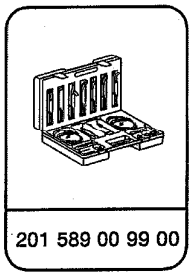
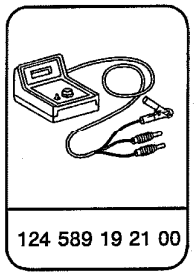
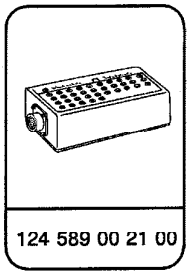
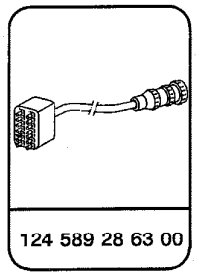
Fault readout via Diagnostic Trouble Code (DTC)

Special tools


201 589 00 99 00


124 589 19 21 00


124 589 00 21 00

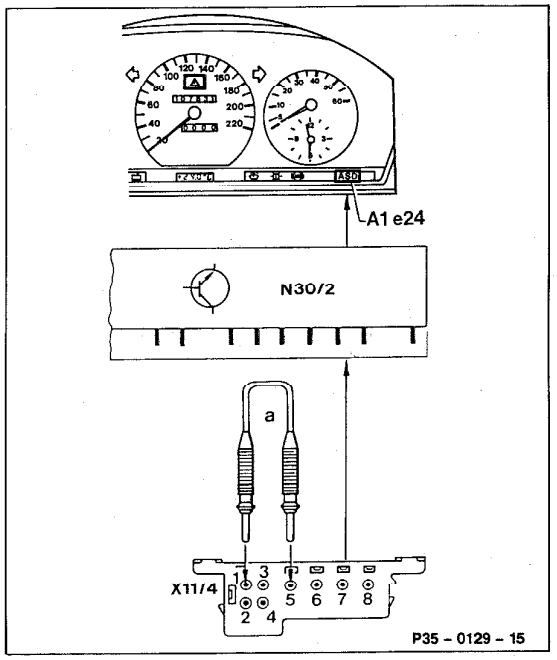

124 589 28 63 00

Commercially available tools

Multimeter	e.g. Sun DMM-5

Diagnostic program

A diagnostic program is integrated into the ASD control module (N30/2) for monitoring the electronic circuit. Upon recognition of a malfunction the ASD Malfunction Indicator Lamp (MIL) (A1e24) illuminates while riding. The fault stored can be read out as a Diagnostic Trouble Code (DTC) with the ASD MIL (A1e24) or the impulse counter scan tool. The number of flashes indicates which electric circuit is defective (see table: "Diagnostic Trouble Code").



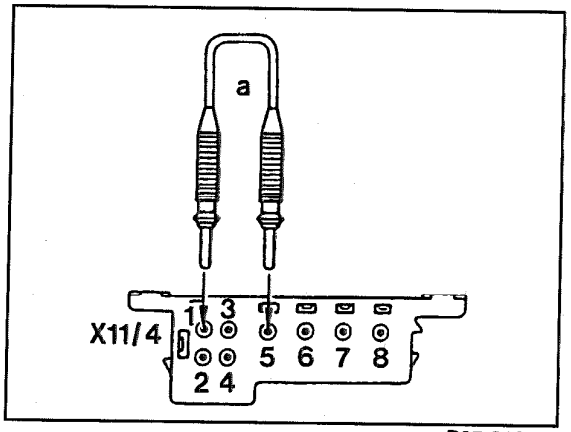
P35-0129-15

a Line with plug
A1e24 Malfunction Indicator Lamp, ASD/4MATIC
N30/2 ASD control module
X11/4 Data link connector (DTC readout)

Output of diagnostic trouble code via ASD Malfunction Indicator Lamp (MIL)

1 Allow engine to run.

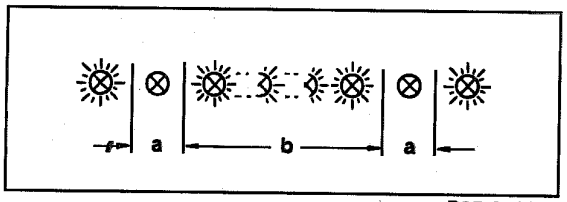
2 Jumper sockets 1 and 5 in data link connector (X11/4) with plug from 201 589 00 99 00 (a) for approx. 1 second.



