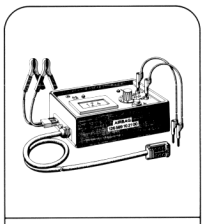
Special tools



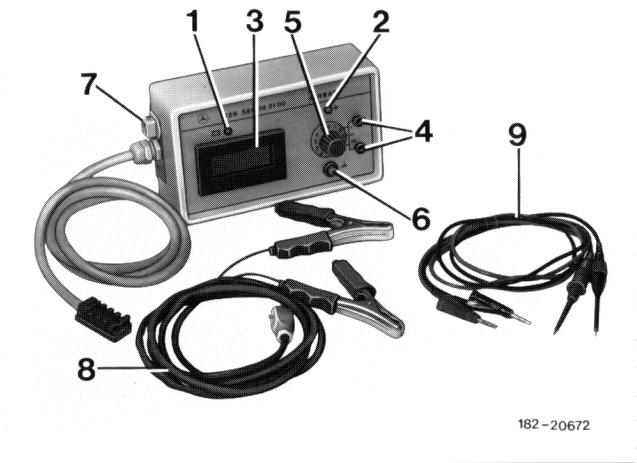
126 589 10 21 00

201 589 00 99 00

Note

The tester 126 589 10 21 00 must always be used when testing the airbag and belt tensioner restraint system. (For test instructions, see paragraphs entitled "Test instructions for tester 126 589 10 21 00").

If other testers are used, there is a danger of triggering the airbag and belt tensioner restraint system.



1 Indicator lamp for internal power supply
2 Indicator lamp for reserve power source
3 Digital display
4 Test jacks for external voltage and resistance measurements
5 Test selector switch
6 Ground button (to test the insulation resistance)
7 Connection for external power supply
8 Cable for external power supply
9 Test cable for external voltage and resistance measurements

Connecting tester

1 Turn ignition key to position "0", disconnect negative terminal of battery and cover.

2 Access test coupling/plug connection for airbag, 10-pin (X29/9):
In model 124, on passenger's side foot rest or on the plate below this.

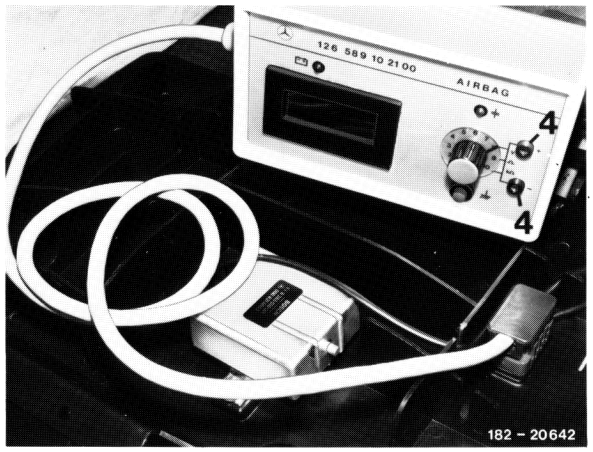
⚠

Before disconnecting the 10-pin plug connection (X29/9) to connect or disconnect the tester, always turn the ignition key to position "0" and disconnect and cover the negative terminal of the battery. It is essential to ensure that the disconnected battery terminal cannot automatically come into contact with the negative pole.

X29/9 10-pin plug connection

3 Disconnect 10-pin plug connection (X29/9) and connect tester with the 10-pin plug of the cable harness.

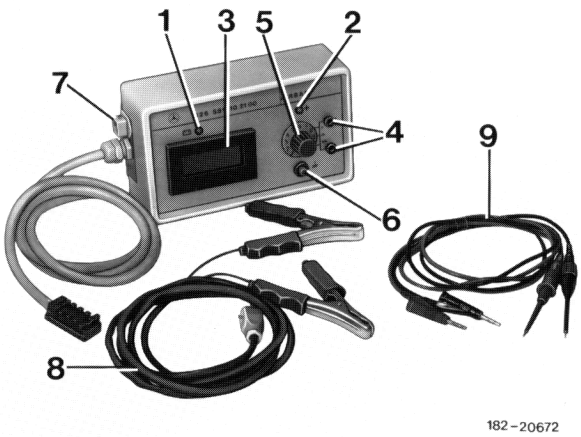
4 Reconnect battery for test.



Connecting tester for use for external voltage or resistance measurements.

