature: clamp on brake carrier).



- -> Diagram shows the brake type HP2 from Lucas (Distinguishing feature: twin piston housing).



- -> Diagram shows the Teves/Ate brake type FN3 (Distinguishing feature: clamp on brake carrier).

Perform login

- Connect vehicle diagnostic, testing and information system VAS 5051/fault reader V.A.G 1551 and select "Brake electronics" with address word 03.

-> Indicated on display:

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

- Press 1 twice to select the function "Login procedure".

-> Indicated on display:

```
Rapid data transfer      Q
11 - Login procedure
```

- Confirm input with Q key.

-> Indicated on display:

```
Login procedure     Q
Enter code number XXXXX
```

- Enter code number as per following table and confirm with Q key.

ESP login code table

Type of engine	Gearbox version	Brake caliper type (front)	Login code
4 cyl. petrol engine	Manual gearbox	C54 Lucas	09675
4 cyl. petrol engine	Manual gearbox	FN3 Teves/ATE	09575
4 cyl. petrol engine	Automatic gearbox	C54 Lucas	09677
4 cyl. petrol engine	Automatic gearbox	FN3 Teves/ATE	09577
6 cyl. petrol engine	Manual gearbox	FN3 Teves/ATE	09595
6 cylinder turbo engine	Manual gearbox	FN 2/ HP2 double piston brake caliper	09495
6 cyl. petrol engine	Automatic gearbox	FN3 Teves/ATE	09597
6 cyl. petrol engine	Automatic gearbox	HP2 double piston brake caliper	09497
4-cylinder diesel engine	Manual gearbox	C54 Lucas	09655
4/6 cyl diesel engine	Manual gearbox	FN3 Teves/ATE	09555

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Type of engine	Gearbox version	Brake caliper type (front)	Login code
4-cylinder diesel engine	Automatic gearbox	C54 Lucas	09677
4/6 cyl diesel engine	Automatic gearbox	FN3 Teves/ATE	09557

Encoding control unit

- Check the control unit version and press the ⇒ key.

-> Indicated on display:

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

- Press keys 0 and 7 for "Coding control unit" function.

-> Indicated on display:

```
Rapid data transfer      Q
07 - Coding control unit
```

- Confirm input with Q key.

-> Indicated on display:

```
Code control unit     Q
Enter code number      XXXX
```

- Enter code number as per following table and confirm with Q key.

ESP coding table

Type of engine	Gearbox version	Brake caliper type (front)	Coding
4 cyl. petrol engine	Manual gearbox	C54 Lucas	04175
4 cyl. petrol engine	Manual gearbox	FN3 Teves/ATE	04275
4 cyl. petrol engine	Automatic gearbox	C54 Lucas	04177
4 cyl. petrol engine	Automatic gearbox	FN3 Teves/ATE	04277
6 cyl. petrol engine	Manual gearbox	FN3 Teves/ATE	04295
6 cylinder turbo engine	Manual gearbox	FN 2/ HP2 double piston brake caliper	04395
6 cyl. petrol engine	Automatic gearbox	FN3 Teves/ATE	04297
6 cyl. petrol engine	Automatic gearbox	HP2 double piston brake caliper	04397
4-cylinder diesel engine	Manual gearbox	C54 Lucas	04155
4/6 cyl diesel engine	Manual gearbox	FN3 Teves/ATE	04255
4-cylinder diesel engine	Automatic gearbox	C54 Lucas	04177
4/6 cyl diesel engine	Automatic gearbox	FN3 Teves/ATE	04257

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-> The display on fault reader V.A.G 1551 shows the control unit identification code e.g.: 8D0 407 389D ABS/ ESP front-wheel drive.

```
8D0 407 389D ABS/ESP     front-wheel
drive     D16
Code 06255     WSC XXXXX
```

- Press ⇒ key.

6.6 - Steering angle sender -G85 zero position compensation

- Zero position compensation with the steering angle sender G-85 must now be performed.
- To initialise steering angle sender, turn steering wheel at least 10 degrees in any direction

- Move steering to zero position. Maximum tolerance ± 5 degrees

Note:

The diagnosis must not be terminated nor the ignition switched off between the procedures "Encoding control unit" and "Steering angle sensor compensation". Otherwise the entire process would have to be repeated.

-> Indicated on display:

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

- Press 1 twice to select the function "Login procedure".

-> Indicated on display:

```
Rapid data transfer      Q
11 - Login procedure
```

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- Confirm input with Q key.

-> Indicated on display:

```
Login procedure     Q
Enter code number XXXXX
```

- Enter code number 40168 and confirm entry with Q key.

-> Indicated on display:

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

- Press keys 0 and 4 to select function "Basic setting".

-> Indicated on display:

```
Rapid data transfer      Q
04 - Basic setting
```

- Confirm input with Q key.

-> Indicated on display:

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

- Press keys 0, 0 and 1 and confirm entry by pressing Q.

-> If this display appears, this means the function "Login procedure" has not been performed successfully.

```
Function unknown or cannot
be carried out at present.
```

-> Indicated on display:

```
System in basic setting      1
Steer. angle sender compens.     OK
```

- Check zero position using function 08 "Read measured value block", display group 5,

Or:

-> Indicated on display:

```
System in basic setting      1
Steer. angle sender compens.     not OK
```

- Interrogating fault memory
- Erase fault memory
- Switch ignition off.
- Switch the ignition on.

- Perform zero position compensation again.
- Go back to the initial settings of the program by pressing the ⇒ key:

-> Indicated on display:

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

Or:

-> Indicated on display:

```
System in basic setting      1
Steer. angle sender compens.     Disabled
```

If initialising the steering wheel has not been carried out, the steering wheel must be turned at least 10 degrees in any direction.

- Switch ignition off.
- Switch the ignition on.
- Perform zero position compensation again.
- Go back to the initial settings of the program by pressing the ⇒ key:

-> Indicated on display:

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

6.7 - ESP Driving and system test

The ESP system test is used to check the plausibility of the signals from the lateral acceleration, yaw rate and pressure senders.

Road test

Certain faults are only detected by the self-diagnosis when the vehicle is moving. The entire system can be tested by carrying out a test drive. Maintain a speed above 60km/h for a period of 30 seconds. Observe the traffic conditions and perform a braking controlled by the ABS. The control can be felt by a pulsing sensation at the brake pedal.

Note:

Once the ESP system test has been started it cannot be terminated and must be completed. After exiting the diagnosis, the ABS/EDL and TCS/ESP lamps remain on, to show that the test is active and the system function is temporarily unavailable. Warning, ABS and ESP are not working!

Important
The ABS/ESP/EPBD are not active whilst the system is being diagnosed.
If the vehicle is driven after a fault has been detected through self-diagnosis there is the danger of an accident! The function of the brake system will be impaired. As the brake pressure is no longer controlled by the electronic brake force distribution the rear wheels tend to break excessively. Due to this the rear of the vehicle may break away unexpectedly.
If test and measuring instruments are required during a test drive, these must always be secured to the rear seat and operated by a second person from this position.
If the test equipment is operated from the front passenger seat, the person sitting there could be injured if the front passenger airbag were triggered in the event of an accident.

- Connect vehicle diagnostic, testing and information system VAS 5051/fault reader V.A.G 1551 and select "Brake electronics" with address word 03 => Page 01 -5

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-> Indicated on display:

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

- Press keys 0 and 4 to select function "Basic setting".

-> Indicated on display:

```
Rapid data transfer      Q
04 - Basic setting
```

- Confirm input with Q key.

-> Indicated on display:

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

- Press keys 0, 0 and 3 and confirm entry by pressing Q.

-> Indicated on display:

```
System in basic setting      3
System test activated     OK
```

ESP system test activated.

ABS/EDL -K47 and TCS/ESP -K86 warning lamps light.

- Press keys 0 and 6 for the "End output" function and press the Q key to confirm entry.

-> Indicated on display:

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

- Disconnect fault reader V.A.G 1551.
- Start the engine.
- Press brake pedal firmly (brake pressure of more than 35 bar) until TCS/ESP warning lamp -K86 goes out.

Calibration with vehicle stationary is thus completed.

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- Then perform drive test as follows:

Note: Safety is always the top priority. Take care to comply with road traffic regulations and ensure that due regard is given to the prevailing traffic conditions.

- Negotiate a right or left bend. Then change direction and continue driving until the ABS/EDL lamp goes out.

Note:

A yaw rate of approx. 10 °/s must be attained when cornering. This is achieved for example by negotiating a bendwith a radius of 10...12 m at a speed of 15...20 km/h for approx. 4 seconds.

- ABS/ESP warning lamp -K47 should extinguish to indicate that ESP system test is over and system is OK.
- If the ABS/ESP warning lamp -K47 remains on, the test is not OK (system blocked). Read out fault memory.

- If ABS/EDL warning lamp -K47 does not go out ESP system test has not been implemented properly.
- If ABS/EDL warning lamp -K47 does not go out and TCS/ESP warning lamp -K86 lights up again the system is faulty; Interrogate fault memory, => Page 01-281

Note:

If the ESP system test is terminated, for example by switching off the ignition it must be repeated in full.

6.8 - Reading measured value block

The control unit can transfer measured values to the vehicle diagnostic, testing and information system VAS 5051 and fault reader V.A.G 1551. This test data delivers information about the condition of the system and the sensors connected. In many cases the transferred test data can be used to support the fault finding and remedy. The ESP measured values are arranged in six display groups which can be selected via display group numbers.

- Connect vehicle diagnostic, testing and information system VAS 5051/fault reader V.A.G 1551 and select "Brake electronics" with address word 03.

Notes:

- When the printer is switched on, the contents of the display will be printed out on the fault reader log.
- When "Read measured value block", also check wiring and connectors for loose contacts.

- Check the control unit version => Page 89 and press the ⇒ key.

-> Indicated on display:

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

- Press keys 0 and 8 for "Read measured value block" function.

-> Indicated on display:

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

- Confirm input with Q key.

-> Indicated on display:

```
Read measured value block      Help
Enter display group number     XXX
```

- Press keys 0, 0 and 1.
- Confirm input with Q key.

Test table, display group 1

- The display zones 1 to 4 show the actual wheel speeds at the tyre circumference in km/h. These are calculated by control unit -J104 on the basis of the pulses received from the wheel speed sensors. If one of the display zones shows no reading, proceed as for fault codes 00283, 00285, 00287, 00290 "Speed sensor". Fault table => Page 136 .
- In order to check that the speed sensor signals are correctly assigned to the four wheels, the vehicle must be raised. On vehicles with manual gearbox put the gear lever in neutral. On vehicles with automatic gearbox move the selector lever to position "N". Turn appropriate wheel by hand. The other wheels must be prevented from rotating.
- When the vehicle is accelerated uniformly on a dry surface, the displayed values will increase continuously in rising whole numbers, e.g.... 6 km/h, 7km/h, 8 km/h.... The difference between displayed values 1 to 4 should be no more than ±1 km/h(rounding errors).If the values jump, for instance from... 6km/h, 7km/h, to 12 km/h... or if the difference between the displayed values is greater than ±1 km/h then check the installation of the wheel speed sensors and rotors.

=> Brake System; Repair group 45

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Test table, display group 1

Reading measured value block			1 ⇒	◂ Indicated on display
1 ... 19 1) km/h	1 ... 19 1) km/h	1 ... 19 1) km/h	1 ... 19 1) km/h	
Wheel speed, rear right				

Wheel speed, rear left
Wheel speed, front right
Wheel speed, front left

1) Control unit -J104 terminates self-diagnosis if speed exceeds 19 km/h. The lowest available speed is 1 km/h, i.e. at a speed of 0 km/h the test display 1 km/h.

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551, or arrow keys ↑ and ↓ on V.A.G 1552 or arrow keys ↑ and ↓ on monitor of vehicle diagnostic, testing and information system VAS 5051.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

- Press keys 0, 0 and 2.
- Confirm input with Q key.

Test table, display group 2

Reading measured value block			2 ⇒	◂ Indicated on display
0 or actuated	0 or actuated	0 or actuated	0 or actuated	
			TCS/ESP switch - 0 ⇒TCS/ESP switch not operated - TCS/ESP switch operated Check TCS/ESP switch in the event of deviation. Perform "Electrical check", Test step 20.	
		Handbrake - 0 ⇒ Handbrake not operated - Handbrake applied		- Check handbrake warning switch - F9 in the event of deviation Perform "Electrical check", Test step 27.
	Brake light switch: - 0 ⇒ Brake pedal not operated - Brake pedal depressed			- Check brake light switch in the event of deviation. Fault table => Page 135 ; Fault "Brake light switch-F"; fault code 00526.
Brake test switch - 0 ⇒ Brake pedal not operated - Brake pedal depressed			- The brake test signal comes before the brake light signal. In the event of deviation check brake light switch: Fault table => Page 135 ; Fault "Brake light switch-F"; fault code 00526.	

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551, or arrow keys ↑ and ↓ on V.A.G 1552 or arrow keys ↑ and ↓ on monitor of vehicle diagnostic, testing and information system VAS 5051.

- Press key C in order to enter the display group number manually.

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-> Indicated on display:

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

- Press keys 0, 0 and 3.
- Confirm input with Q key.

Note for display group 3:

If display zones for engine speed and actual engine torque are to be read out with engine running communication between fault reader and control unit must be terminated with "End output" function => Page 5 . Then start engine and set up diagnostic link between fault reader and control unit again.

-> Indicated on display:

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

- Press keys 0 and 8 for "Read measured value block" function.
- Confirm input with Q key.

-> Indicated on display:

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

- Press keys 0, 0 and 3.
- Confirm input with Q key.

Test table, display group 3

Reading measured value block			3 ⇒	◂ Indicated on display
60 ... 8000 rpm	0 ... 630 Nm	0 ... 630 Nm	0 ... 100 %	
			Throttle valve angle: If no display appears press C key select function 02 and interrogate fault memory. Repair fault according to fault table => Page 135 .	
		Torque loss: If no display appears press C key select function 02 and interrogate fault memory. Repair fault according to fault table => Page 135 .		
	Engine torque: If no display appears press C key select function 02 and interrogate fault memory. Repair fault according to fault table => Page 135 .			
Engine speed: - The display indicates engine speed in steps of 60rpm, starting at 60rpm. If no display appears press C key select function 02 and interrogate fault memory. Repair fault according to fault table => Page 135 .				

If the vehicle exceeds a speed of 19 km/h then control unit -J104 aborts the self-diagnosis.

Subtracting torque loss from engine torque yields actual engine torque (MMI).

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551, or arrow keys ↑ and ↓ on V.A.G 1552 or arrow keys ↑ and ↓ on monitor of vehicle diagnostic, testing and information system VAS 5051.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

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- Press keys 0, 0 and 4.
- Confirm input with Q key.