P35-0181-13

Note
After disconnecting the MIL extinguishes for approx. 2 seconds (a) and then starts flashing regularly with an interval of approx. 1 second (b).

3 Read off diagnostic trouble code (b) on MIL. After output of the codes the MIL illuminates continuously.



P35-0130-11

Arrangement of flash impulses
a Pause approx. 2 seconds
b Number of diagnostic trouble code e.g. "4"

Cancelling the diagnostic trouble code

After eliminating the malfunction, the stored diagnostic trouble code must then be erased.

4 Allow engine to run.

5 Perform items 2 and 3 again.

Note
The fault must be read out again at least once immediately before deleting.

6 Jumper sockets 1 and 5 in test coupling for at least 10 seconds. The MIL extinguishes indicating that the stored code has been deleted correctly.

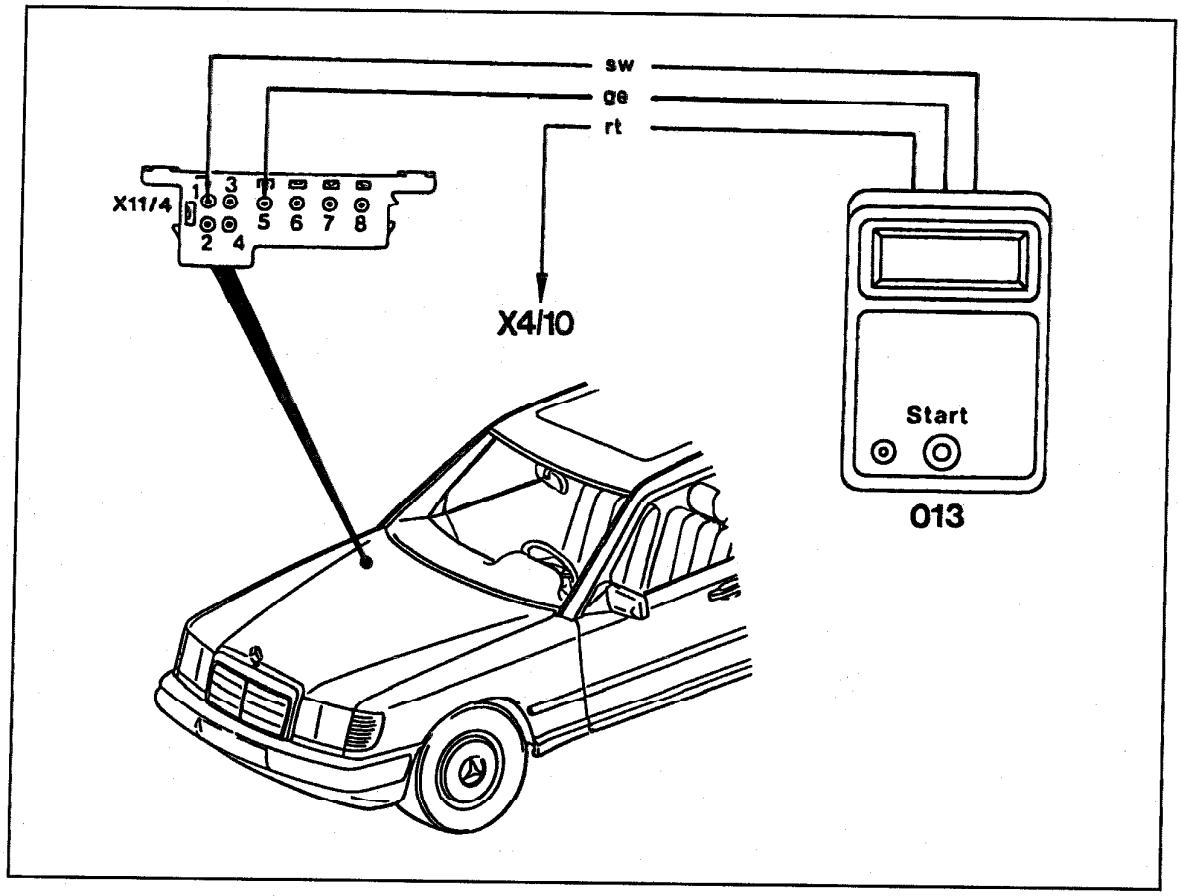
Output of diagnostic trouble code via impulse counter scan tool