1 Connect cables (8) for tester power supply to connection (7) and couple to positive and negative poles of battery.

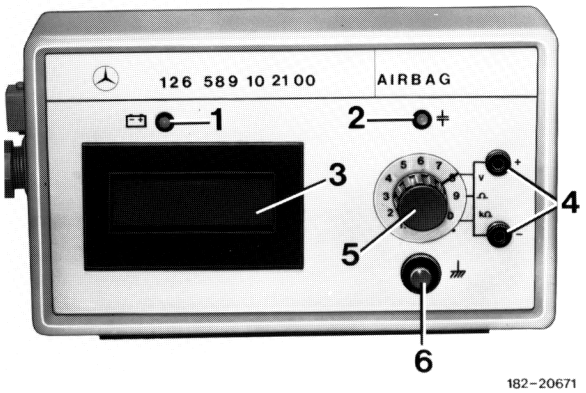
2 Plug test cables (9) into test jacks (4).



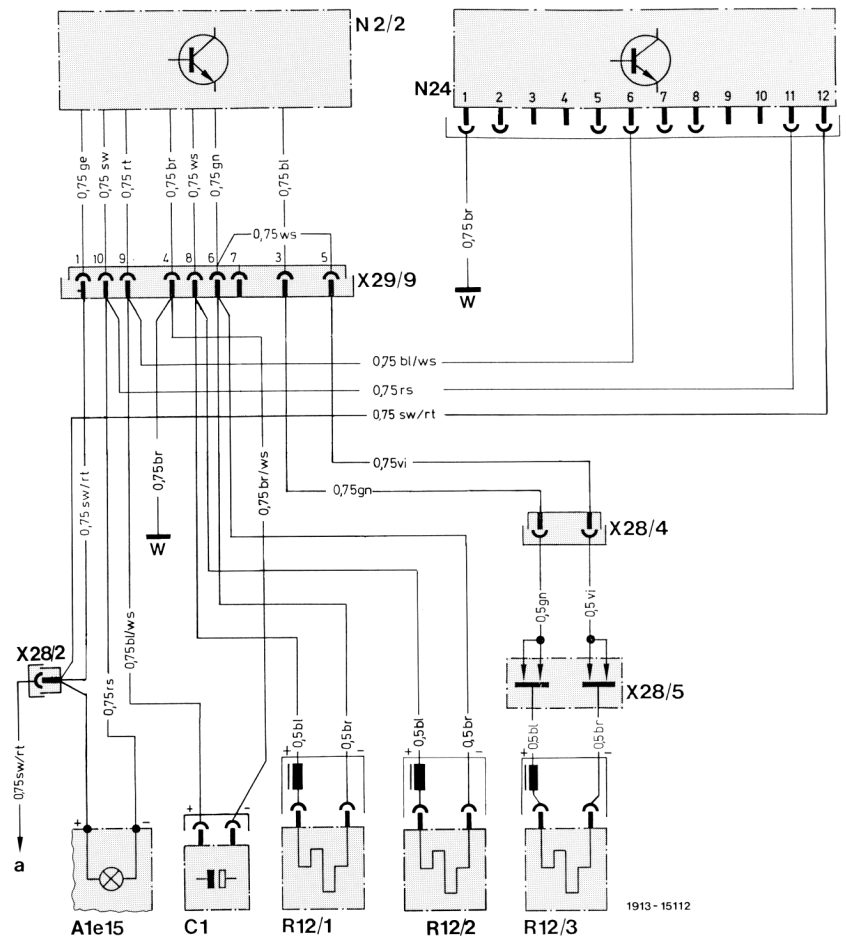
3 When measuring voltages, turn test selector switch to position "8". The display is in volts (V).

4 When measuring resistances, turn test selector switch to position (9). The display is in ohms (Ω).

Note
If the tester is used for external voltage or resistance measurements, it must be disconnected from the 10-pin plug of the airbag and belt tensioner cable harness.