Note on test table: display group 4

Display group number 4 is not used with control unit no. 4B0 907 389(no index) and can neither be selected by pressing keys <-1 and 3-> on V.A.G 1551 nor by pressing the arrow keys ↑ and ↓ on V.A.G 1552, nor by means of any other manual input.

If an attempt is made to select display group number 4, the display indicates:

-> Indicated on display:

```
Function unknown or cannot
be carried out at present.
```

- Press ⇒key.

-> Indicated on display:

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

To avoid exit from "Read measured value block" function display group number 4 must be bypassed by pressing key C and selecting display group number 3 or 5 directly.

Test table, display group 4

Reading measured value block			4 ⇒	◂ Indicated on display
12:00 AM h or Not valid	off/on	Not used	Not used	

EDL deactivation
- Electronic differential lock (EDL) only is switched off if brake temperature is excessive (display on).

Standing time (TIM):
- Standing time (TIM) is required to allow for cooling of brakes with ignition off; control unit J104 receives standing time signal from dash panel insert.

If no display appears press C key select function 02 and interrogate fault memory. Repair fault according to fault table => Page 135 .

Not valid:
- For disconnected or drained vehicle batteries
- Open circuit from control unit -J104 to dash panel insert

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If the vehicle exceeds a speed of 19 km/h then control unit -J104 aborts the self-diagnosis.

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551, or arrow keys ↑ and ↓ on V.A.G 1552 or arrow keys ↑ and ↓ on monitor of vehicle diagnostic, testing and information system VAS 5051.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

- Press keys 0, 0 and 5.
- Confirm input with Q key.

Note for display group 5:

If display zones for yaw rate and lateral acceleration are to be read out with engine running communication between fault reader and control unit must be terminated with "End output" function => Page 5 . Then start engine and set up diagnostic link between fault reader and control unit again.

-> Indicated on display:

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

- Press keys 0 and 8 for "Read measured value block" function.

- Confirm input with Q key.

-> Indicated on display:

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

- Press keys 0, 0 and 5.
- Confirm input with Q key.

Test table, display group 5

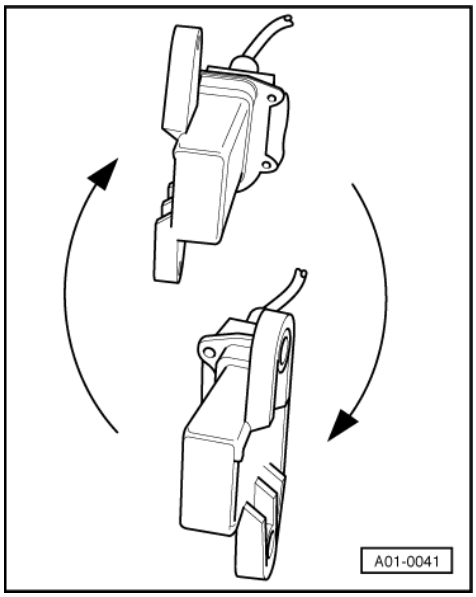
Reading measured value block			5 ⇒	◂ Indicated on display
- 720 °... +720 °	- 69 °/s... + 69 °/s	- 41 bar... +292 bar	- 25 m/s2... + 25 m/s2...	
			Lateral acceleration: - Specified value with vehicle stationary: ±0....0.7 m/s2 - Specified value (steering at full lock and road speed 20 km/h): max. ±6.0 m/s2; measured value increases steadily. - For additional testing of this sensor refer to page 102 ; Fig. 1 .	
		Brake pressure: - Specified value with brake not pressed: ± 0...5 bar		
	Yaw rate: - Specified value with vehicle stationary: ± 3 °/s - Specified value with full steering lock and speed of max. 20 km/h: max. ±65 °/s; measured value increases steadily.			
Steering angle: - Specified value when driving straight ahead (steering wheel in straight-ahead position) ± 5°.1)				

1) If the steering angle sensor is OK, there is a display even if no zero position compensation has been performed.

Note:

If the vehicle exceeds a speed of 19 km/h then control unit -J104 aborts the self-diagnosis.

If no display appears press C key select function 02 and interrogate fault memory. Repair fault according to fault table => Page 135 .



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Note:

Lateral acceleration sender and combined yaw rate/lateral acceleration sender are extremely sensitive to impact. Should sensor be dropped it is never to be reinstalled. In this case always use a new one.

-> Fig.1 Lateral acceleration sensor -G200

Checking of sender/combined yaw rate and lateral acceleration sender involves removing sender. Take out the rear seat bench. Unscrew bolts and detach control unit for ultra-sonic sensors -J347 and then the sensor.
Leave the connector plugged in, and turn the sensor 90° about its longitudinal axis in relation to its normal installation position.

This should give a reading of - 9.8 ± 1 m/s2 or + 9.8 ± 1 m/s2 which can be read out via display group 5, function "Read measured value" on display of fault reader.
A positive (+) reading will be indicated when the sensor is subjected to acceleration in a left-hand corner.
A negative (-) reading will be indicated when the sensor is subjected to acceleration in a right-hand corner.
Following installation tighten bolts securing sender -G200/combined yaw rate and lateral acceleration sender to 5 Nm. The bolts securing control unit -J347 must be tightened to 2 Nm.

Note:

Due to a fault in tester card 8.0 for fault reader V.A.G 1551 and tester card 5.0 for fault reader V.A.G 1552, the value displayed when reading out measured value block 5, display group 4, is wrong by a factor of 10. For example, a lateral acceleration of 9.81m/s2 is only displayed as 0.98 m/s2.

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551, or arrow keys ↑ and ↓ on V.A.G 1552 or arrow keys ↑ and ↓ on monitor of vehicle diagnostic, testing and information system VAS 5051.

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- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

- Press keys 0, 0 and 6.
- Confirm input with Q key.

Test table, display group 6

Reading measured value block			6 ⇒	◂ Indicated on display
0 V ... 18 V	On or off	On or off	0 ... 131071	
			Workshop code: - Workshop code identifies workshop which last performed function 11 "Login procedure" under address word 03 "Brake electronics", => Page 92 . - If no display appears "Login procedure" has not as yet been performed under address word 03 "Brake electronics".	
		Voltage at return pump motor: - OFF ⇒ specified value; no voltage applied to return pump motor. - ON⇒Not permissible during "Read measured value block" function; voltage applied to return pump motor. Perform "Electrical check" Test steps 12, 23 and 24.		
	Solenoid valve relay: - ON ⇒ Specified value; relay actuated by control unit -J104 when ignition switched on. - OFF ⇒ Not permissible during "Read measured value block" function; relay not actuated when ignition switched on. Perform "Electrical check" Test steps 11 and 22.			

Supply voltage of control unit -J104 at contact 1:
- Specified value: 10.5 - 14.5 V
If specification is not attained, perform "Electrical check" Test step 21.

Display group numbers can be selected in sequence by pressing keys <-1 and 3-> on V.A.G 1551, or arrow keys ↑ and ↓ on V.A.G 1552 or arrow keys ↑ and ↓ on monitor of vehicle diagnostic, testing and information system VAS 5051.

- Press key C in order to enter the display group number manually.

-> Indicated on display:

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

- Press keys 1, 2 and 5.
- Confirm input with Q key.

Note on test table: display group 125

Display group number 125 is not used on control unit no. 4D0 907 389 and can neither be selected by pressing keys <-1 and 3-> on V.A.G 1551 nor by pressing the arrow keys = and O on V.A.G 1552, nor by means of any other manual input.

If an attempt is made to select display group number 125, the display indicates:

-> Indicated on display:

```
Function unknown or cannot
be carried out at present.
```

- Press ⇒key.

-> Indicated on display:

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

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Test table, display group 125

Reading measured value block			125 ⇒	◂ Indicated on display
Steering 0 or 1	Engine 0 or 1	Gearbox 0 or 1	Not used	

Gearbox control unit: (Vehicles with automatic gearbox only)
- 0: No information received by gearbox control unit via CAN bus
- 1: Information received by gearbox control unit via CAN bus

Engine control unit:
- 0: No information received by engine control unit via CAN bus
- 1: Information received by engine control unit via CAN bus

Steering angle sender:
- 0: No information received by steering angle sensor via CAN bus 1)
- 1: Information received by steering angle sender via CAN bus

1) If the steering angle sensor is OK, it sends information even if zero position compensation has not been performed in the event of a change.

Note:

If the vehicle exceeds a speed of 19 km/h then control unit -J104 aborts the self-diagnosis.

6.9 - Final control diagnosis

Final control diagnosis permits checking of the function of the control elements. The control elements are also called actuators. These are components which actuate the control unit when it responds to the incoming sensor signals, for example solenoid valves, relays and pump motors.

Notes:

The final control diagnosis only works on vehiclesequipped with a control unit with the numbers 8D0 407 389 A/D/E.

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Final control diagnosis cannot be performed for control unit no. 4B0 907 389.

Final control diagnosis can and is only to be implemented once after switching on ignition.

The function of the "final control elements" includes all functions and properties of the final control elements under operating conditions. This means, for example:

- An electrically operated hydraulic valve which opens and closes when activated by the control unit.
- The relay of an electric motor which starts the motor when activated by the control unit. Engine starts and produces the required power.

Before running a final control diagnosis, it is advisable to ensure that there are no electrical faults in the system you wish to test. This will enable you to recognise any mechanical faults. Perform fault-finding procedure as described on => Page 6 .

Are you sure there are no electrical faults in the system? If yes, you will recognise the faults in the mechanics of the individual control elements as soon as the final control diagnosis deviates from its description. In this case, renew the affected component.

Final control diagnosis with the Bosch ABS/ESP 5.3 system permits checking of the electrically actuated hydraulic valves and the pump motor in the hydraulic control unit.
You can also check that the brake pipes to the four wheels are connected correctly.

Notes:

- The vehicle must be raised until all wheels are free to run. Ask a second mechanic to help. It must be checked whether the wheels are locked or can be turned.
- The -C- key can be used to exit from the test sequence at any time.
- To avoid overloading the "final control elements" they are only actuated during the test sequence for a period of 60 or 90 seconds. The final control test will be terminated if the "⇒ key is not pressed within this period.
- The ABS/EDL warning lamp and the red brake fault symbol flash during the final control diagnosis.
- If the brake pedal is pressed repeatedly this will exhaust the vacuum in the brake servo. For this reason, the brake pedal must be pressed harder in order to achieve the same braking effect. It may be advisable to start the engine briefly. The vacuum in the servo is then built up again.

When implementing the final control diagnosis function the individual test steps are shown in the second line of the V.A.G 1551 display. The following abbreviations are used:

I = Inlet valve

O = Outlet valve

FL = front left

FR = front right

RL = rear left

RR = rear right

VBAT = Battery voltage applied to valve

0V = No voltage at valve; 0 Volt

Locked/free = Wheel condition; must be checked by 2nd mechanic

Hydr-P = Hydraulic pump

- Connect vehicle diagnostic, testing and information system VAS 5051/fault reader V.A.G 1551 and select "Brake electronics" with address word 03.
- Check the control unit version => Page 48 and press the ⇒ key.

-> Indicated on display:

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

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

-> Indicated on display:

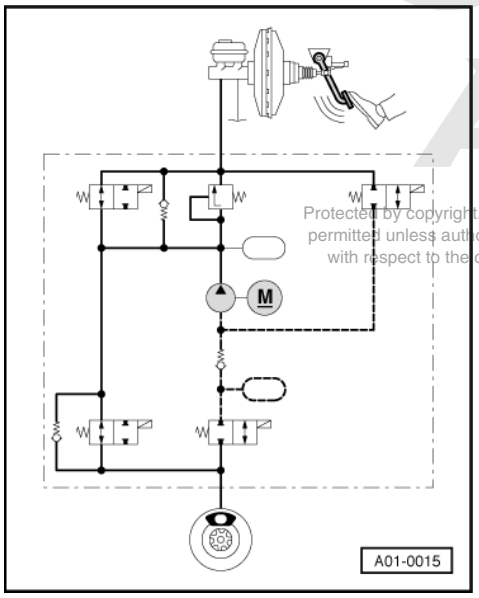
```
Rapid data transfer      Q
03 - Final control diagnosis
```

- Confirm input with Q key.

-> Indicated on display:

```
Final control diagnosis      -
Hydraulic pump ABS - V39
```

Hydraulic pump ABS-V39 must run. It can be heard.



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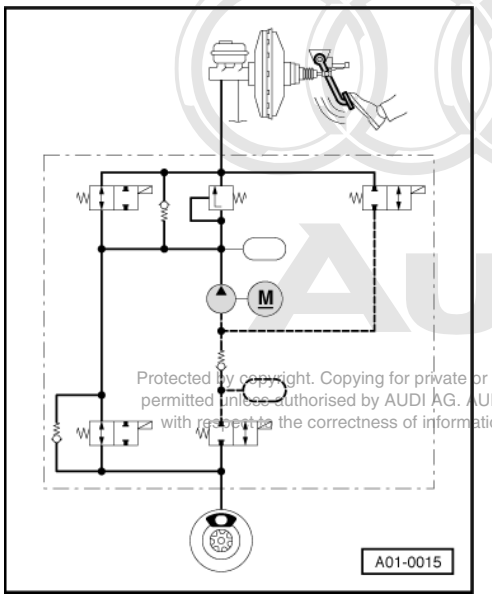
-> When you put your foot on the brake pedal you can feel it vibrating. The brake pedal vibrates because the hydraulic pump generates pressure pulses in the brake pipes. These pressure pulses induce vibrations. These are transferred to the brake pedal and the vibrations can be detected there.

The pressure pulses in the brake pipes are not sufficient to lock the wheels.



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-> The drawing on the left is a schematic diagram of the hydraulic circuit of an ABS/EDL system. This will give a better understanding of the various test steps in the final control diagnosis.

- The shaded components are active.
- Thin solid lines represent hydraulic pipes or hoses which are not under pressure.
- Thick broken lines represent hydraulic pipes or hoses working as suction lines.
- Thick solid lines represent hydraulic pipes or hoses which are under pressure.

- Press ⇒key.