1 Connect impulse counter scan tool 124 589 19 21 00.

2 Allow engine to run.

3 Press "Start" key for 1 second to read off malfunction diagnostic trouble code, 10 seconds to delete.

Note
The malfunction must be read out again at least once immediately before deleting.



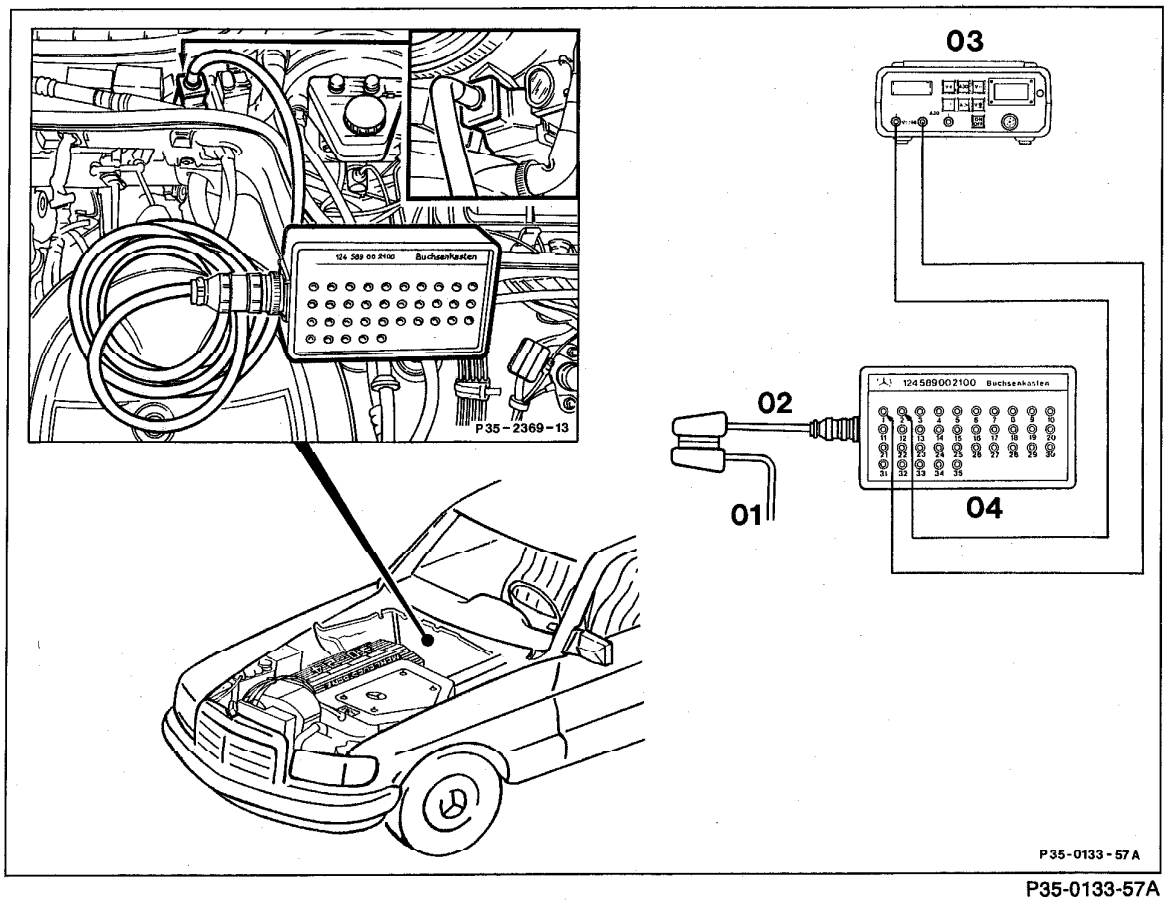
P35-0132-57

Connection schematic, impulse counter scan tool

013	Impulse counter scan tool 124 589 19 21 00
X4/10	Terminal block (circuit 30/circuit 61 battery) (3-pole)
X11/4	Data link connector (DTC readout)

Diagnostic Trouble Codes (DTCs)

Number of flash pulses	Malfunction
1	No malfunction
2	ASD control module (N30/2) defective
3	Brake light switch (S9/1); ASD switching function defective – rest circuit
4	Speed impulse, front left missing; contact interruption
5	Speed impulse, front right missing; contact interruption
6	Speed impulse, rear missing; contact interruption
7	All three speed impulses missing
8	ASD valve (Y38), relay overvoltage protection (K1/2) or brake light switch (S9/1); switching function brake light defective – operating circuit



P35-0133-57A

Connection schematic, socket box

01	Coupling, ASD control module
02	Test cable 124 589 28 63 00
03	Multimeter
04	Socket box 124 589 00 21 00

Prerequisites for testing

- Check fuse 7 terminal 15 in fuse box.
- Check fuses, relay, overvoltage protection.
- Check battery voltage (11-14 V), charge battery if required.
- Disconnect ASD control module (N30/2).
- Connect test cable 124 589 28 63 00 and socket box 124 589 00 21 00 to cable harness.