182-20671

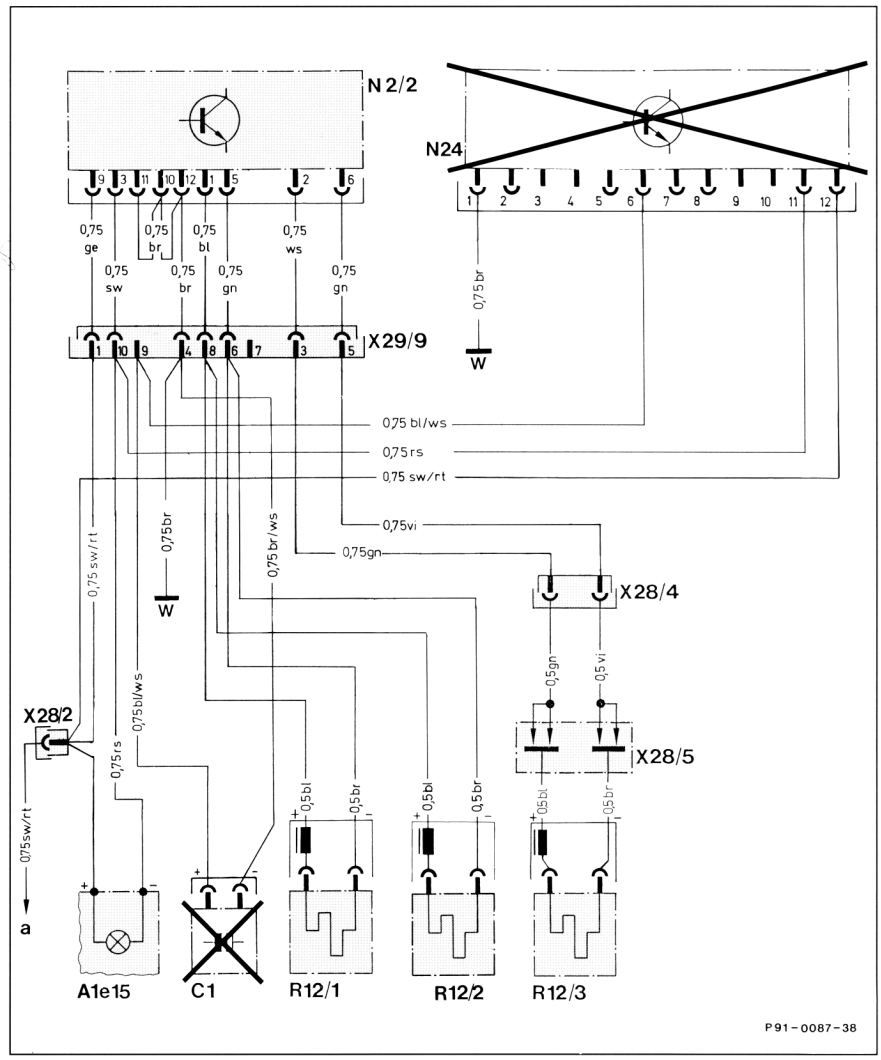


Wiring diagram for airbag and driver's and passenger's belt tensioner system with 4 carbon contacts and voltage transformer (from production launch)

A1e15	Instrument cluster, RS warning lamp, airbag
C1	Reserve power source, airbag
N2/2	Control unit, airbag with belt tensioner
N24	Voltage transformer, airbag
R12/1	Detonator, belt tensioner, front left
R12/2	Detonator, belt tensioner, front right
R12/3	Detonator, airbag
W12★	Main ground point, center console
X28/2	Plug connection, power supply, airbag with belt tensioners
X28/4	Plug connection, airbag, detonator
X28/5	Collector ring, detonator, airbag
X29/9	Test coupling/plug connection, airbag, 10-pin
a	Fuse box, terminal 15 R, fuse 18, input, via X28/2 Terminal 15 R to N2/2, N24, A1e15

★ Marked "W" in wiring diagram

The plug pins 3, 5, 6, 7 and 8 in the bottom section of the plug are short-circuited when the 10-pin plug connection (X29/9) is disconnected. When disconnecting the connectors for the belt tensioner detonators (R12/1, R12/2) and the airbag detonator (R12/3), these are short-circuited.



Wiring diagram for airbag and driver's and passenger's belt tensioner system with control unit for airbag 1/3 (recognisable by inscription "Airbag 1/3" on the test coupling/plug connection, airbag X29/9)

A1e15	Instrument cluster, warning lamp, airbag (RS, SRS)
N2/2	Control unit, airbag with belt tensioner
R12/1	Detonator, belt tensioner, left seat
R12/2	Detonator, belt tensioner, right seat
R12/3	Detonator, airbag
W12★	Main ground point, center console
X28/2	Plug connection, power supply, airbag with belt tensioners
X28/4	Plug connection, airbag/detonator
X28/5	Collector ring, detonator, airbag
X29/9	Test coupling/plug connection, airbag, 10-pin
a	Model 124, fuse box, terminal 15 R, fuse 2. Input via X28/2

★ Marked "W" in wiring diagram

Note

In vehicles with airbag 1/3, the reserve power source for airbag (C1) and the voltage transformer for airbag (N24) are removed and the cable ends insulated. The plug pins 3, 5, 6, 7 and 8 on the bottom section of the plug are short-circuited when the 10-pin plug connection (X29/9) is disconnected. When disconnecting the connectors for the belt tensioner detonators (R12/1, R12/2) and the airbag detonator (R12/3), these are short-circuited.

Test program

a) The warning lamp (A1e15) for the restraint system in the instrument cluster fails to light up when the ignition key is turned to position 1 or 2 (ignition).

Check bulb of warning lamp in instrument cluster.

Remove instrument cluster.
Check bulb.

Bulb OK.	Bulb faulty.

Renew bulb.
Turn ignition key to position "1".
Warning lamp must light up and go out again after approx. 10 s or after 4 s in vehicles with airbag 1/3.