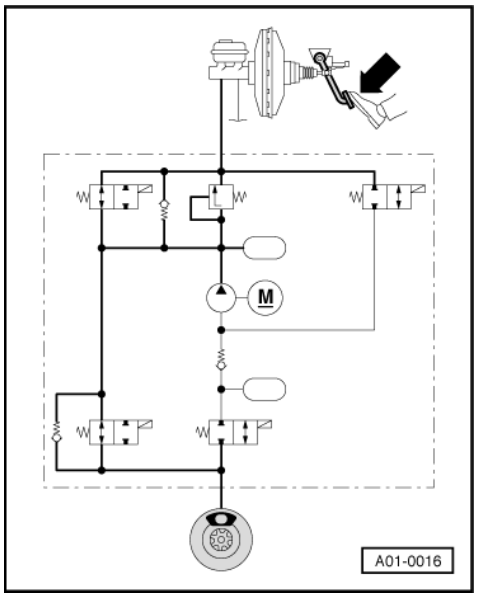
-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

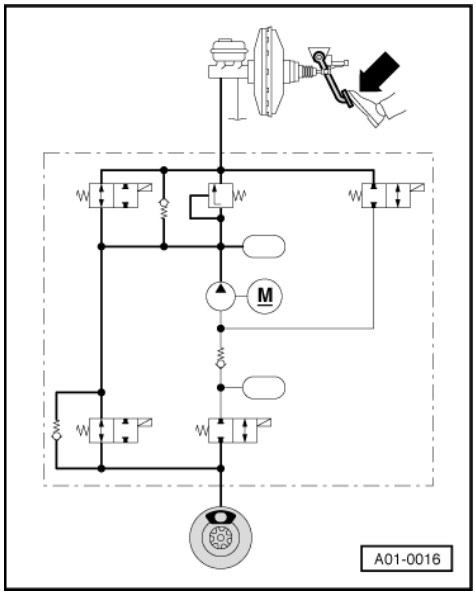
-> Indicated on display:

```
Final control diagnosis      -
IFL: 0V     OFL: 0V     wheel FL blocked
```



-> When you press the brake pedal, brake fluid pressure will be built up in all four wheel brake cylinders. All four wheels will be locked.

This presupposes proper functioning of the mechanical and hydraulic components of the brake system. This means, that the brake master cylinder is able to build up pressure in all wheel brake cylinders and that there are no leaks in the hydraulic connections and pipes.



If the wheels do not lock, perform a visual inspection of the brake fluid reservoir, the master cylinder, the hydraulic unit and the wheel cylinders.

To start with, however, concentrate on the front left wheel. The function of the control elements for this wheel is tested first.

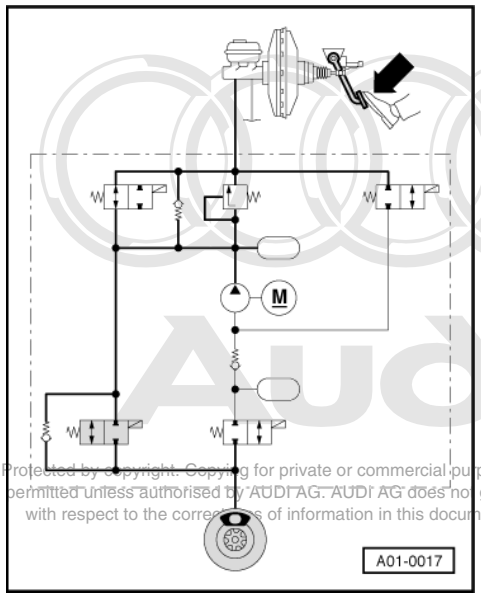
Note:

This test step in the final control diagnosis corresponds to the "pressure build-up" phase during ABS-controlled braking.

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis     -
IFL: VVBAT     OFL: 0V     wheel FL
blocked
```



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Keep pressing the brake pedal.

-> The inlet valve is actuated. It interrupts the brake pipe. However, the fluid pressure is still maintained in the wheel cylinder. The front left wheel remains locked.

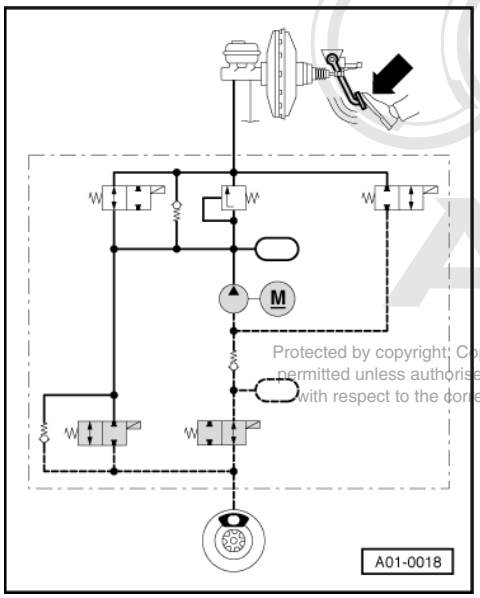
Note:

This test step in the final control diagnosis corresponds to the "maintain pressure" phase during ABS-controlled braking.

- Press ⇒key.

-> Indicated on display:

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



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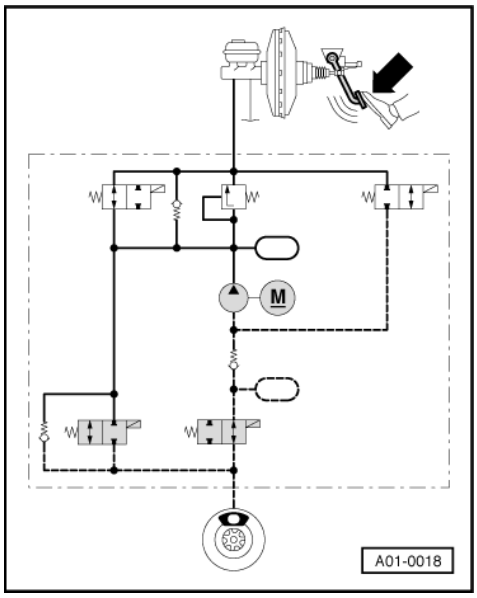
Keep pressing the brake pedal. The inlet valve and the outlet valve for the front left wheel are activated. The hydraulic pump starts running and reduces the fluid pressure in the wheel cylinder via the open outlet valve.

The brake pedal must not give, and should press back harder against your foot.

You should now be able to turn the front left wheel.

If you cannot turn the wheel, check whether the brake line for the front left wheel is correctly connected.



If this is the case, this indicates that there is a mechanical fault in one of the valves, providing that there is no electrical fault in the system. Renew the hydraulic control unit.

If the brake pedal gives under your foot, this means that the inlet valve or the non-return valve connected in parallel with the inlet valve is leaking. Renew the hydraulic control unit.

Note:

This test step in the final control diagnosis corresponds to the "pressure reduction" phase during ABS-controlled braking.

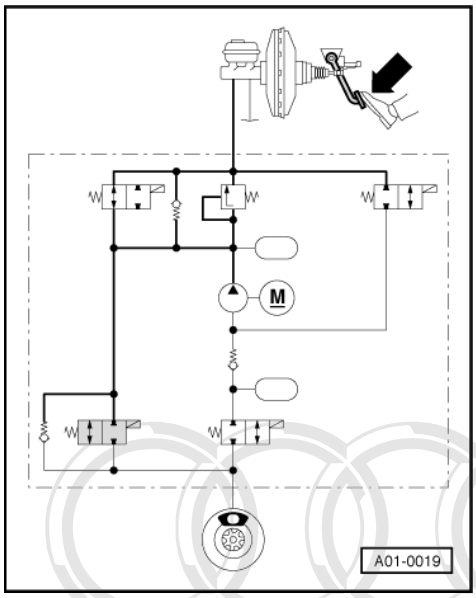
- Press ⇒key.

-> Indicated on display:

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

Hydraulic pump ABS -V39 stops running.

Keep pressing the brake pedal. Only the inlet valve is now actuated and interrupts the brake pipe. Front left wheel can be turned if inlet valve is not leaking.



If wheel cannot be turned, there is a leak either in the inlet valve or in the non-return valve connected in parallel with it. Renew the hydraulic control unit.

- Press ⇒key.

-> Indicated on display:

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

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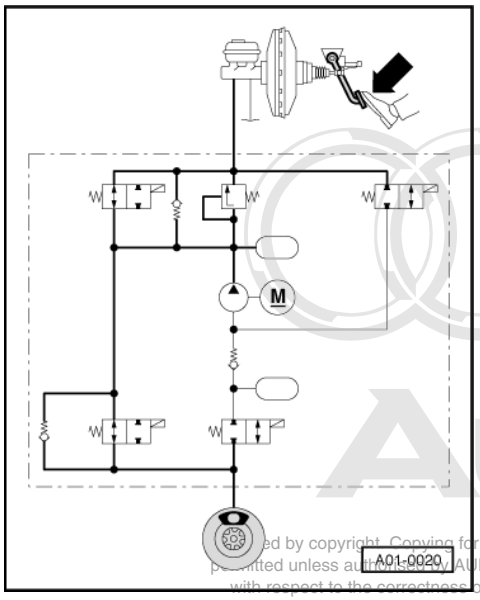

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Keep pressing the brake pedal. Inlet valve is no longer actuated. It no longer interrupts brake pipe. Brake pedal sags perceptibly. Fluid pressure is built up in front left wheel brake cylinder. Wheel locks.

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

Continue the final control diagnosis in order to check the front right, rear left and rear right wheels in turn. The test steps are the same as for the front left wheel. Thus there are not described in detail.

-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IFR: 0V     OFR: 0V     wheel FR blocked
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IFR: UBAT     OFR: 0V     wheel FR blocked
```

- Press ⇒key.

Hydraulic pump ABS-V39 must run.

Brake pedal must not give.

-> Indicated on display:

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

- Press ⇒key.

Hydraulic pump ABS -V39 stops running.

-> Indicated on display:

```
Final control diagnosis      -
IFR: UBAT     OFR: 0V     Wheel FR free
```

- Press ⇒key.

Brake pedal should give perceptibly.

-> Indicated on display:

```
Final control diagnosis      -
IFR: 0V     OFR: 0V     wheel FR blocked
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

-> Indicated on display:

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

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IRL: VBAT     ORL: 0V     wheel RL locked
```

- Press ⇒key.

Hydraulic pump ABS-V39 must run.

Brake pedal must not give.

-> Indicated on display:

```
Final control diagnosis      -
IRL: VBAT     ORL: VBAT     Wheel RL free
```

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- Press ⇒key.

Hydraulic pump ABS -V39 stops running.

-> Indicated on display:

```
Final control diagnosis      -
IRL: VBAT     ORL: 0V     Wheel RL free
```

- Press ⇒key.

Brake pedal should give perceptibly.

-> Indicated on display:

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

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
Operate brakes
```

- Press ⇒key.

-> Indicated on display:

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

- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
IRR: UBAT     ORR: 0V     wheel RR locked
```

- Press ⇒key.

Hydraulic pump ABS-V39 must run.

Brake pedal must not give.

-> Indicated on display:

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

- Press ⇒key.

Hydraulic pump ABS -V39 stops running.

-> Indicated on display:

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

- Press ⇒key.

Brake pedal should give perceptibly.

-> Indicated on display:

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

- Press ⇒key.

-> Indicated on display:

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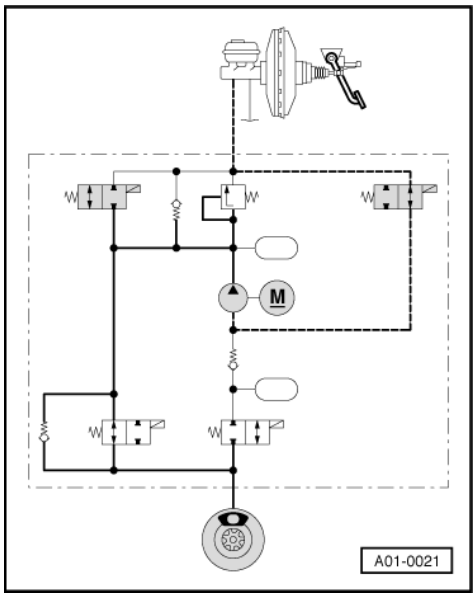
```
Final control diagnosis      -
Release brakes
```

- Press ⇒key.

-> Indicated on display:

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



The EDL change-over valve (left) and the EDL inlet valve (right) are actuated. ABS/EDL hydraulic pump -V39 runs for one second. Pump draws brake fluid out of fluid reservoir. The hydraulic pump builds up brake fluid pressure in the EDL controlled wheel brake cylinders. These wheels lock.

If this is not the case, this indicates that there is a mechanical fault in one of the valves, provided that there are no electrical faults in the system. Renew the hydraulic control unit.

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- Press ⇒key.

-> Indicated on display:

```
Final control diagnosis      -
End
```

The final control diagnosis is complete. The ABS/EDL warning lamp and the brake system warning lamp extinguish.

- Press ⇒key.

-> Indicated on display:

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

Note:

- If the ABS/EDL warning lamp does not extinguish then there is a fault in the system. Keep exactly to the specified test sequence => Page 6 .

- Press keys 0 and 6 for the "End output" function and press the Q key to confirm entry.

6.10 - Bleeding the hydraulic system

ESP hydraulic pump -V156 is actuated to bleed the hydraulic system

=> Brake System; Repair group 47

- Connect vehicle diagnostic, testing and information system VAS 5051/fault reader V.A.G 1551 and select "Brake electronics" with address word 03.

-> Indicated on display:

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

- Press keys 0 and 4 to select function "Basic setting".

-> Indicated on display:

```
Rapid data transfer      Q
04 - Basic setting
```

- Confirm input with Q key.

-> Indicated on display:

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

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- Press keys 0, 0 and 2 and confirm entry by pressing Q.

-> Indicated on display:

```
System in basic setting      2
Bleed system     OK
```

ESP hydraulic pump -V156 is actuated for 10 seconds.

- Press the ⇒ key to terminate the function.

-> Indicated on display:

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

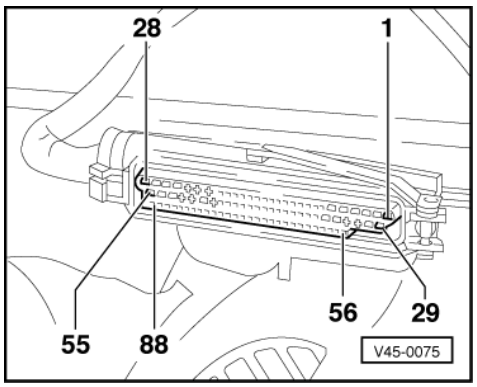
7 - ESP Electrical check

7.1 - ESP Electrical check

- For vehicles for which the self - diagnosis does not give any indication of the source of the fault the complete electrical check must be worked through.
- In vehicles in which the self- diagnosis provides a direct indication of the source of the fault only perform the test steps recommended in the fault table (specific testing).

Test requirements

- An "Automatic test sequence" must first be performed to establish that any faults present in the gearbox and engine control units can only originate from the ABS.
  - Connect fault reader V.A.G 1551 and select address word 00 with ignition switched on.



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- After completing the "Electrical check", interrogate and erase the fault memories of the gearbox and engine control units.