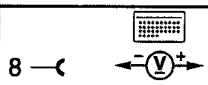
Test step/DTC 1

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
–	–	–	–	No fault in system

Test step/DTC 2

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
–	–	–	–	Exchange ASD control module (N30/2) (35-512)

Test step/DTC 3

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check brake light switch (S9/1) rest circuit	 8 — V — 10	Ignition: **ON** Ignition: **OFF**	>11 V approx. 0 V	Exchange brake light switch (S9/1)
	S9/1 1 — Ω — 2	Ignition: **OFF** Brake actuated	∞ Ω	
	⊥ — V — N30/2 — 10	Ignition: **ON**	>11 V	
	⊥ — V — N30/2 — 11	Ignition: **ON**	approx. 0 V	

Test step/DTC 4

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check speed sensor, front left wheel (L6/1)	9 — V — 5	Ignition: **ON** Turn wheel 1/s	approx. 4 V	Line from ASD control module (N30/2) socket 9 to battery ground (W10) interrupted. Distance between speed sensor-rotor too great. Speed sensor dirty.
	N30 17 — Ω — N30/2 5	Ignition: **OFF**	<1 Ω	Line from ASD control module (N30/2) socket 5 to ABS control module (N30) socket 17 interrupted.
	N30 6 — Ω — L6/1x1 2	Ignition: **OFF**	<1 Ω	Line from ABS control module (N30/2) socket 6 to plug connector for speed sensor, left front wheel (L6/1x1) interrupted.
	N30 4 — Ω — L6/1x1 1	Ignition: **OFF**	<1 Ω	Line from ABS control module socket 4 to plug connector, speed sensor, left front wheel (L6/1x1) interrupted.
	L6/1x1 1 — Ω — 2	Ignition: **OFF**	0.85–2.3 kΩ	Speed sensor (L6/1) interrupted.
	L6/1x1 1 — Ω — L6/1 ⊥	Ignition: **OFF**	∞ Ω	Speed sensor (L6/1) short-circuited to ground.