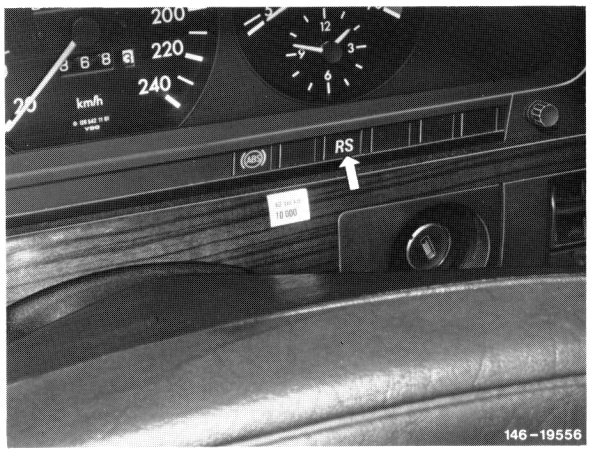
Warning lamp goes out.	Warning lamp fails to go out.

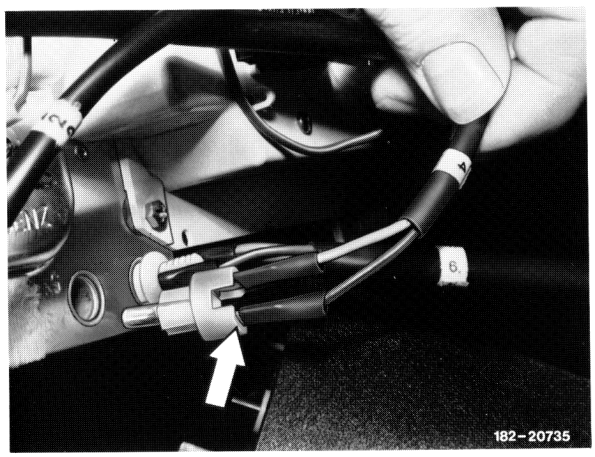
Proceed with test step 2

End of test

Check power supply for bulb.

Connect tester for measuring external power (see "Connecting tester").
Turn test selector switch to position "8".
Turn ignition key to position "1".
With the test rods on the bulb socket, check black/red cable, voltage to vehicle ground.
Reference value: battery voltage





Reference value correct	Reference value incorrect

Disconnect battery.
Turn test selector switch to position "9".
Using test rods, check black/red cable between fuse box, terminal 15 R, fuse 2, input and socket for open circuit.

Reference value: 0 – 1 Ω

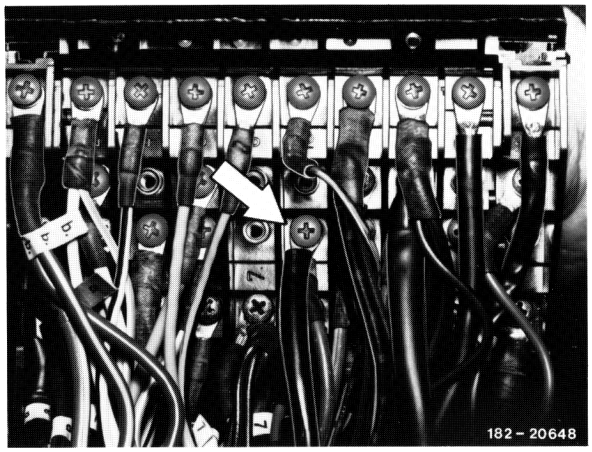
Reference value correct	Reference value incorrect

Renew cable harness.
Check airbag and belt tensioner system.

End of test

Connect tester for external measurement of power.
Turn test selector switch to position "8".
Turn ignition key to position "1".
With test rods on terminal 15 R, fuse 2, input, check voltage to vehicle ground.

Reference value: battery voltage



Reference value correct	Reference value incorrect

Check secureness of connections.
Check airbag and belt tensioner system.

End of test

Check 1-pin plug connection (X28/2) (center console)
coupling, black/red cable to vehicle ground.

Reference value: battery voltage

Reference value correct	Reference value incorrect

Renew cable.
Check airbag and belt tensioner system.

End of test

Disconnect battery.
Disconnect 10-pin plug connection (X29/9). In model 124, under passenger's foot rest or on plate beneath this.
Using test rods, check pink cable from 10-pin plug, connection no. 10, as far as socket for open circuit.

Reference value: 0 – 1 Ω

Reference value correct	Reference value incorrect

Renew cable harness.
Check airbag and belt tensioner system

End of test

Using test rods, check brown cable from 10-pin plug (X29/9), connection no. 4, to vehicle ground.