- **-> Ensure multiple connector between wiring harness and control unit -J104 is in perfect condition, i.e. not bent, broken or corroded contacts. Replace any damaged contacts using wiring harness repair kit VAS 1978.**

Note:

The instructions supplied with wiring harness repair kit VAS 1978 normally do not permit repairs to the wiring of the ABS and its associated systems. However, this only applies to the screened wiring in the systems.

- Switch ignition and electrical consumers off before commencing the check (headlights, lighting, fan, etc.).
- For test steps 13 to 16 the vehicle must be raised so that the wheels can turn freely. On vehicles with manual gearbox put the gear lever in neutral. On vehicles with automatic gearbox move the selector lever to position "N".

The following equipment is required:

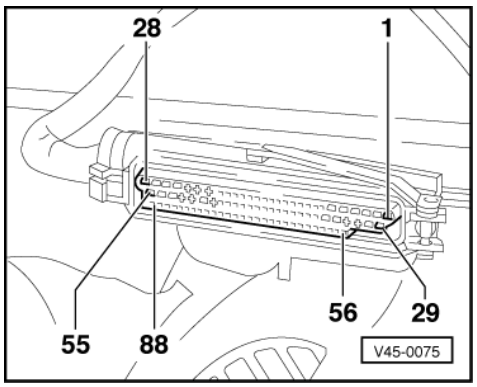
- Fault reader V.A.G 1551 or vehicle systems tester V.A.G 1552
- Test box V.A.G 1598/20
- Adapter cable set V.A.G 1594
- Hand-held multimeter V.A.G 1526
- Pressure gauge V.A.G 1310 A

Connecting test box V.A.G 1598/20 and checking ESP system.

- Switch ignition off.
- Remove control unit-J104

=> Brake System; Repair group 45

- Unplug multi-pin connector from control unit -J104.
- Check multi-pin connector between wiring harness and control unit -J104.



-> Socket designations of test box V.A.G 1598/20 are identical with contact designations on control unit -J104 as well as those on wiring harness connector.

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- Connect test box V.A.G 1598/20 to multi-pin connector on wiring harness.

Contact assignment of control unit -J104

Multi-pin connector on control unit -J104			
Contact	closed		Contact
1	=>	Voltage supply from terminal 15 TCS/ESP switch	- 5
2	=>	Voltage supply from terminal 15 Return pump relay -J105 Solenoid valve relay ABS -J106 Steering angle sender -G85; [control unit 8D0 907 389/A/D/E] Steering angle sender -G85; [control unit 4B0 907 389]	86 86 5 3
3	=>	Hydraulic unit; actuation of outlet valve, front left -N102	15
4	=>	Hydraulic unit; actuation of outlet valve, rear right -N135	12
5	=>	Hydraulic unit; actuation of inlet valve, front left -N101	8
6	=>	Hydraulic unit; actuation of inlet valve, rear right -N133	2
7	=>	Return pump relay -J105 (earth)	85
8	=>	Front left speed sensor -G47 - Vehicles with 4WD	-

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
9	=>	Front left speed sensor -G47 - Vehicles with FWD	-
10	=>	Front left speed sensor -G47 (earth)	-
11	=>	Rear right speed sensor -G44	-
12	=>	Rear right speed sensor -G44 (earth)	-
13	=>	Rear left speed sensor -G46	
14	=>	Rear left speed sensor -G46 (earth)	-
15	=>	Front right speed sensor -G45	-
16	=>	Front right speed sensor -G45 (earth)	-
17	=>	Not used	-

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
18	=>	Lateral acceleration sender -G200; signal wire [control unit 4B0 907 389]	2
18	=>	Lateral acceleration sender -G200; signal wire (combined sender for yaw rate and lateral acceleration) [control unit 8D0 907 389/A/D/E]	4

19	=>	Lateral acceleration sender -G200; (earth) [control unit 4B0 907 389]	1
19	=>	Not used; [control unit 8D0 907 389/A/D/E]	-
20	=>	Return pump relay -J105 Hydraulic unit; monitoring connection for return pump -V39	87 14
21	=>	Not used	-
22	=>	ESP hydraulic pump -V156; voltage supply	2
23	=>	Not used	-
24	=>	ESP hydraulic pump -V156; (earth)	1

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
25	=>	Hydraulic unit; actuation of outlet valve, rear left -N136	11
26	=>	Hydraulic unit; actuation of inlet valve, front right-N99	5
27	=>	Not used	-
28	=>	Earth connection, terminal 31	-
29	=>	Earth connection, terminal 31	-
30	=>	Not used	-
31	=>	Dash panel insert; TCS/ESP-lamp -K86 [control unit 4B0 907 389]	=> CFD
31	=>	Wheel speed sensor output rear left; [control unit 8D0 907 389/A/D/E]	-
32	=>	Dash panel insert, ABS/EDL lamp -K47	=> CFD
33	=>	Not used	-

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
34	=>	Yaw rate sender -G202; voltage supply; [control unit 4B0 907 389]	2
34	=>	Yaw rate sender -G202; voltage supply (combined sender for yaw rate and lateral acceleration) [control unit 8D0 907 389/A/D/E]	1
35	=>	Not used	-
36	=>	Not used; [control unit 4B0 907 389]	-
36	=>	Solenoid valve relay -J106 (earth); [control unit 8D0 907 389/A/D/E]	85
37	=>	Solenoid valve relay -J106 (earth); [control unit 4B0 907 389]	85
37	=>	Not used; [control unit 8D0 907 389/A/D/E]	-
38	=>	Not used	-
39	=>	Not used	-

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
40	=>	Not used	-
41	=>	Not used	-
42	=>	Brake light switch -F; brake test switch	4
43	=>	Not used	-
44	=>	TCS/ESP switch	6
45	=>	Not used	-
46	=>	Diagnostic connector; K-wire	7
47	=>	Not used	-
48	=>	Brake light switch -F; brake light switch	2
49	=>	Hydraulic unit -N55; actuation of switch valve 1 for ESP -N225	7
50	=>	Hydraulic unit -N55; actuation of ESP -N226	6
51	=>	Voltage supply, terminal 30 for ESP hydraulic pump -V156;	-

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
52	=>	Hydraulic unit -N55; actuation of ESP high-pressure valve 2 -N228	4
53	=>	Hydraulic unit -N55; actuation of ABS inlet valve rear left -N134	3
54	=>	Hydraulic unit -N55; actuation of ESP high-pressure valve 1 -N227	1
55	=>	Hydraulic unit -N55; actuation of outlet valve front right -N100	9
56	=>	Not available	-
57	=>	Not available	-
58	=>	Not available	-
59	=>	Not available	-
60	=>	Not available	-
61	=>	Not used	-
62	=>	Not used	-
63	=>	Not used	-

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
64	=>	CAN bus low; Engine control unit, Gearbox control unit, Steering angle sender-G85	=> CFD 2
65	=>	Not used; [control unit 4B0 907 389]	-
65	=>	CAN bus screen; [control unit 8D0 907 389/A/D/E]	-
66	=>	CAN bus high (engine control unit, gearbox control unit, Steering angle sender -G85)	=> CFD 3

67	=>	Brake pressure sender -G201; (earth) [control unit 4B0 907 389]	1
67	=>	Brake pressure sender -G201; voltage supply [control unit 4B0 907 389/A/D/E]	1
68	=>	Brake pressure sender -G201; signal wire	2
69	=>	Brake pressure sender -G201; voltage supply [control unit 4B0 907 389]	3
69	=>	Brake pressure sender -G201; (earth) [control unit 8D0 907 389/A/D/E]	3

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
70	=>	Wheel speed sensor output rear left; [control unit 4B0 907 389]	=> CFD
70	=>	Dash panel insert; TCS/ESP-lamp -K86; [control unit 8D0 907 389/A/D/E]	=> CFD
71	=>	Speed sensor output, rear right.	=> CFD
72	=>	Not used; [control unit 4B0 907 389]	-
72	=>	Wheel speed sensor output front left; [control unit 8D0 907 389/A/D/E]	=> CFD
73	=>	Not used; [control unit 4B0 907 389]	-
73	=>	Wheel speed sensor output front right; [control unit 8D0 907 389/A/D/E]	=> CFD
74	=>	Not used	-
75	=>	Lateral acceleration sender -G200; voltage supply, [control unit 4B0 907 389]	3
75	=>	Not used; [control unit 8D0 907 389/A/D/E]	-
76	=>	Handbrake warning switch -F9	=> CFD

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
77	=>	Yaw rate sender -G202; test signal [control unit 4B0 907 389]	5
77	=>	Yaw rate sender -G202; test signal (combined sender for yaw rate and lateral acceleration) [control unit 8D0 907 389/A/D/E]	3
78	=>	Yaw rate sender -G202; reference signal [control unit 4B0 907 389]	4
78	=>	Yaw rate sender -G202; reference signal (combined sender for yaw rate and lateral acceleration) [control unit 8D0 907 389/A/D/E]	5
79	=>	Yaw rate sender -G202; signal wire; [control unit 4B0 907 389]	3
79	=>	Yaw rate sender -G202; signal wire (combined sender for yaw rate and lateral acceleration) [control unit 8D0 907 389/A/D/E]	6
80	=>	Yaw rate sender -G202; (earth) [control unit 4B0 907 389]	1

80	=>	Yaw rate sender -G202; (earth) (combined sender for yaw rate and lateral acceleration) [control unit 8D0 907 389/A/D/E]	2

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Multi-pin connector on control unit -J104			
Contact	closed		Contact
81	=>	Not used	-
82	=>	Not used	-
83	=>	Not used	-
84	=>	Not used	-
85	=>	Not used	-
86	=>	Not used; [control unit 4B0 907 389]	-
86	=>	Dash panel insert, standing time signal; [control unit 8D0 907 389/A/D/E]	=> CFD
87	=>	Not used	-
88	=>	Not used	-

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

Notes on fault table

- The socket descriptions of test box V.A.G 1598 are identical to the contact descriptions of control unit -J104 in the current flow diagram. Incorrect test procedures can cause system damage. Do not make connections between any contacts other than those listed in the test table.

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- The specified values refer to the readings obtained on tester V.A.G 1526 and are not necessarily applicable to other test units.
- If the readings obtained do not match the specified values, carry out the fault remedy measures in the right-hand part of the table.

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- If the specified values are achieved, also check wiring for loose contacts and short circuit to positive and earth. This applies especially to sporadic faults.
- Use test leads V.A.G 1594 for checking continuity (bridging leads).
- If the measured figures only differ slightly from the specified values, clean the sockets and plugs of the testers and test leads (with contact spray G 000 700 04) and repeat the check. Before replacing components, check wiring and connections again. This is particularly important if the specification calls for a resistance reading of less than 10 ω.

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7.2 - Electrical check; Test steps 1-12

Measuring resistance: Set measuring range (200 ω) on V.A.G 1526					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

1	5 + 3	Inlet valve -N101, outlet valve -N102, front left			- Infinite resistance indicates an open circuit in wiring. Check accordingly.
2	55 + 26	Inlet valve -N99, outlet valve -N100, front right		9ω/22ω	- A resistance reading below the specified range indicates a short between the two wires. Check accordingly.
3	53 + 25	Inlet valve -N134, outlet valve -N136, rear left			- In all cases test wiring for short to earth and short to positive.

Measuring resistance: Set measuring range (200 ω) on V.A.G 1526					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
4	6 + 4	Inlet valve -N133, outlet valve -N135, rear right		9ω/22ω	=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If electrical wiring is OK renew hydraulic unit.
5	49 + 50	- Switch valve 1 for ESP -N225 - Switch valve 2 for ESP -N226		12ω/28ω	- Infinite resistance indicates an open circuit in wiring. Check accordingly. - A resistance reading below the specified range indicates a short between the two wires. Check accordingly.

Measuring resistance: Set measuring range (200 ω) on V.A.G 1526					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
6	52 + 54	- High-pressure switch valve 1 for ESP -N227 - High-pressure switch valve 2 for ESP -N228		6ω/16ω	- In all cases test wiring for short to earth and short to positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If electrical wiring is OK renew hydraulic unit.

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Measuring resistance: Set measuring range (200 ω) on V.A.G 1526					
7	8 + 10 1) 9 + 10 2)	Speed sensor - G47, front left		400ω/2300ω	- Infinite resistance indicates an open circuit in wiring. Check accordingly.

The output connections on control unit -J104 are wired differently for the various different versions.

1) 4WD vehicles

2) FWD vehicles

Measuring resistance: Select measuring range on V.A.G 1526 (2 kω or 20 kω)					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
8	15 + 16	Speed sensor - G45, front right			- A resistance reading below the specified range indicates a short between the two wires. Check accordingly.
9	13 + 14	Speed sensor - G46, rear left		400ω/2300ω	- In all cases test wiring for short to earth and short to positive.
10	11 + 12	Speed sensor -G44 rear right			=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If the electrical wiring is OK renew the relevant speed sensor.

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Measuring resistance: Select measuring range on V.A.G 1526 (200 ω)					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
11	2 + 37 1) 2 + 36 2)	Actuation of solenoid valve relay -J106			- Infinite resistance indicates an open circuit in wiring. A resistance reading below the specified range indicates a short between the two wires.

12	2 + 7	Actuation of return pump relay -J105		5font=symbol charset=fontspecific code=48 descr='[nd0]'ω/70ω	- In all cases test wiring for short to earth and short to positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Replace relay if wiring is OK and specified value is not attained

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The output connections on control unit -J104 are wired differently for the various different versions.

1) Vehicles with control unit 4B0 907 389

2)Vehicles with control unit 8D0 907 389/A/D/E

7.3 - Electrical check; Test steps 13-27

Functional check + test for correct connections					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
13 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N101 and brake line connection, front left	▪ Ignition on. - Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 5 + 28. Depress and hold down brake pedal.	- Front left wheel can be turned by hand	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly.

Continued next page.

The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

Continued:

Functional check + test for correct connections

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
13 1)	Jumper 1 + 2, 28+37 2) 28+36 3)	Inlet valve -N101 and brake line connection, front left	- Remove bridge connection. - Release brake pedal.	- Front left wheel locked.	- If all wheels are locked, inlet valve is not functioning properly => Fault table, Fault code 00257.

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The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

Functional check + test for correct connections					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
14 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N99 and brake line connection, front right	▪ Ignition on. - Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 26 + 28. Depress and hold down brake pedal.	- Front right wheel can be turned by hand.	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly.

Continued next page.

The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

Continued:

Functional check + test for correct connections					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

14 1)	Jumper 1 + 2, 28+37 2) 28+36 3)	Inlet valve -N99 and brake line connection, front right	- Remove bridge connection. - Release brake pedal.	- Front right wheel locked	- If all wheels are locked, inlet valve is not functioning properly => Fault table, Fault code 00259.

The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

Functional check + test for correct connections					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
15 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N134 and brake line connection, rear left	▪ Ignition on. - Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 53 + 28. Depress and hold down brake pedal.	- Rear left wheel can be turned by hand.	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly.
		Continued next page.			