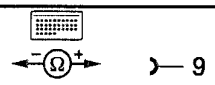
Test step/DTC 5

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check speed sensor, front right wheel (L6/2)	 9 — (— V —) — 3	Ignition: **ON** Turn wheel 1/s	approx. 4 V	Line from ASD control module (N30/2) socket 9 to battery ground (W10) interrupted. Distance between speed sensor-rotor too great. Speed sensor dirty.
	N30 11 — (— Ω —) — N30/2 3	Ignition: **OFF**	<1 Ω	Line from ASD control module (N30/2) socket 3 to ABS control module (N30) socket 11 interrupted.
	N30 23 — (— Ω —) — L6/2x1 2	Ignition: **OFF**	<1 Ω	Line from ABS control module socket 23 to plug connector, speed sensor, right front wheel (L6/2x1) interrupted.
	N30 21 — (— Ω —) — L6/2x1 1	Ignition: **OFF**	<1 Ω	Line from ABS control module socket 21 to plug connector for speed sensor, right front wheel (L6/2x1) interrupted.
	L6/2x1 1 — (— Ω —) — 2	Ignition: **OFF**	0.85–2.3 kΩ	Speed sensor (L6/2) interrupted.
	L6/2x1 1 — (— Ω —) — L6/2 ⊥	Ignition: **OFF**	∞ Ω	Speed sensor (L6/2) short-circuited to ground.

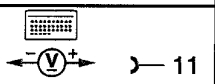
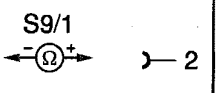
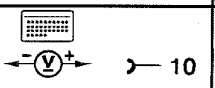
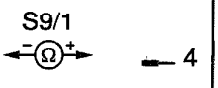
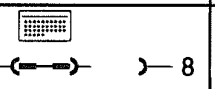
Test step/DTC 6

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check speed sensor, rear axle (L6)	9 — (V) — 1	Ignition: **ON** Shift to neutral, turn wheel 1/s	approx. 4 V	Line from ASD control module (N30/2) socket 9 to battery ground (W10) interrupted. Interval between speed sensor-rotor too great. Speed sensor dirty.
	N30 30 — (Ω) — N30/2 1	Ignition: **OFF**	< 1 Ω	Line from ASD control module (N30/2) socket 1 to ABS control module (N30) socket 30 interrupted.
	N30 7 — (Ω) — L6x1 1	Ignition: **OFF**	< 1 Ω	Line from ABS control module (N30) to first plug connector (X47) or from plug connector (X47) to second plug connector (L6x1) interrupted.
	N30 9 — (Ω) — L6x1 2	Ignition: **OFF**	< 1 Ω	Line from ABS control module (N30) to first plug connector (X47) or from plug connector (X47) to second plug connector (L6x1) interrupted.
	1 — L6x1 (Ω) — 2	Ignition: **OFF**	0.65–2.3 kΩ	Speed sensor (L6) interrupted.
	L6x1 1 — (Ω) — L6 ⊥	Ignition: **OFF**	∞ Ω	Speed sensor (L6) short-circuited to ground.

Test step/DTC 7

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check line continuity from ASD control module (N30/2) to battery ground (W10) (all three speed impulses missing)		Ignition: **OFF**	<1 Ω	Line from socket 8 and socket 9 to battery ground (W10) interrupted. ABS control module defective or wrong control module installed.