Reference value: 0 – 1 Ω

Reference value correct	Reference value incorrect

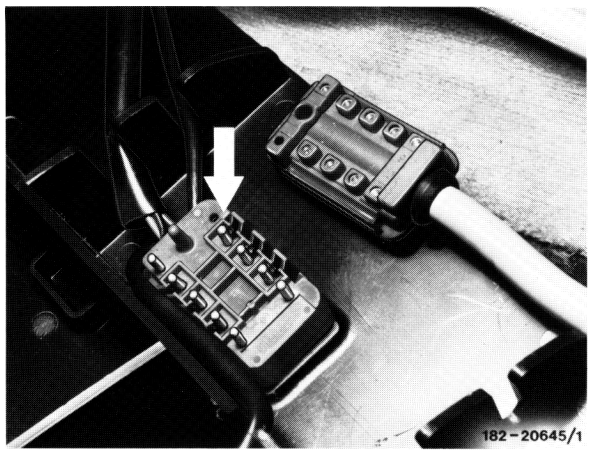
Open circuit in brown cable from 10-pin plug (X29/9), connection no. 4, to main ground point (W12) in center console.
Renew cable harness.

Check airbag and belt tensioner system.

End of test

Renew control unit.
Check airbag and belt tensioner system.

End of test



b) After turning the ignition key to position "1", the warning lamp lights up but fails to go out again within 10 s or approx. 4 s in vehicles with airbag 1/3, or flickers intermittently during driving.

Checking airbag and belt tensioner system

Test step 1 (test selector switch position 1)
Test power supply for control unit (battery OK)
Connect tester to 10-pin plug of cable harness (see "Connecting tester").
Turn ignition key to position "1".

Reference value: battery voltage

Reference value correct	Reference value incorrect

Disconnect battery.

Disconnect tester from 10-pin plug of cable harness.
Connect tester for external resistance measurement.
Turn test selector switch to position "9".

Using test rods, check black/red cable as far as 10-pin plug, connection no. 1, for open circuit.

Reference value: 0 – 1 Ω

Reference value correct	Reference value incorrect

Renew cable harness.
Check airbag and belt tensioner system.

End of test

Using test rods, check brown cable from 10-pin plug (X29/9), connection no. 4, to vehicle ground.

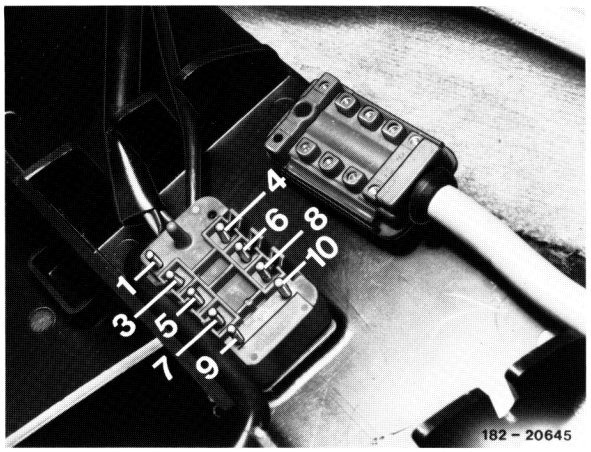
Reference value: 0 – 1 Ω

Reference value correct	Reference value incorrect

Intermittent open circuit in brown cable from 10-pin plug (X29/9), connection no. 4, to main ground point (W12) in center console.

Eliminate open circuit.
Check function of warning lamp (A1e15).

End of test



Test step 2 (test selector switch position 2) **Not required for airbag 1/3**
Test voltage transformer (N24)

Connect tester to 10-pin plug, ignition key to position "1".
Reference value: 12 ± 1 volts, minimum test duration 30 seconds.

Reference value correct	Reference value incorrect

Check charge of reserve power source (C1) (test selector switch in position "6")
The reserve power souce (C1) is charged via the tester until the maximum voltage is reached.

Reference value: ≥ 9

Reference value correct	Reference value incorrect

Check capacitance of reserve power source (test selector switch in position "7").

The reading should be taken when the indicator lamp for the reserve power source on the tester goes out (independent of the control unit)

Control unit part no.	126 820 14 10
Res. power source part no. C ≥ 4.0 mF	000 821 00 62
Res. power source part no. C ≥ 7.0 mF	000 821 02 62
Control unit part no. and control unit part no. C ≥ 7.0 mF part no.	124 820 51 10 002 820 97 10 000 821 02 62

Reference value correct	Reference value incorrect

Disconnect and bridge connection from reserve power source (C1).

Connect tester for external resistance measurement.

Using test rods, measure resistance between connections 4 and 9 on 10-pin plug.

Reference value: 0–1 Ω

Reference value correct	Reference value incorrect

Renew cable harness and check airbag and belt tensioner system.

End of test

Renew reserve power source (C1).

Check function of warning lamp (A1e15).

End of test

Turn ignition key to position "0".
Disconnect tester from 10-pin plug of cable harness.
Connect tester for external measurement of voltage.
Turn test selector switch to position "8".
Disconnect 12-pin coupling from voltage transformer (N24).
Turn ignition key to position "1".
Check power supply to voltage transformer (positive test rod to 12, negative test rod to socket 1).