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The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

Continued:

Functional check + test for correct connections					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**

15 1)	Jumper 1 + 2, 28+37 2) 28+36 3)	Inlet valve -N134 and brake line connection, rear left	- Remove bridge connection. - Release brake pedal.	- Rear left wheel locked	- If all wheels are locked, inlet valve is not functioning properly => Fault table, Fault code 00274.

The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

Functional check + test for correct connections					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
16 1)	Jumper 1 + 2, 28 + 37	Inlet valve -N133 and brake line connection, rear right	▪ Ignition on. - Move selector lever to "N" on vehicles with automatic gearbox. Bridge across sockets 6 + 28. Depress and hold down brake pedal.	- Rear right wheel can be turned by hand.	- If the wheel is locked, check whether one of the other wheels can be turned. If so, the hydraulic brake lines have been connected the wrong way round. Check brake pipe connections and unions. Ensure that brakes are working properly.

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The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

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Continued:

Functional check + test for correct connections					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**

16 1)	Jumper 1 + 2, 28+37 2) 28+36 3)	Inlet valve -N133 and brake line connection, rear right	- Remove bridge connection. - Release brake pedal.	- Rear right wheel locked	- If all wheels are locked, inlet valve is not functioning properly => Fault table, Fault code 00273.

The output connections on control unit -J104 are wired differently for the various different versions.

1) Two mechanics are required to perform this test.

2) Vehicles with control unit 4B0 907 389

3)Vehicles with control unit 8D0 907 389/A/D/E

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Functional check: ABS warning lamp-K47					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
17	-	Function of ABS warning lamp -K47	▪ Fault memory was interrogated and there is no fault present in the fault memory of the control unit -J104. ▪ Ignition switched off ▪ Multi-pin connector connected to control unit -J104 and engaged.		
		Continued next page.			

Continued:

Functional check: ABS warning lamp-K47					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
17	-	Function of ABS warning lamp -K47	- Switch on ignition.	Warning lamp -K47 is lit up for 2 seconds and then goes out again.	- If ABS warning lamp does not light check electrical system voltage and wiring from contact 32 of control unit -J104 to dash panel insert for short to earth.
		Continued next page.			

Continued:

Functional check: ABS warning lamp-K47

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
17	-	Function of ABS warning lamp -K47			- ABS warning lamp does not extinguish after 2 seconds. After 3 seconds the symbol "Fault brake system" illuminates. Check wiring from contact 32 of control unit -J104 to dash panel insert for short to positive and open circuit. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If the voltage of the electrical system is OK and wiring from contact 32 of control unit -J104 to dash panel insert is intact => Fault in dash panel insert => Electrical System; Repair group 90; Dash panel insert Dash panel insert

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Functional check: Red brake fault symbol					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
18	-	Function of red symbol "Fault brake system"	▪ Brake fluid level OK => Brake System; Repair group 47 ▪ Function of ABS warning lamp -K47 checked in test step 17. ▪ Multi-pin connector connected to control unit -J104 and engaged. ▪ Switch on ignition.		
		Continued next page.			

Continued:

Functional check: Red brake fault symbol					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

18	-	Function of red symbol "Fault brake system"	- Connect V.A.G 1551, select address word 03 On vehicles with automatic gearbox and dash panel insert with FIS, press brake pedal and engage a gear.	ABS/EDL warning lamp and red brake fault symbol should light up. TCS/ESP warning lamp will also light up if it is working properly.	- Fault in dash panel insert => Electrical System; Repair group 90; Dash panel insert Dash panel insert

Functional check: TCS/ESP warning lamp -K86.					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
19	-	Function of TCS/ESP warning lamp -K86	▪ Fault memory was interrogated and there is no fault present in the fault memory of the control unit -J104. ▪ Ignition switched off ▪ Multi-pin connector connected to control unit -J104 and engaged.		
		Continued next page.			

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Continued:

Functional check: TCS/ESP warning lamp -K86.					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
19 Continued:	-	Function of TCS/ESP warning lamp -K86	- Switch on ignition.	Warning lamp -K86 should light up for 2 seconds and then extinguish.	- If the TCS/ESP warning lamp does not light up, check voltage of electrical system and test wiring from contact 31 of control unit -J104 to dash panel insert for open circuit and short to positive. If TCS/ESP warning lamp lights continuously check wiring from contact 31 of control unit -J104 to dash panel insert for short to earth. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
		Continued next page.			

Continued:

Functional check: TCS/ESP warning lamp -K86.					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
19	-	Function of TCS/ ESP warning lamp -K86			- Are the vehicle voltage and the wiring from contact 31 of control unit -J104 to the dash panel insert OK? => Fault in dash panel insert => Electrical System; Repair group 90; Dash panel insert Dash panel insert

Functional check: TCS/ESP switch, select measuring range on V.A.G 1526: 20 V =					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
20	-	Function of TCS/ ESP switch	▪ Ignition switched off ▪ Function of TCS/ ESP warning lamp -K86 checked in test step 19. ▪ Multi-pin connector connected to control unit -J104 and engaged.		
		Continued next page.			

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Continued:

Functional check: TCS/ESP switch, select measuring range on V.A.G 1526: 20 V =					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
20	-	Function of TCS/ ESP switch	- Switch on ignition.		
			- Press TCS/ESP switch.	Warning lamp for TCS/ESP -K86 lights.	- Switch off the ignition. Release multiple connector from control unit -J104 and detach.
			- Operate TCS/ ESP switch again	TCS/ESP Warning lamp -K86 goes out.	- Connect test box V.A.G 1598/20.
		Continued next page.			

Continued:

Functional check: TCS/ESP switch, select measuring range on V.A.G 1526: 20 V =

Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
20	28 + 44	Function of TCS/ ESP switch	▪ Ignition switched on - TCS/ESP switch not pressed	0.0 - 1.0 V	- Check wiring from contact 28 to earth. Check wiring from contact 44 to TCS/ ESP switch, contact 6. Check voltage supply from contact 5 of TCS/ESP switch to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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Continued:

Functional check: TCS/ESP switch, select measuring range on V.A.G 1526: 20 V =					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
20	28 + 44	Function of TCS/ ESP switch	- TCS/ESP switch is pressed.	10.0 - 14.5 V	- Check wiring from contact 28 to earth. Check wiring from contact 44 to TCS/ ESP switch, contact 6. Check voltage supply from contact 5 of TCS/ESP switch to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If no fault could be detected during the test steps already carried out the TCS/ ESP switch must be replaced.

Select voltage test range on V.A.G 1526: 20 V =					
Test step	V.A.G 1598/20 sockets	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value

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21	1 + 28 1 + 29	Voltage supply of control unit through terminal 15	▪ Ignition switched on	10.5 - 14.5 V	- Check wiring from contacts 28 and 29 to earth. Check wiring from terminal 1 via fuse (10A) to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
22	-	Voltage supply of solenoid valves via solenoid valve relay -J106.	- Remove solenoid valve relay -J106 => Brake System; Repair group 45 - Test voltage supply of solenoid valve relay -J106, contact 30, for open circuit and short to positive or earth.	10.5 - 14.5 V	- Check relevant fuse (25A) and repair damaged wiring => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
		Continued next page.			

Continued:

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
22	-	Voltage supply of solenoid valves via solenoid valve relay -J106.	- Check wiring from solenoid valve relay -J106, contact 87 to hydraulic unit -N55, contact 10 for open circuit and short to positive/ earth.		- Repair damaged wiring If voltage supply wiring is OK, renew relay. If the original fault "solenoid valve relay -J106" has still not been rectified, renew hydraulic unit.

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
23	-	Supply voltage to return pump relay -J105 by terminal 30	- Remove return pump relay -J105. => Brake System; Repair group 45		

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			- Check voltage supply of return pump relay -J105, at contact 30, for open circuit and short to positive or earth.	10.5 - 14.5 V	- Check relevant fuse (60A) and repair damaged wiring => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
24	-	- Earth and voltage supply for return pump -V39	- Remove return pump relay -J105. => Brake System; Repair group 45		
Continued next page.					

Continued:

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
24	-	- Earth and voltage supply for return pump -V39	- Check wiring from solenoid valve relay -J105, contact 87 to control unit -J104, contact 20 and hydraulic unit -N55, contact 24 for open circuit or short to positive/earth.		- Repair damaged wiring
Continued next page.					

Continued:

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
24	-	- Earth and voltage supply for return pump -V39	- Check earth connection of return pump at hydraulic unit -N55, contact 13.		- Rectify open circuit or short to positive in earth connection.
Continued next page.					

Continued:

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
24	Jumper 7 + 28, 1 + 2	- Function of return pump relay -J105.	▪ Return pump relay -J105 is installed.		

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			- Measure voltage between sockets 20 and 29 on V.A.G 1598/20. - Switch on ignition for not longer than 10 seconds; switch off ignition.	- Voltage across sockets 20 +29 should be 10.5 - 14.5 V. - Return pump - V39 should run.	- Replace relay if no voltage is measured between sockets 20 and 29. If voltage is measured between sockets 20 and 29 return pump is defective and ABS hydraulic unit -N55 is to be replaced.

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
25	51 + 28	Control unit -J104 is supplied with power at contact 51 via terminal 30. This voltage supply enables control unit -J104 to provide power for EPS hydraulic pump -V156.	- Check wiring from control unit -J104 contact 51 to terminal 30 for open circuit and short to earth.	10.5 - 14.5 V	- Check relevant fuse (25A) and repair damaged wiring => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
26	28 + 48	Function of brake light switch -F **Continued next page.**	▪ Ignition switched off ▪ Brake pedal not operated Brake pedal operated	0.0 - 1.0 V 10.0 - 14.5 V	- Check wiring from contact 28 to earth. - Check wiring from terminal 48 via fuse (10A) to terminal 30. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Adjust brake light switch -F. => Brake System; Repair group 45

Continued:

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**

26	28 + 42	Function of brake light switch-F (brake test switch)	▪ Brake pedal not operated Brake pedal operated	10.0 - 14.5 V 0.0 - 1.0 V	- Check wiring from terminal 42 via fuse (10A) to terminal 15. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Adjust brake light switch -F. => Brake System; Repair group 45

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Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
27	1 + 76	Function of handbrake warning switch -F9	▪ Ignition switched on ▪ Handbrake not applied Handbrake applied	 0.0 - 1.0 V 10.0 - 14.5 V	- Check wiring from terminal 1 via fuse (10A) to terminal 15. - Check wiring from contact 76 to handbrake warning switch -F9 for open circuit/short to positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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Continued:

Select voltage test range on V.A.G 1526: 20 V =					
Test step	**V.A.G 1598/20 sockets**	**Testing of**	**▪ Test conditions - Additional operations**	**Specified value**	**Action in the event of deviation from specified value**
27	1 + 76	Function of handbrake warning switch -F9	▪ Handbrake not applied Handbrake applied	0.0 - 1.0 V 10.0 - 14.5 V	- Check earth connection of handbrake warning switch -F9. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder If no fault could be detected during the test steps already carried out the handbrake warning switch -F9 must be replaced.

8 - ESP Fault table

8.1 - ESP Fault table

- Determine test preconditions => Page 6 .
- Connect fault reader V.A.G 1551 and select "Brake electronics" with address word 03 => Page 1
- Check the control unit version => Page 89 and press the ⇒ key.

- Press keys 0 and 2 for "Interrogate fault memory" function and press Q key to confirm entry.

Notes:

- Each fault is assigned a 5-digit fault code. It is listed in the left-hand column of the fault table. The message identifying the fault and the fault code will be printed out on the printer of fault reader V.A.G 1551 if the Print button is pressed. The fault code does not appear on the display of V.A.G 1551.
- The content of the fault memory is retained until it is erased. => Page 5 .
- Sporadic faults are additionally indicated by "/SP" on the right-hand side of the display.
- Static faults which cannot be detected when the vehicle is stationary are also identified with "/SP" after the ignition has been switched off and then on again.
- The following table includes all the faults which can be detected by the control unit -J104 and displayed and printed out by V.A.G 1551. Faults are listed according to fault codes.

8.2 - Fault table; fault codes 00000 to 00526

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00000 No fault recognised! This display means that the self-diagnosis is finished. No faults are stored in the fault memory. If malfunctions are still present, check the following points: **Continued next page.**	- If any warning lamps light there may be a fault in the actuation wiring. - No signal from handbrake warning switch -F9. (Handbrake applied/not applied). - No signal from brake light switch -F.	- Refer to "Warning lamp functions" => Page 97 , display group 2 - Check brake light switch -F. Function 08 "Read measured value block" => Page 97 , display group 2

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00000 **No fault recognised!** **Continued:**	- The zero position of steering angle sender -G85 ("learnt" via zero position compensation) has gone out of adjustment. If no fault can be traced, and the problem continues to exist, there may be a mechanical malfunction (solenoid valve sticking).	- Check zero position of steering angle sender -G85. Function 08 "Read measured value block" => Page 97 , display group 2, 5 - Proceed to "Electrical check", => Page 114 .
00257 ABS inlet valve, front left -N101	- Open circuit or short to positive/earth in wiring between ABS hydraulic unit -N55 and control unit -J104. - Inlet valve -N101 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Perform test steps 1 and 13. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00259		

ABS inlet valve, front left -N99	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS inlet valve -N99 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Perform test steps 2 and +14. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00265 ABS outlet valve, front left -N102	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - Outlet valve -N102 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Test step 1. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00267 ABS outlet valve, front right -N100	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS outlet valve -N100 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Test step 2. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00273 ABS inlet valve, rear right -N133	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS inlet valve -N133 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Perform test steps 4 and +16. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00274 ABS inlet valve, rear left -N134	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS inlet valve -N134 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Perform test steps 3 and +15. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.
00275		

ABS outlet valve, rear right -N135	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS outlet valve -N135 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Test step 4. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00276 ABS outlet valve, rear left -N136	- Open circuit, short to positive or earth in wiring between hydraulic unit -N55 and control unit -J104. - ABS outlet valve -N136 defective. - Control unit -J104 defective.	- Perform "Electrical check" =>Page 114 , Test step 3. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, fit a new control unit.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00283 **Front left speed sensor -G47 Implausible signal**	- Speed sensor -G47 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G47 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 114 , Test step 7.
00283 **Front left speed sensor -G47 Open circuit / short to positive**	- Incorrect control unit. - Open circuit, short to positive in wiring between speed sensor -G47 and control unit -J104.	- Check control unit identification => Page 89 . If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new control unit -J104.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00285 Front right speed sensor -G45 Implausible signal Or:	- Speed sensor -G45 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G45 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 97 , display group 1. Perform "Electrical check", Test step 8.
Front right speed sensor -G45 Open circuit / short to positive	- Incorrect control unit. - Open circuit, short to positive in wiring between speed sensor -G45 and control unit -J104.	- Check control unit identification => Page 89 . If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new control unit -J104.