Test step/DTC 8

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check brake light switch, ASD (S9/1) operating circuit		Ignition: **ON** Brakes actuated	approx. 0 V >11 V	Line from socket 11 ASD control module (N30/2) to brake light switch (S9/1) via line connector (X21/2) interrupted.
		Ignition: **OFF** Brake not actuated	∞ Ω	Exchange brake light switch (S9/1).
Check brake light switch (S9/1) rest circuit		Ignition: **ON** Brake actuated	>11 V approx. 0 V	Exchange brake light switch (S9/1).
		Ignition: **OFF** Brake not actuated	<1 Ω	Exchange brake light switch (S9/1).
Check ASD valve (Y38) function		Ignition: **ON**	ASD valve switches	Line from socket 10 on ASD control module (N30/2) via plug connector X62/5 and Y38x1 to ASD valve (Y38) interrupted.

Test step/DTC 8 (continued)

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check ASD valve (Y38) function	Y38 1 — Ω — 2	Ignition: **OFF** Plug disconnected	5.7–6.1 Ω or ∞ Ω	Value for continuity test 5.6–6.1 Ω. For ground short test ∞ Ω. If these values are not measured, ASD valve (Y38) is defective.
	Y38x1 2 — Ω — S9/1 3	Ignition: **OFF**	<1 Ω	Line from plug connector, ASD valve (Y38x1) via plug connectors (X62/5) to brake light switch (S9/1) interrupted.
	K1/2 9 — Ω — S9/1 4	Ignition: **OFF**	<1 Ω	Line from brake light switch (S9/1) to relay, overvoltage protection (K1/2) terminal 87L interrupted.
	⊥ — V — K1/2 1	Ignition: **ON**	>11 V	Line between battery and relay, overvoltage protection (K1/2) via line connector (X4/10) interrupted.
	⊥ — V — K1/2 3	Ignition: **ON**	>11 V	Line between ignition lock and relay, overvoltage protection (K1/2) interrupted.
	K1/2 5 — V — W10	Ignition: **ON**	>11 V	Line between battery ground (W10) and relay, overvoltage protection (K1/2) interrupted.
	⊥ — V — S9/1 4	Ignition: **ON** Overvoltage protection (K1/2) connected	>11 V	If the value is not measured, relay, overvoltage protection (K1/2) defective.

Fault recognition via warning lamp and MIL, which cannot be read out via stored diagnostic trouble code

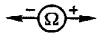
Complaint-related troubleshooting chart

Complaint	Possible cause	Repair instructions
Warning lamp (A1e25) does not illuminate, MIL (A1e24) illuminates with ignition: **ON**	Line between ASD control module (N30/2) and warning lamp (A1e25), bulb, electronic stage of warning lamp, ASD control module (N30/2) defective.	Test step 1
Warning lamp (A1e25) does not change brightness when parking lights and low-beam headlights are switched on. Ignition: **ON**	Electronic stage of warning lamp (A1e25) defective.	Test step 2
MIL (A1e24) does not illuminate, warning lamp (A1e25) illuminates. Ignition: **ON**	Line between ASD control module (N30/2) and MIL (A1e24), bulb, ASD control module defective.	Test step 3
Warning lamp (A1e25) and MIL (A1e24) illuminate continuously – engine running	Line between ASD control module (N30/2) and terminal 61e interrupted. No voltage at terminal 61e, ASD control module defective.	Test step 4 If voltage is not present at terminal 61e, this can also be seen on the charging indicator therefore check line or alternator, regulator. Replace ASD control module (N30/2).
Warning lamp (A1e25) and MIL (A1e24) do not illuminate. Ignition: **ON**	Lines interrupted. ASD control module (N30/2) or relay, overvoltage protection (K1/2) defective.	Test step 5

Test step 1

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check warning lamp (A1e25) for proper function	N30/2 4 —  A1e25 — 1	Ignition: **OFF**	<1 Ω	Line between socket 4 on ASD control module (N30/2) to electronic stage or warning lamp (A1e25) interrupted. Bulb defective. Electronic stage of warning lamp defective.

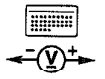
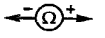
Test step 2

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check warning lamp (A1e25) for brightness adjustment	A1e25 3 —  S1 — K	Ignition: **OFF**	<1 Ω	Line from rotary light switch (S1) to warning lamp (A1e25) interrupted. Replace complete electronic stage of warning lamp.