Reference value: battery voltage

Reference value correct	Reference value incorrect

Turn ignition key to position "0".
Turn test selector switch to position "9".
Using both test rods, check cable from socket 6 to 10-pin plug 9 for open circuit.

Reference value: 0 – 1 Ω

Reference value correct	Reference value incorrect

Renew voltage transformer (N24).
Check function of warning lamp (A1e15).

End of test

Renew cable harness and check airbag and belt tensioner system.

End of test

Turn ignition key to position "0".
Turn test selector switch to position "9".
Using both test rods, check black/red cable from socket 12 to fuse box, terminal 15R, for open circuit.

Reference value: 0 – 1 Ω

Reference value correct	Reference value incorrect

Open circuit in brown cable from socket 1 to main ground point.
Check function of warning lamp (A1e15).

End of test

Renew cable harness and check airbag and belt tensioner system.

End of test

Test step 3
Test resistance of airbag detonator (R12/3).

To do this, turn steering wheel to full lock left and right several times.

Tester connected to 10-pin plug, ignition key in position "1".

Reference value: 2 – 6 Ω

Reference value correct	Reference value incorrect

To test insulation resistance (cable harness for short circuit to ground), press ground button (arrow).

Reference value: ≥ 20 kΩ (EEE)

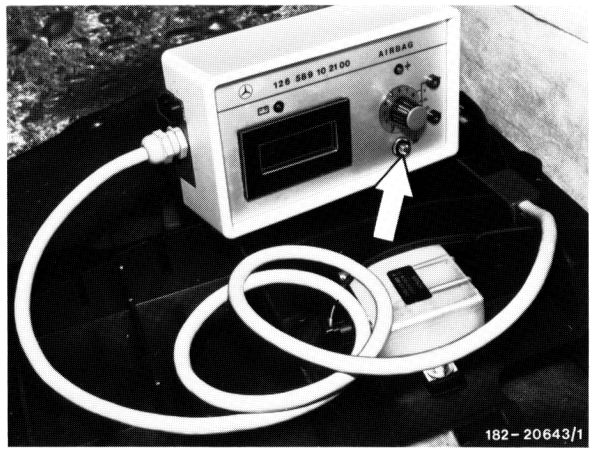
Reference value correct	Reference value incorrect

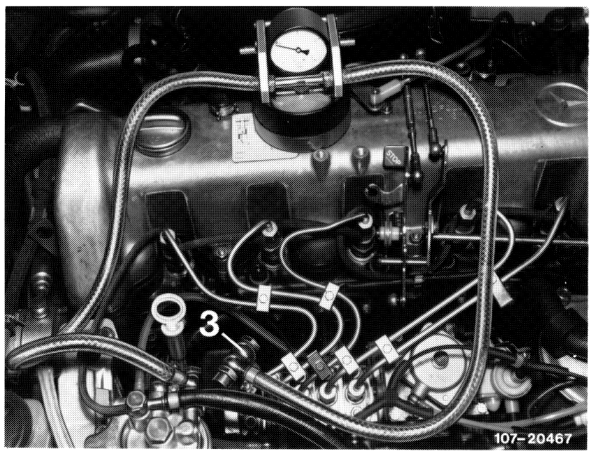
Renew cable harness and check airbag and belt tensioner sytem.

End of test

Disconnect 2-pin plug connection (X28/4) under dashboard (to do this, disconnect and reconnect the battery).
Resistance ≥ 20 kΩ EEE (∞)
If resistance is lower, renew cable harness and check airbag and belt tensioner system. If resistance ≥ 20 kΩ EEE (∞), bridge 2-pin plug then read off resistance.

Reference value: 0 – 1 Ω





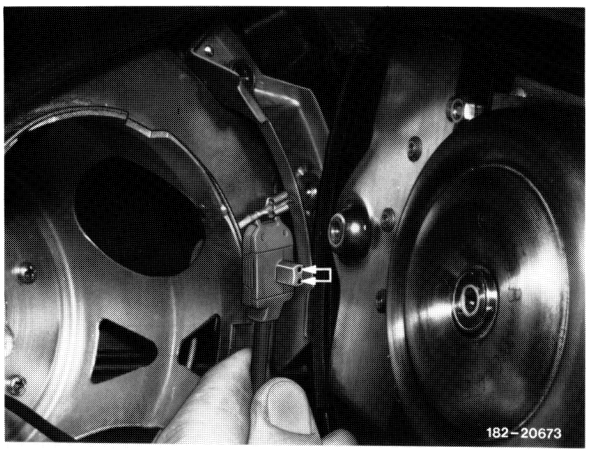
Reference value correct	Reference value incorrect

Renew cable harness and check airbag and belt tensioner system.