V.A.G 1551 printer	Possible causes of fault	Fault remedy

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Fault code		
00287 Rear right speed sensor -G44 Implausible signal Or:	- Speed sensor -G44 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G44 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 97 , display group 1. Perform "Electrical check", Test step 10.
Rear right speed sensor -G44 Open circuit / short to positive	- Open circuit, short to positive in wiring between speed sensor -G44 and control unit -J104.	- If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new control unit -J104.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00290 Rear left speed sensor -G46 Implausible signal Or:	- Speed sensor -G46 incorrectly installed - Rotor dirty or damaged - Excessive play in wheel bearing - Speed sensor -G46 defective. - Short to earth.	- Check installation position of speed sensor => Brake System; Repair group 45 97 , display group 1. Perform "Electrical check", Test step 9.
Rear left speed sensor -G46 Open circuit / short to positive	- Open circuit, short to positive in wiring between speed sensor -G46 and control unit -J104.	- If no display is obtained when "Read measured value block", and no fault can be found affecting the speed sensor or the sensor wiring, fit a new control unit -J104.

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00301 ABS return pump -V39 **Continued next page.**	- Open circuit in wiring or excessive contact resistance in switched earth connection from return pump relay -J105, contact 85 to control unit -J104, contact 7. - Open circuit in wiring or excessive contact resistance in switched voltage connection from return pump relay -J105, contact 86 to control unit -J104, contact 2.	- "Read measured value block", display group 6 =>Page 97 Perform "Electrical check" =>Page, Test step 12.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00301 ABS return pump -V39 **Continued:** **Continued next page.**	- Short to positive or earth in one of the actuation wires. - Insufficient supply voltage to return pump relay -J105, contact 30. - Return pump relay -J105 or hydraulic unit -N55 defective.	- Perform "Electrical check" =>Page, Test step 23. Perform "Electrical check" =>Page, Test step 24.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00301 **Continued:**		

ABS return pump -V39 Implausible signal	- Open circuit in wiring or short to earth from return pump relay -J105, contact 87 to control unit -J104, contact 20 and to hydraulic unit -N55, contact 14. - Open wiring or short to positive in earth connection for return pump.	- Perform "Electrical check" =>Page, Test step 24. Repair damaged wiring => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00302 Solenoid valve relay ABS -J106	- Open circuit in wiring or excessive contact resistance in switched earth connection from relay -J106, contact 85 to control unit -J104, contact 37. - Open circuit in wiring or excessive contact resistance in switched voltage connection from relay -J106, contact 86 to control unit -J104, contact 2. - Short to positive or earth in one of the actuation wires.	- "Read measured value block", display group 6 =>Page 97 Perform "Electrical check" =>Page, Test step 11.
Continued next page.	- Incorrect control unit.	- Check control unit identification => Page 89 .

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00302 Solenoid valve relay ABS -J106	- Insufficient supply voltage to relay -J106, contact 30.	- Perform "Electrical check" =>Page, Test step 22.
Continued:	- Solenoid valve relay -J106 or hydraulic unit -N55 defective	

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00526 Brake light switch -F Open circuit	- Brake lights -M9 and/or -M10 defective. - Open circuit in wiring between brake lights and control unit -J104.	- Check the wiring. Perform "Electrical check" => Page, Test step 26. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Replace bulbs
Continued next page.	- Control unit -J104 defective.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00526 **Continued:**	Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.	
Brake light switch -F Implausible signal	- Brake light switch not correctly adjusted.	**- Check brake light switch, "Read measured value block", display group 2 => Page 97 Note: Observe exact setting of brake light switch.**
	- Open circuit or short to positive/earth in wiring between brake light switch -F and control unit -J104.	- Check wiring between brake light switch -F and control unit -J104. Perform "Electrical check" => Page, Test step 26.

Continued next page.	- Brake light switch defective	- If the fault cannot be traced by any of these steps, replace brake light switch. => Brake System; Repair group 46

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00526 Brake light switch -F Implausible signal Continued:	- Control unit -J104 defective.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45
	- Brake master cylinder defective.	- Check and if necessary replace brake master cylinder. => FWD and 4WD Running Gear; Repair group 47
	- Brake servo defective	- Check and if necessary replace brake servo. => FWD and 4WD Running Gear; Repair group 47

8.3 - Fault table; fault codes 00532 to 01421

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00532 **Power supply** **- This fault affects the voltage supply for the control unit.** **- This fault is only stored in memory if it occurs the first time the vehicle speed exceeds 6 km/h.** **- The system will be switched on again and the warning lamps will extinguish as soon as the supply voltage returns to the required level.** **Continued next page.**	- Open circuit or excessive resistance in voltage supply wiring from terminal 15 to control unit -J104, contact 1. - Open wiring or excessive contact resistance in earth connection at control unit -J104, contact 28 and contact 29. - Loss of voltage in electrical system	- Function 08 "Read measured value block" => Page 97 , display group 6 Perform "Electrical check", Test step 21. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Check alternator and voltage regulator. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Test battery => Electrical System; Repair group 27; Battery Battery

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00532 **Continued:**		

Power supply -Signal too small - This fault affects the voltage supply for the control unit. - This fault is only stored in memory if it occurs the first time the vehicle speed exceeds 6 km/h. - The system will be switched on again and the warning lamps will extinguish as soon as the supply voltage returns to the required level.	- Open circuit or excessive resistance in voltage supply wiring from terminal 15 to control unit -J104, contact 1. - Open wiring or excessive contact resistance in earth connection at control unit -J104, contact 28 and contact 29. - Loss of voltage in electrical system	- Function 08 "Read measured value block" => Page 97 , display group 6 Perform "Electrical check", Test step 21. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Check alternator and voltage regulator. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder Test battery => Electrical System; Repair group 27; Battery Battery

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
00597 Differing wheel speed impulses	- Wheels or tyre sizes not the same on all four wheels	- Check wheels and tyre sizes
	- Rotor dirty or damaged	- Check rotor. => Brake System; Repair group 45
	- Excessive play in wheel bearing	- Check wheel bearing => FWD and 4WD Running Gear; Repair group 40
	- Speed sensors -G44, -G45, -G46, -G47 incorrectly installed - Speed sensors -G44, -G45, -G46, -G47 defective.	- Check speed sensors. => Brake System; Repair group 45 Perform "Electrical check", Test steps 7 to 10.

V.A.G 1551 printer	Possible causes of fault	Fault remedy
00778 Steering angle sender -G85 No communication	- Open circuit or loose contact in the Data bus lines between sender for steering angle -G85 and control unit -J104	- Check fuses, wiring, connectors as well as voltage supply to control unit. =>Test step no. 13 => Page 123
	Check specified values from: - Steering angle sender -G85	- Function 08 Read measured value block =>Page 97 display group number 004
	- Steering angle sender -G85 defective	- Replace steering angle sender. => Brake System; Repair group 45 - Encode control unit -J104 => Page 93

V.A.G 1551 printer	Possible causes of fault	Fault remedy
00778 Steering angle sender -G85 no or wrong setting	- Sender for steering angle -G85 does not send any or wrong setting values	- Perform zero position compensation of steering angle sender => Page 93
00778 Steering angle sender -G85 Mechanical fault	- Installation position of sender for steering angle -G85 is not OK	- Check installation position of steering angle sender. => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
	- Running gear geometry is not OK - Steering wheel was removed and zero position compensation was not carried out.	- Perform vehicle alignment. => Running Gear, FWD; Repair group 44; Wheel alignment Wheel alignment - Perform zero position compensation => Page 93

V.A.G 1551 printer	Possible causes of fault	Fault remedy
00778 Steering angle sender -G85 Implausible signal	- Installation position of sender for steering angle -G85 is not OK - Zero position compensation not OK - Running gear geometry is not OK	- Check installation position of sender for steering angle. => Brake System; Repair group 45 - Perform vehicle alignment. => Running Gear, FWD; Repair group 44; Wheel alignment Wheel alignment - Perform zero position compensation => Page 93
00778 Steering angle sender -G85 Defective	- Steering angle sender -G85 defective	- Replace steering angle sender. => Brake System; Repair group 45 - Perform zero position compensation => Page 93

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01044 Control unit incorrectly encoded	- Control unit -J04 not or incorrectly coded.	- Encode control unit -J104, => Page 90
01119 Gear recognition signal	**Data transferred between control unit -J104 and gearbox control unit via CAN bus.** - A fault has been stored in the gearbox control unit.	Refer to section on "CAN bus", Page 8 . - Read out fault memory of gearbox control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of gearbox control unit.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01203 **ABS/dash panel insert electrical connection Open circuit/short circuit to earth Continued next page.**	- Open circuit in wiring from dash panel insert -218 to ABS control unit -J104. - Short to earth in wiring from dash panel insert -J218 to control unit -J104.	- Check wiring for standing time signal between dash panel insert -J218 and control unit -J104 (contact 86). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01203		

ABS/dash panel insert electrical connection Open circuit/short circuit to earth Continued:	- ABS control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If wiring is OK check TIM signal (standing time signal) on vehicles with automatic air conditioner both with control unit connected and disconnected using measured value blocks for air conditioner -J301. If air conditioner control unit -J301 signal is detected replace ABS control unit -J104. => Heating and Air Conditioner; Repair group 01
Continued next page.	- Dash panel insert -J218 defective. Note: Replacement of the control unit is always the final option.	- Replace dash panel insert -J218 if ABS control unit -J104 still does not recognise the TIM signal.

V.A.G 1551 printer **Fault code**	**Possible causes of fault**	**Fault remedy**
01203 **ABS/dash panel insert electrical consumer Open circuit/short circuit to earth Continued: Continued next page.**	- Control unit for air conditioner -J301 defective. Note: Replacement of the control unit is always the final option.	- If TIM signal is also not recognised by air conditioner control unit -J301 disconnect control unit -J301 and check TIM signal using measured value blocks for ABS control unit. Function 08 "Read measured value block" => Page 97 Replace air conditioner control unit -J301 if control unit -J104 now recognises TIM signal.

V.A.G 1551 printer **Fault code**	**Possible causes of fault**	**Fault remedy**
01203 **Continued:** ABS/dash panel insert electrical connection No signal	- Short to positive in wiring from dash panel insert -J218 to control unit -J104.	- Check wiring for standing time signal between dash panel insert -J218 and control unit -J104 (contact 86). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- ABS control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If wiring is OK check TIM signal (standing time signal) on vehicles with automatic air conditioner both with control unit connected and disconnected using measured value blocks for air conditioner -J301. If air conditioner control unit -J301 signal is detected replace ABS control unit -J104. => Heating and Air Conditioner; Repair group 01

V.A.G 1551 printer **Fault code**	**Possible causes of fault**	**Fault remedy**
01203		

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ABS/dash panel insert electrical connection No signal Continued:	- Control unit for air conditioner -J301 defective. Note: Replacement of the control unit is always the final option.	- If TIM signal is also not recognised by air conditioner control unit -J301 disconnect control unit -J301 and check TIM signal using measured value blocks for ABS control unit. Function 08 "Read measured value block" => Page 97 Replace air conditioner control unit -J301 if control unit -J104 now recognises TIM signal.
	- Dash panel insert -J218 defective. Note: Replacement of the control unit is always the final option.	- Replace dash panel insert -J218 if ABS control unit -J104 still does not recognise the TIM signal.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01314 Engine control unit Control difference	- The engine control unit is not able to reduce engine torque.	- Replace ESP control unit -J104 after consulting the service department of your Regional Sales Centre, or the relevant importer.
01316 Brake control unit Control difference	- ESP control function active for more than 5 seconds.	- Replace ESP control unit -J104 after consulting the service department of your Regional Sales Centre, or the relevant importer.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01418 Switch valve 1 for ESP -N225	- Open circuit or short to positive/earth in wiring between hydraulic unit -N55 and control unit -J104. - Switch valve 1 f.drive dyn.ctrl. (ESP) -N225 defective.	- Perform "Electrical check" =>Page 114 , Test step 5. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45
01419 Switch valve 2 for ESP -N226	- Open circuit or short to positive/earth in wiring between hydraulic unit -N55 and control unit -J104. - Switch valve 2 f.drive dyn.ctrl. (ESP) -N226 defective.	- Perform "Electrical check" =>Page 114 , Test step 5. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01420		

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High-pressure switch valve 1 for ESP -N227	- Open circuit or short to positive/ earth in wiring between hydraulic unit -N55 and control unit -J104. - High-pressure switch valve 1 for ESP -N227 defective.	- Perform "Electrical check" =>Page 114 , Test step 6. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45
01421 High-pressure switch valve 2 for ESP -N228	- Open circuit or short to positive/ earth in wiring between hydraulic unit -N55 and control unit -J104. - High-pressure switch valve 2 for ESP -N228 defective.	- Perform "Electrical check" =>Page 114 , Test step 6. If no fault is traced by performing the "Electrical check", test all wiring and connections for intermittent loose contacts. If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

8.4 - Fault table; fault codes from 01422 to 01425

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01422 ESP hydraulic pump -V156	- Insufficient supply voltage for ESP hydraulic pump -V156	- Perform "Electrical check" =>Page 114 , Test step 25.
	- Short to earth in wiring between ESP hydraulic pump -V156 and control unit -J104. - Voltage supply to control unit -J104 interrupted.	- Test wiring between ESP hydraulic pump -V156 and control unit -J104 for short to earth. Check the voltage supply wiring to control unit -J104. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Fuse defective	- Replace fuse 42. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01422 **ESP hydraulic pump -V156 Continued:**	- Short to earth in electronic ESP hydraulic pump -V156.	- Replace ESP hydraulic pump -V156 if no fault is found in wiring between -V156 and control unit -J104. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01422 **Continued:**		

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
ESP hydraulic pump -V156 Short to positive	- Open circuit in wiring between ESP hydraulic pump -V156 and control unit -J104.	- Test wiring between ESP hydraulic pump -V156 and control unit -J104 for open wiring.
Continued next page.	- Short to positive in wiring between ESP hydraulic pump -V156 and control unit -J104.	- Test wiring between ESP hydraulic pump -V156 and control unit -J104 for short to positive. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01422 **ESP hydraulic pump -V156 Short to positive Continued:**	- Open circuit or short to positive in electronic ESP hydraulic pump -V156.	- Replace ESP hydraulic pump -V156 if no fault is found in wiring between -V156 and control unit -J104. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01422 **Continued:** ESP hydraulic pump -V156 Open circuit/short circuit to earth	- Short to earth in wiring between ESP hydraulic pump -V156 and control unit -J104.	- Test wiring between ESP hydraulic pump -V156 and control unit -J104 for short to earth. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Short to earth in electronic ESP hydraulic pump -V156.	- Replace ESP hydraulic pump -V156 if no fault is found in wiring between -V156 and control unit -J104. => Brake System; Repair group 45
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault Note: Applies only to control unit no.: 4B0 907.389	Fault remedy
01423 Lateral acceleration sender -G200	- Installation position of lateral acceleration sender -G200 not as specified.	- Check installation position of lateral acceleration sender -G200. => Brake System; Repair group 45