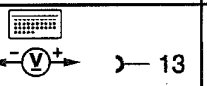
Test step 3

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check MIL (A1e24) for function	 8 — 2	Ignition: **ON**	Control light illuminates	Line from socket 8 to battery ground (W10) interrupted.
	N30/2 2 — A1e24 1	Ignition: **OFF**	< 1 Ω	Line from socket 2 on ASD control module (N30/2) to plug connector on MIL (A1e24) interrupted.
	⊥ — A1e24	Ignition: **ON**	> 11 V	Line from coupling, warning lamp (A1e25/2) to soldered connection, MIL (A1e24) interrupted. Bulb defective.

Test step 4

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Warning lamp (A1e25) and MIL (A1e24) illuminate continuously – engine running	W10  N30/2 —< 8	Ignition: **OFF**	< 1 Ω	Line from socket 8, ASD control module (N30/2) to battery ground (W10) interrupted.
	K1/2 8—<  N30/2 >— 12	Ignition: **ON**	> 11 V	Only possible on 1st version up to approx. 03/89: line from socket 12, ASD control module (N30/2) to relay, overvoltage protection (K1/2) interrupted.
	N30/2 12 >—  K1/2 —< 8	Ignition: **OFF**	< 1 Ω	
	⊥  K1/2 —▬ 8	Ignition: **ON**	> 11 V	Only required on 1st version up to approx. 03/89. Power discontinuity in relay, overvoltage protection (K1/2) replace. Fuse defective.
	⊥  K1/2 —▬ 7	Ignition: **ON**	> 11 V	2nd version from approx. 04/89 power discontinuity in relay, overvoltage protection (K1/2) – replace. Fuse defective. **Note** If power is not present at terminal 7 (K1/2), the ASD system does not function at all.

Test step 4 (continued)

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Check terminal D + alternator - voltage at terminal 61e	 8 — 13	Engine: OFF Start engine	0 V >12.5 V	Line from socket 13 on ASD control module (N30/2) to line connector (X35) 1st version and (X4/10) 2nd version terminal 61e interrupted. If the charge indicator light illuminates simultaneously, then check line, alternator and regulator. Replace ASD control module.

Test step 5

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
Warning lamp (A1e25) and MIL (A1e24) do not illuminate Ignition: **ON**	 8 — V — 14	Ignition: **ON**	>11 V	Line from socket 14 on ASD control module (N30/2) to relay, overvoltage protection (K1/2) socket 7 interrupted.
	⊥ — V — K1/2 — 1	Ignition: **ON**	>11 V	Line between battery via line connector X35 1st version and X4/10 2nd version to relay overvoltage protection (K1/2) interrupted.
	⊥ — V — K1/2 — 3	Ignition: **ON**	>11 V	Line from ignition switch via plug connector, engine harness (a) to relay, overvoltage protection (K1/2) interrupted.
	⊥ — V — K1/2 — 7	Ignition: **ON**	>11 V	Discontinuity in relay – overvoltage protection (K1/2) replace. Fuse in relay – overvoltage protection defective

Test step 5 (continued)

Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
	W10 — Ω — N30/2 —(8	Ignition: **ON**	Warning lamp illuminates	Line from socket 8 on ASD control module (N30/2) to battery ground (W10) interrupted.
	N30/2 4)— — Ω — A1e25 —(1	Ignition: **OFF**	<1 Ω	Line from socket 4, ASD control module to socket 1, warning lamp interrupted.
	W1 — Ω — A1e25 —(4	Ignition: **OFF**	<1 Ω	Line from socket 4 on warning lamp (A1e25) to ground (W1) interrupted.
	⊥ — V — A1e25 —(2	Ignition: **ON**	>11 V	Line from fuse box (fuse 7, socket 15) to warning lamp (A1e25) interrupted. Exchange electronic stage.