End of test

Remove airbag unit (to do this, disconnect battery).
Bridge connection for airbag unit.
Re-contact 2-pin coupling with 2-pin plug under dashboard (X28/4).
Measure resistance.

Reference value: 0 – 6 Ω



Reference value correct	Reference value incorrect

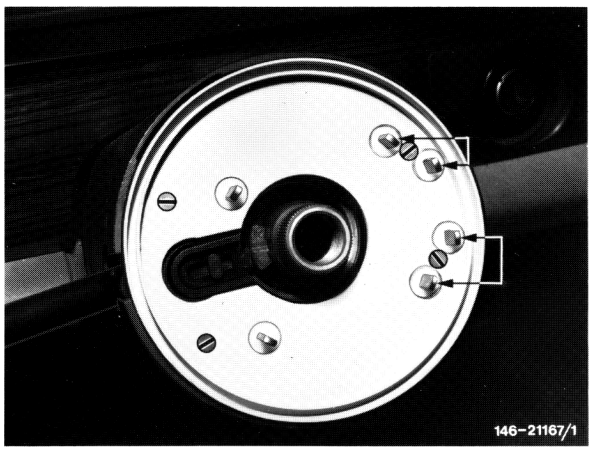
Renew airbag unit.
Check function of warning lamp (A1e15).

End of test

Remove steering wheel.
Bridge carbon contacts one after the other.
Measure resistance.

Reference value: 0 – 1 Ω

Reference value correct	Reference value incorrect



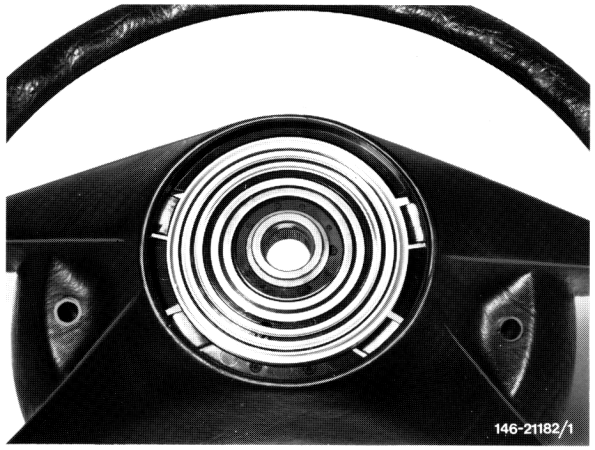
Renew collector ring

Renew carbon contacts

Note
Ensure that there is good contact between the collector ring and the carbon contacts (no grease).

Check function of warning lamp (A1e15).

End of test



Test step 4
Test resistance of belt tensioner unit

Tester connected to 10-pin plug, ignition key in position "1".

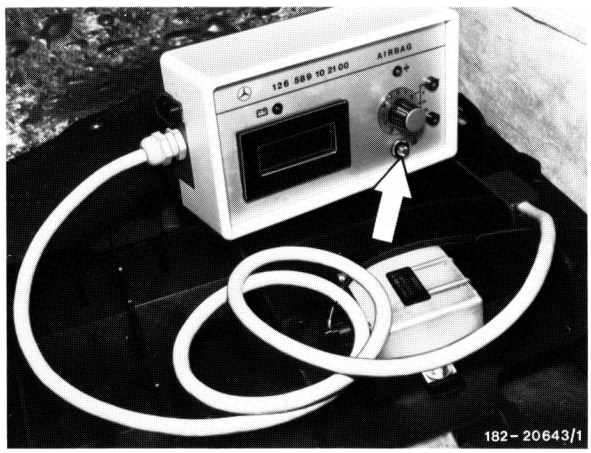
Reference value: 2 – 6 Ω (with 1 belt tensioner)
Reference value: 1 – 1.7 Ω (with 2 belt tensioners)

Reference value correct	Reference value incorrect

Check insulation resistance;
to do this, press ground button.

Reference value: ≥ 20 kΩ (EEE) ∞

Reference value correct	Reference value incorrect

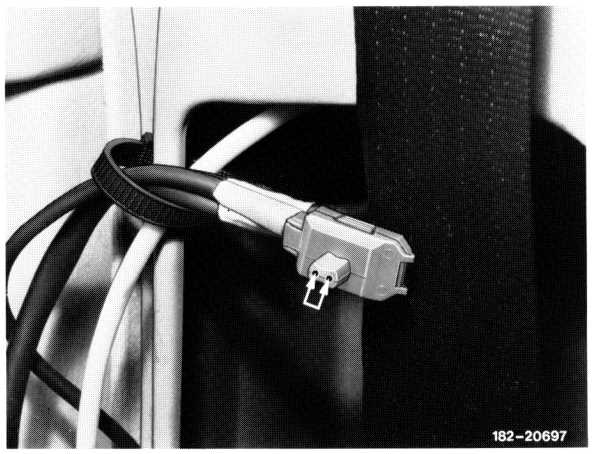


Renew cable harness and check airbag and belt tensioner system.

