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ABS/EDL/TCS Bosch 5.3 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.

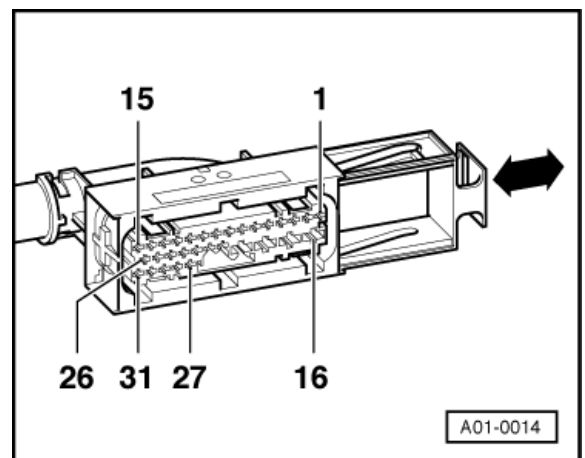
- Switch ignition and electrical consumers off before commencing the check (headlights, lighting, fan, etc.).

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

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→ **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

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

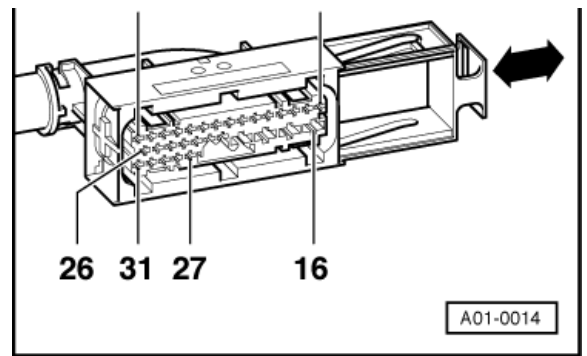
- ◆ The socket descriptions of test box V.A.G 1598 are identical to the contact descriptions of control unit -J104 in the current flow diagram. Incorrect test procedures can cause system damage. Do not make connections between any contacts other than those listed in the test table.

=> 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.

- ◆ 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 ▪ Brake pedal not operated Brake pedal operated	0.0 - 0.5 V 10.0 - 14.5 V	- Check wiring from contact 19 to earth. - Check wiring from terminal 14 via fuse (10A) to terminal 30.

Switch on measuring range: Resistance measurement (2 k ω)					
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			- Test electrical wiring between control unit and speed sensor for open circuit, short to earth or short to positive.
5	6 + 7 (all	Resistance of speed sensor front	▪ Ignition switched off	400 ω /2300 ω	- Check plug connections. Move wiring during check (Loose contact). => Current Flow Diagrams, Electrical Fault-finding and Fitting

	versions)	left -G47			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 k Ω)					
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	▪ Ignition switched off	400 Ω /2300 Ω	- Check electric wiring between control unit and speed sensor for open circuit and short to earth or positive. - 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.
7	8 + 9 (all versions)	Resistance of speed sensor rear left -G46			

- 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.

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
8	-	Function of ABS/EDL warning	- Switch on ignition.	Warning lamp - K47 is lit up for 2 seconds	- 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

Continued:		lamp - K47.		and then goes out again.	"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 <u>- 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</u>
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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"	▪ <u>Brake fluid level OK</u>		
Test step 9: Continued on next page.					

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.	<u>- Fault in dash panel insert</u>

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
					- 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

10 Continued:	-	Function of TCS warning lamp - K86	- Switch on ignition.	Warning lamp -K86 should light up for 2 seconds and then extinguish.	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 <u>- 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</u>
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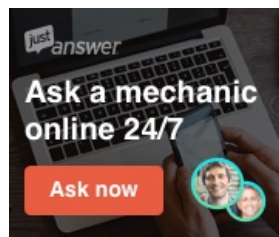
Functional check: TCS switch, select measuring range on V.A.G 1526: 20 V =					
Test step	V.A.G 1598 socket	Testing of	▪ Test conditions - Additional operations	Specified value	Action in the event of deviation from specified value
11	-	Function of TCS switch	▪ Ignition switched off ▪ Function of TCS warning lamp - K86 checked in test step 10. ▪ Multi-pin connector connected to control unit -J104 and engaged. Switch on ignition. - Operate TCS switch. - Press TCS switch again.	TCS warning lamp -K86 illuminates. TCS warning lamp -K86 goes out.	- Switch off the ignition. Release multiple connector from control unit -J104 and detach. - Connect test box V.A.G 1598 with adapter cable V.A.G 1598/27.
Test step 11: Continued on next page.					

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 - TCS switch pressed	0.0 - 0.5 V 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.

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