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit no.: 4B0 907.389	
Continued next page.	- Open circuit in one of the voltage supply wires for lateral acceleration sender -G200	- Check earth connection between lateral acceleration sender -G200, contact 1 and control unit -J104, contact 19. Check voltage supply between lateral acceleration sender -G200, contact 3 and control unit -J104, contact 75. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit no.: 4B0 907.389	
01423 Lateral acceleration sender -G200 Continued:	- Open circuit in signal wire from lateral acceleration sender -G200 - Short to positive/earth in signal wire of lateral acceleration sender -G200.	- Check signal wire of lateral acceleration sender -G200, contact 2 and control unit -J104, contact 18. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Lateral acceleration sender -G200 defective	- If the fault is not caused by any of the conditions listed above, renew lateral acceleration sender -G200. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01423 Lateral acceleration sender -G200	- Installation position of lateral acceleration sender -G200 not as specified.	- Check installation position of lateral acceleration sender -G200. => Brake System; Repair group 45
Continued next page.	- Open circuit in one of the voltage supply wires for lateral acceleration sender -G200	- Check earth connection between lateral acceleration sender -G200, contact 2 and control unit -J104, contact 80. Check voltage supply between lateral acceleration sender -G200, contact 1 and control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01423		

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
Lateral acceleration sender -G200 Continued:	- Open circuit in signal wire from lateral acceleration sender -G200 - Short to positive/earth in signal wire of lateral acceleration sender -G200.	- Check signal wire of lateral acceleration sender -G200, contact 4 and control unit -J104, contact 18. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Lateral acceleration sender -G200 defective	- If the fault is not caused by any of the conditions listed above, renew lateral acceleration sender -G200. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit no.: 4B0 907 389	
01423 Lateral acceleration sender -G200 Electrical fault in circuit Continued:	- Open circuit in signal wire from lateral acceleration sender -G200 - Short to positive/earth in signal wire of lateral acceleration sender -G200.	- Check signal wire of lateral acceleration sender -G200, contact 2 and control unit -J104, contact 18. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Lateral acceleration sender -G200 defective	- If the fault is not caused by any of the conditions listed above, renew lateral acceleration sender -G200. => Brake System; Repair group 45

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit no.: 4B0 907 389	
01423 Continued: Lateral acceleration sender -G200 Electrical fault in circuit	- Open circuit in one of the voltage supply wires for lateral acceleration sender -G200	- Check earth connection between lateral acceleration sender -G200, contact 1 and control unit -J104, contact 19. Check voltage supply between lateral acceleration sender -G200, contact 3 and control unit -J104, contact 75. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Control unit -J104 defective Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01423		

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
Lateral acceleration sender -G200 Electrical fault in circuit Continued:	- Open circuit in signal wire from lateral acceleration sender -G200 - Short to positive/earth in signal wire of lateral acceleration sender -G200.	- Check signal wire of lateral acceleration sender -G200, contact 4 and control unit -J104, contact 18. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Lateral acceleration sender -G200 defective	- If the fault is not caused by any of the conditions listed above, renew lateral acceleration sender -G200. => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01423 Lateral acceleration sender -G200 Electrical fault in circuit Continued:	- Open circuit in one of the voltage supply wires for lateral acceleration sender -G200	- Check earth connection between lateral acceleration sender -G200, contact 2 and control unit -J104, contact 80. Check voltage supply between lateral acceleration sender -G200, contact 1 and control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Control unit -J104 defective Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01423 **Continued:** Lateral acceleration sender -G200 Implausible signal	**Note:** The input signals received by control unit -J104 are processed by internal programs and tested for plausibility. In the case of lateral acceleration sender -G200 the program mainly relies on the steering angle sensor -G85. If lateral acceleration sender -G200 is suspected to be the cause of the fault, then it must be ensured that steering angle sensor -G85 is working properly. This must also be checked. With vehicle moving in a straight line (v < 20 km/h) check zero position of steering angle sender -G85 by selecting function 08 "Read measured value block" => Page 101 .	
Continued next page.	**This test will give one of four possible results:**	

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01423 **Lateral acceleration sender -G200 Implausible signal Continued:**	Test result 1: Zero position of steering angle sender outside specified tolerance and zero position of lateral acceleration sender -G200 within specified tolerance.	

Continued next page.		- Perform zero position compensation => Page 95 If the fault is still present, perform test steps listed for test result 2.

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	**Note:** **Applies only to control unit no.: 4B0 907 389**	
01423 **Lateral acceleration sender -G200** **Implausible signal** **Continued:**	Test result 2: Zero position of steering angle sender within specified tolerance and zero position of lateral acceleration sender -G200 outside specified tolerance.	
	- Open circuit in signal wire from lateral acceleration sender -G200 - Short to positive/earth in signal wire of lateral acceleration sender -G200.	- Check signal wire of lateral acceleration sender -G200, contact 2 and control unit -J104, contact 18. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Control unit -J104 defective Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	**Note:** **Applies only to control unit no.: 4B0 907 389**	
01423 **Lateral acceleration sender -G200** **Implausible signal** **Continued: (Test result 2)**	- Open circuit in one of the voltage supply wires for lateral acceleration sender -G200	- Check earth connection between lateral acceleration sender -G200, contact 1 and control unit -J104, contact 19. Check voltage supply between lateral acceleration sender -G200, contact 3 and control unit -J104, contact 75. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Lateral acceleration sender -G200 defective	If none of the above is the cause of the problem then: Delete fault memory => Page 95 If fault is still present replace lateral acceleration sender -G200. => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01423 **Lateral acceleration sender -G200** **Implausible signal** **Continued:**	Test result 2: Zero position of steering angle sender within specified tolerance and zero position of lateral acceleration sender -G200 outside specified tolerance.	
	- Open circuit in one of the signal wires for the combined yaw rate and lateral acceleration sender. - Short to positive/earth in one of the signal wires of the combined yaw rate and lateral acceleration sender.	- Check signal wire between combined yaw rate and lateral acceleration sender, contact 4 and control unit -J104, contact 18. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01423 Lateral acceleration sender -G200 Implausible signal Continued: (Test result 2)	- Open circuit in one of the voltage supply wires for lateral acceleration sender -G200	- Check earth connection between lateral acceleration sender -G200, contact 2 and control unit -J104, contact 80. Check voltage supply between lateral acceleration sender -G200, contact 1 and control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Lateral acceleration sender -G200 defective	If none of the above is the cause of the problem then: Delete fault memory => Page 95 If fault is still present replace lateral acceleration sender -G200. => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code		
01423 Lateral acceleration sender -G200 Implausible signal Continued:	Test result 3: Zero position of steering angle sender outside specified tolerance and zero position of lateral acceleration sender -G200 outside specified tolerance. - Perform test steps 1 and 2.	
Continued next page.		

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code		
01423 Lateral acceleration sender -G200 Implausible signal Continued:	Test result 4: Zero position of steering angle sender within specified tolerance and zero position of lateral acceleration sender -G200 inside specified tolerance.	
	- Lateral acceleration sender -G200 defective	- Delete fault memory => Page 95 If fault is still present replace lateral acceleration sender -G200. => Brake System; Repair group 45
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy

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Fault code	Note: Applies only to control unit no.: 4B0 907 389	
01424	Fault readers V.A.G 1551 with tester card 7 and V.A.G 1552 with tester card 4 output the following incorrect text for control units 4B0 907 389: "Yaw rate sender -G202, ref. wire"	
Yaw rate sender -G202, signal wiring Electrical fault in circuit	- Open circuit in signal wire of yaw rate sender -G202. - Short to positive/earth in signal wire of yaw rate sender -G202.	- Check signal wire of yaw rate sender -G202, contact 3 to control unit -J104, contact 79. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Yaw rate sender -G202 defective	- If none of the above is the cause of the problem, then replace yaw rate sender -G202. => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit no.: 4B0 907 389	
01424	Fault readers V.A.G 1551 with tester card 7 and V.A.G 1552 with tester card 4 output the following incorrect text for control units 4B0 907 389: "Yaw rate sender -G202, ref. wire"	
Yaw rate sender -G202, signal wiring Electrical fault in circuit Continued:	- Open circuit in one of the voltage supply wires of the yaw rate sender -G202.	- Check earth connection of yaw rate sender -G202, contact 1 to control unit -J104, contact 80. Check voltage supply of yaw rate sender -G202, contact 2 to control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
Continued: 01424	Fault readers V.A.G 1551 with tester card 8 and V.A.G 1552 with tester card 5 output the following incorrect text for control units 8D0 907 389/A/D/E: "Yaw rate sender -G202, signal wiring".	
Yaw rate sender -G202, ref. wire Electrical fault in circuit	- Open circuit in reference wire of yaw rate sender -G202. - Short to positive/earth in reference wire of yaw rate sender -G202.	- Check reference wire of yaw rate sender -G202, contact 5 to control unit -J104, contact 78. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	Note: Reference wire of yaw rate sender -G202 transmits reference signal. The reference signal is equivalent to signal transmitted from sender to control unit -J104.	

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit no.: 4B0 907 389	

01425 Yaw rate sender -G202, ref. wire Electrical fault in circuit	**Fault readers V.A.G 1551 with tester card 7 and V.A.G 1552 with tester card 4 output the following incorrect text for control units 4B0 907 389: "Yaw rate sender -G202, signal wiring".** - Open circuit in reference wire of yaw rate sender -G202. - Short to positive/earth in reference wire of yaw rate sender -G202. Note: Reference wire of yaw rate sender -G202 transmits reference signal. The reference signal is equivalent to signal transmitted from sender to control unit -J104.	- Check reference wire of yaw rate sender -G202, contact 4 to control unit -J104, contact 78. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
Continued: 01425	Fault readers V.A.G 1551 with tester card 8 and V.A.G 1552 with tester card 5 output the following incorrect text for control units 8D0 907 389/A/D/E: "Yaw rate sender -G202, ref. wire"	
Yaw rate sender -G202, signal wiring Electrical fault in circuit	- Open circuit in one of the signal wires for the combined yaw rate and lateral acceleration sender. - Short to positive/earth in one of the signal wires of the combined yaw rate and lateral acceleration sender.	- Check signal wire between combined yaw rate and lateral acceleration sender, contact 6 and control unit -J104, contact 79. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Yaw rate sender -G202 defective	- If none of the above is the cause of the problem, then replace yaw rate sender -G202. => Brake System; Repair group 45

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01425	Fault readers V.A.G 1551 with tester card 8 and V.A.G 1552 with tester card 5 output the following incorrect text for control units 8D0 907 389/A/D/E: "Yaw rate sender -G202, ref. wire"	
Yaw rate sender -G202, signal wiring Electrical fault in circuit Continued:	- Open circuit in one of the voltage supply wires of the yaw rate sender -G202.	- Check earth connection of yaw rate sender -G202, contact 2 to control unit -J104, contact 80. Check voltage supply of yaw rate sender -G202, contact 1 to control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

8.5 - Fault table; fault codes from 01435 to 01542

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy

01435 Brake pressure sender -G201 **Continued next page.**	- The brake light switch is either incorrectly adjusted or incorrectly installed. - Open circuit in signal wire of brake pressure sender -G201. - Short to positive/earth in signal wire of brake pressure sender -G21.	- Check whether the brake light switch is correctly positioned. => Brake System; Repair group 45 97 , display group 5 - Check signal wire of brake pressure sender -G201, contact 2 to control unit -J104, contact 68. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01435 **Brake pressure sender -G201 Continued:** **Continued next page.**	- Brake pressure sender -G201 defective. - Open circuit in one of the voltage supply wires of the brake pressure sender -G201.	- If none of the above is the cause of the problem replace ESP hydraulic pump -V156 with brake pressure sender -G201. => Brake System; Repair group 45 - Check the earth supply of brake pressure sender -G201, contact 1, to control unit -J104, contact 67 (control unit 4B0 907 389), and/or contact 69 (control unit 8D0 809 389/A/D/E). Check the voltage supply of brake pressure sender -G201, contact 3, to control unit -J104, contact 69 (control unit 4B0 907 389), and/or contact 67 (control unit 8D0 907 389/A/D/E). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01435 **Brake pressure sender -G201 Continued:** **Continued next page.**	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01435 **Continued:** Brake pressure sender -G201 Electrical fault in circuit	- Open circuit in signal wire of brake pressure sender -G201. - Short to positive/earth in signal wire of brake pressure sender -G21.	- Check signal wire of brake pressure sender -G201, contact 2 to control unit -J104, contact 68. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Continued next page.	- Open circuit in one of the voltage supply wires of the brake pressure sender -G201.	- Check the earth supply of brake pressure sender -G201, contact 1, to control unit -J104, contact 67 (control unit 4B0 907 389), and/or contact 69 (control unit 8D0 809 389/A/D/E). Check the voltage supply of brake pressure sender -G201, contact 3, to control unit -J104, contact 69 (control unit 4B0 907 389), and/or contact 67 (control unit 8D0 907 389/A/D/E). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01435 **Brake pressure sender -G201 Electrical fault in circuit Continued:**	- Brake pressure sender -G201 defective.	- If none of the above is the cause of the problem replace ESP hydraulic pump -V156 with brake pressure sender -G201. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01435 **Continued:** **Brake pressure sender -G201 Implausible signal**	- ESP hydraulic pump -V156 has been activated and does not build up pressure between 2 bar and 30 bar in brake master cylinder.	- Delete fault memory => Page 95 If fault is still present replace ESP hydraulic pump -V156 with brake pressure sender -G201. => Brake System; Repair group 45
01435 **Brake pressure sender -G201 Implausible signal**	- Brake master cylinder defective.	- Check and if necessary replace brake master cylinder. => Brake System; Repair group 47
	- Brake servo defective	- Check and if necessary replace brake servo. => Brake System; Repair group 47

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01435 **Continued:**		

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Brake pressure sender -G201 - Voltage supply	- Short to positive in voltage supply. - Short to earth in voltage supply. - Open circuit in one of the voltage supply wires of the brake pressure sender -G201.	- Check the earth supply of brake pressure sender -G201, contact 1, to control unit -J104, contact 67 (control unit 4B0 907 389), and/or contact 69 (control unit 8D0 809 389/A/D/E). Check the voltage supply of brake pressure sender -G201, contact 3, to control unit -J104, contact 69 (control unit 4B0 907 389), and/or contact 67 (control unit 8D0 907 389/A/D/E). => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01464	If this fault is detected by the self-diagnosis, then no distinction has been made between the voltage supply for brake pressure sender -G201 and the voltage supply for lateral acceleration sender -G200. Both components and the corresponding wiring should be checked.	
Sender for brake pressure/lateral acceleration Voltage supply	- Voltage supply for brake pressure sender -G201 is insufficient.	- Check the voltage supply wiring between brake pressure sender -G201, contact 3 and control unit -J104, contact 69 for short to earth and short to positive.
Continued next page.	- Voltage supply for lateral acceleration sender -G200 is insufficient.	- Check the voltage supply wiring between lateral acceleration sender -G200, contact 3 and control unit -J104, contact 75 for short to earth and short to positive.

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01464	If this fault is detected by the self-diagnosis, then no distinction has been made between the voltage supply for brake pressure sender -G201 and the voltage supply for lateral acceleration sender -G200. Both components and the corresponding wiring should be checked.	
Sender for brake pressure/lateral acceleration Voltage supply Continued:	- One of the two senders is faulty.	If no fault can be found with the voltage supply wiring: Delete fault memory => Page 5 Ignition off. Disconnect the two senders in turn. If the fault no longer occurs after turning the ignition on, replace the disconnected sender. => Brake System; Repair group 45
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault Note: this fault is not present in fault readers V.A.G 1551/52.	Fault remedy
01486 System function test activated	- ESP system test activated.	- Perform the ESP driving and system test in full => Page 95

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01542 Yaw rate sender -G202 Implausible signal	The input signals received by control unit -J104 are processed by internal programs and tested for plausibility. In the case of yaw rate sender -G202, the program mainly relies on the steering angle sender -G85 and the lateral acceleration sender -G200. If the yaw rate sender -G202 is suspected of being the cause of the problem a check must be made to ensure that the steering angle sender -G85 and the lateral acceleration sender -G200 are functioning properly. They must also be checked. With vehicle moving in a straight line (v < 20 km/h) check zero position of steering angle sender -G85 by selecting function 08 "Read measured value block", => Page 97 , display group 5.	
Continued next page.	**This test will give one of four possible results:**	

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01542 **Yaw rate sender -G202 Implausible signal Continued:**	Test result 1: (also refer to test result 4): Zero position of steering angle sender outside specified tolerance and zero position of yaw rate sender within specified tolerance.	
Continued next page.		- Perform zero position compensation. =>Page 7 If the fault is still present, perform test steps listed for test result 2.

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V.A.G 1551 printer Fault code	Possible causes of fault **Note: Applies only to control unit no.: 4B0 907.389**	Fault remedy
01542 **Yaw rate sender -G202 Implausible signal Continued:**	Test result 2: (also refer to test result 4): Zero position of steering angle sender within specified tolerance and zero position of yaw rate sender -G202 outside specified tolerance.	
Continued next page.	- Open circuit in signal wire of yaw rate sender -G202. - Short to positive/earth in signal wire of yaw rate sender -G202.	- Check signal wire of yaw rate sender -G202, contact 3 to control unit -J104, contact 79. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault **Note: Applies only to control unit no.: 4B0 907.389**	Fault remedy
01542 **Yaw rate sender -G202 Implausible signal Continued: (Test result 2) Continued next page.**	- Open circuit in one of the voltage supply wires of the yaw rate sender -G202.	- Check earth connection of yaw rate sender -G202, contact 1 to control unit -J104, contact 80. Check voltage supply of yaw rate sender -G202, contact 2 to control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01542		

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Yaw rate sender -G202 Implausible signal Continued: (Test result 2)	- Yaw rate sender -G202 defective	If none of the above is the cause of the problem then: Delete fault memory => Page 7 If fault is still present replace yaw rate sender -G202. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01542 **Yaw rate sender -G202 Implausible signal Continued:**	Test result 2: (also refer to test result 4): Zero position of steering angle sender is inside specified tolerance and zero position of lateral acceleration sensor -G200 is outside specified tolerance:	
	- Open circuit in one of the signal wires for the combined yaw rate and lateral acceleration sender. - Short to positive/earth in one of the signal wires of the combined yaw rate and lateral acceleration sender.	- Check signal wire between combined yaw rate and lateral acceleration sender, contact 4 and control unit -J104, contact 18. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01542 **Yaw rate sender -G202 Implausible signal Continued: (Test result 2) Continued next page.**	- Open circuit in one of the voltage supply wires for the combined yaw rate and lateral acceleration sender.	- Check earth connection between combined yaw rate and lateral acceleration sender, contact 2 and control unit -J104, contact 80. Check voltage supply between combined yaw rate and lateral acceleration sender, contact 1 and control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01542 **Yaw rate sender -G202 Implausible signal Continued: (Test result 2)**	- Combined yaw rate and lateral acceleration sender is defective.	If none of the above is the cause of the problem then: Delete fault memory => Page 7 If fault is still present replace combined yaw rate and lateral acceleration sender if fault is still present. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01542 **Yaw rate sender -G202 Implausible signal Continued:** **Continued next page.**	Test result 3: (also refer to test result 4): Zero position of steering angle sender is outside specified tolerance and zero position of lateral acceleration sensor -G200 is outside specified tolerance: - Perform test steps 1 and 2.	

V.A.G 1551 printer Fault code	Possible causes of fault Note: Applies only to control unit no.: 4B0 907 389	Fault remedy
01542 **Yaw rate sender -G202 Implausible signal Continued:**	Test result 4: Zero position of steering angle sender within specified tolerance and zero position of lateral acceleration sender -G200 inside specified tolerance. - Check yaw rate sender -G202 by selecting function 08 "Read measured value block", => Page 97, display group 5;	
Continued next page.	- Yaw rate sender -G202 is loose.	- Check mounting of yaw rate sender -G202. => Brake System; Repair group 45
	- Open circuit in signal wire of yaw rate sender -G202. - Short to positive/earth in signal wire of yaw rate sender -G202.	- Check signal wire of yaw rate sender -G202, contact 3 to control unit -J104, contact 79. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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V.A.G 1551 printer Fault code	Possible causes of fault Note: Applies only to control unit no.: 4B0 907 389	Fault remedy
01542 Yaw rate sender -G202 Implausible signal **Continued: (Test result 4)** **Continued next page.**	- Open circuit in one of the voltage supply wires of the yaw rate sender -G202. - Open circuit in test wire of yaw rate sender -G202. - Short to positive/earth in test wire of yaw rate sender -G202.	- Check earth connection of yaw rate sender -G202, contact 1 to control unit -J104, contact 80. - Check voltage supply of yaw rate sender -G202, contact 2 to control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder - Check test wire of yaw rate sender -G202, contact 5 to control unit -J104, contact 77. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault Note: Applies only to control unit no.: 4B0 907 389	Fault remedy
01542 **Yaw rate sender -G202 Implausible signal Continued: (Test result 4)**	- Yaw rate sender -G202 defective	If none of the above is the cause of the problem then: Delete fault memory => Page 95 If fault is still present replace yaw rate sender -G202. => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit no.: 4B0 907 389	
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01542 Yaw rate sender -G202 Implausible signal Continued:	Test result 4: Zero position of steering angle sender is inside specified tolerance and zero position of combined yaw rate and lateral acceleration sender is inside specified tolerance: - Check combined yaw rate and lateral acceleration sender by selecting function 08 "Read measured value block", => Page 97 , display group 5	
Continued next page.	- Combined yaw rate and lateral acceleration sender is loose.	- Check mounting of combined yaw rate and lateral acceleration sender. => Brake System; Repair group 45

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01542 Yaw rate sender -G202 Implausible signal Continued: (Test result 4) Continued next page.	- Open circuit in one of the voltage supply wires for the combined yaw rate and lateral acceleration sender.	- Check earth connection between combined yaw rate and lateral acceleration sender, contact 2 and control unit -J104, contact 80. Check voltage supply between combined yaw rate and lateral acceleration sender, contact 1 and control unit -J104, contact 34. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01542 Yaw rate sender -G202 Implausible signal Continued: (Test result 4)	- Open circuit in one of the signal wires for the combined yaw rate and lateral acceleration sender. - Short to positive/earth in one of the signal wires of the combined yaw rate and lateral acceleration sender.	- Check signal wire between combined yaw rate and lateral acceleration sender, contact 6 and control unit -J104, contact 79. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued next page.	- Open circuit in test wire of combined yaw rate and lateral acceleration sender. - Short to positive/earth in test wire of the combined yaw rate and lateral acceleration sender.	- Check test wire between combined yaw rate and lateral acceleration sender, contact 3 and control unit -J104, contact 77. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Fault code	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
01542		

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
	Note: Applies only to control unit nos.: 8D0 907 389, 8D0 907 389A, 8D0 907 389D and 8D0 907 389E.	
Yaw rate sender -G202 Implausible signal Continued: (Test result 4)	- Combined yaw rate and lateral acceleration sender is defective.	If none of the above is the cause of the problem then: Delete fault memory => Page 95 If fault is still present replace combined yaw rate and lateral acceleration sender if fault is still present. => Brake System; Repair group 45
Continued next page.	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
01542 Yaw rate sender -G202 Defective	- Open circuit in test wire of yaw rate sender -G202. - Yaw rate sender -G202 defective	- Check test wire of yaw rate sender -G202, contact 5 to control unit -J104, contact 77. Replace yaw rate sender -G202. => Brake System; Repair group 45
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

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8.6 - Fault table; fault codes from 18031 to 65535

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18031	Check the communications on the CAN bus by selecting function 08 "Read measured value block", => Page 97 , display group 125	
CAN bus - no communication	Data transfer between control unit -J104 engine control unit and gearbox control unit as well as between control unit -J04 and steering angle sender -G85 are transferred via CAN bus.	- Check CAN bus by selecting function 08 "Read measured value block", => Page 97 , display group 125
Continued next page.	- Control unit -J104 is not connected to data bus wires.	- Check whether control unit -J104 is connected to data bus wires. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18031 CAN bus - no communication Continued:	- Open circuit in both bus wires to the above-mentioned components immediately downstream of control unit -J104.	- Check bus wires => Page 10 .

Continued next page.	- CAN bus low and high wires interchanged.	- Check for interchanged wires. The control unit can neither receive or transmit signals if the wires are interchanged. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18031 CAN bus - no communication Continued:	- None of the above-mentioned components which communicate with control unit -J104 via the CAN bus are connected to the data bus wiring.	- Check whether engine control unit, gearbox control unit and steering angle sender -G85 are connected. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18034	Check the communications on the CAN bus by selecting function 08 "Read measured value block", => Page 97 , display group 125	
	- The gearbox control unit is not connected.	- Check whether gearbox control unit is connected => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations
Continued next page.	- Gearbox control unit without CAN bus output is installed.	- Refer to Parts list and check correct Part No. for vehicle.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18034 CAN bus - no message from gearbox control unit Continued:	- Inadequate voltage supply to gearbox control unit.	- Read out fault memory of gearbox control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of gearbox control unit.
	- Fault in bus wiring	- Check bus wires => Page 10
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18036	Check the communications on the CAN bus by selecting function 08 "Read measured value block", => Page 97 , display group 125	

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V.A.G 1551 printer	Possible causes of fault	Fault remedy
Continued next page.	- Short to earth in voltage supply for steering angle sender -G85, contact 4 to control unit -J104, contact 2. - Short to positive in voltage supply for steering angle sender -G85, contact 1. - Open circuit or excessive contact resistance in one of the voltage supply wires for the steering angle sender -G 85.	- Check voltage supply wires of steering angle sender -G85. Voltage supply via terminal 30. => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18036 CAN bus - no message from steering angle sender	- Fault in bus wiring	- Check bus wires => Page 9 => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
Continued:	- The sender for steering angle -G85 is defective.	- If none of the above is the cause of the problem, then replace "steering angle sender" -G85. => Brake System; Repair group 45
	- Control unit -J104 defective. Note: Replacement of the control unit is always the final option.	- If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18055	- Encoding of control unit -J104 does not match encoding of engine control unit -J220 (petrol engines) or -J338 (diesel engines). - Encoding of control unit -J104 does not match encoding of automatic gearbox control unit -J217 (vehicles with automatic gearbox only).	- Check encoding of control unit -J104. Check encoding of engine control unit -J220 (petrol engines) or -J338 (diesel engines). Check encoding of gearbox control unit -J217 (vehicles with automatic gearbox only).

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18256	- A fault has been stored in the engine control unit.	- Read out fault memory of engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.
	- Fault in bus wiring	- Check bus wires => Page 10

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18258	Check the communications on the CAN bus by selecting function 08 "Read measured value block", => Page 97 , display group 125	
	- The engine control unit is not connected.	- Check whether engine control unit is connected => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

V.A.G 1551 printer	Possible causes of fault	Fault remedy
Continued next page.	- Inadequate voltage supply to engine control unit.	- Read out fault memory of engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18258 CAN bus - no message from engine control unit Continued:	- Engine control unit without CAN bus output is installed. - Fault in bus wiring - Control unit -J104 defective Note: Replacement of the control unit is always the final option.	- Refer to Parts list and check correct Part No. for vehicle. - Check bus wires => Page 10 - If the fault cannot be traced by any of these steps, renew control unit -J104 => Brake System; Repair group 45

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V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18262	Check the communications on the CAN bus by selecting function 08 "Read measured value block", => Page 97 , display group 125	
Continued next page.	- Bus wiring fault between control unit -J104, engine control unit, gearbox control unit or steering angle sender. Control units are not able to communicate.	- Check bus wires => Page 10 .

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18262 **CAN bus hardware defective** **Continued:**	Data transfer between control unit -J104 engine control unit and gearbox control unit as well as between control unit -J04 and steering angle sender -G85 are transferred via CAN bus. - Bus wiring fault between control unit -J104 and steering angle sender -G85. Control units are not able to communicate.	Refer to section on "CAN bus", Page 8 .

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18263	- Software version of control unit -J104 responsible for CAN bus does not match that of engine control unit.	- Check part numbers of control units fitted by way of function 01 "Interrogate control unit version" => Page 89 . Refer to parts list and check correct Part no. for vehicle.
18264	- A fault has been stored in the engine control unit.	- Read out fault memory of engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.
18265		

	- A fault has been stored in the engine control unit.	- Read out fault memory of engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.

V.A.G 1551 printer Fault code	Possible causes of fault	Fault remedy
18266	- A fault has been stored in the engine control unit.	- Read out fault memory of engine control unit. Eliminate fault in line with appropriate gearbox Workshop Manual and erase fault memory of engine control unit.
65535 Control unit	- Control unit defective	- Replace control unit. In this case the fault memory is not to be erased. The data stored in the fault memory aid the detection of the damage in the control unit. This data is used for the continuous improvement of the product.

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