End of test

Remove covering for right-hand seat belt.
Disconnect connector for belt tensioner unit.
Resistance ≥ 20 kΩ EEE(∞).
If resistance is lower, renew cable harness and check airbag and belt tensioner sytem.
If resistance ≥ 20 kΩ EEE (∞), bridge connection.
Measure resistance.

Reference value: 0 – 1 Ω



Reference value correct	Reference value incorrect

Renew belt tensioner unit

Renew cable harness

Check airbag and belt tensioner system.

End of test

Test step 5 is not required.

Test step 6
Test charge of reserve power source (C1).
Not required for airbag 1/3

The reserve power source (C1, capacitor) is charged via the tester until the maximum voltage is reached.

Reference value: ≥ 9

Reference value correct	Reference value incorrect

Disconnect connection from reserve power source (C1).
Bridge connection.
Connect tester for external resistance measurement.
Using test rods, measure resistance between connections 4 and 9 on 10-pin plug.

Reference value: 0 – 1 Ω

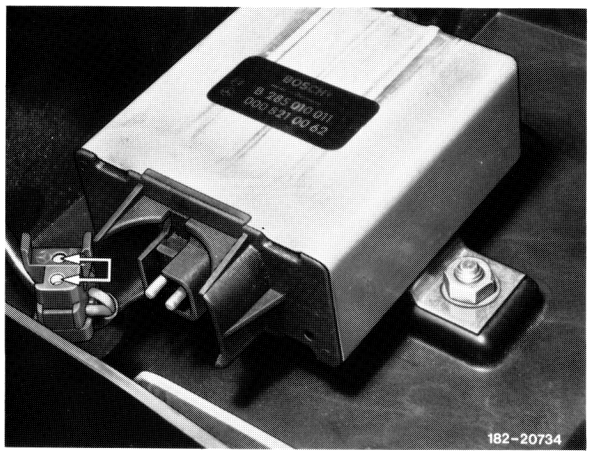
Reference value correct	Reference value incorrect

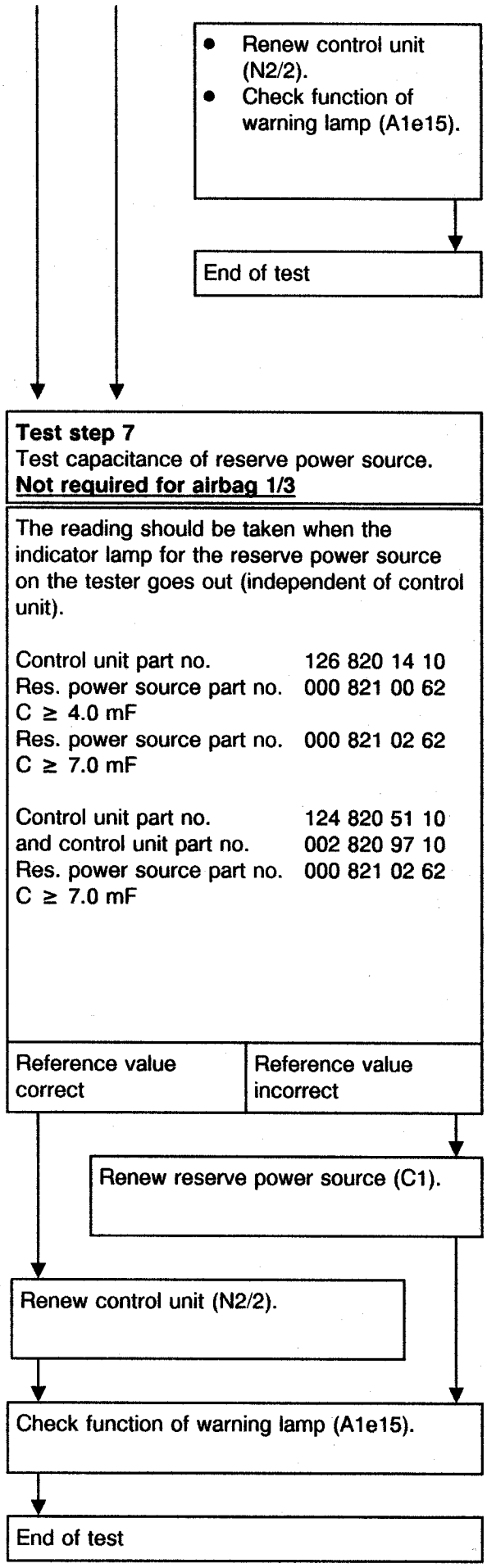
Renew cable harness and check airbag and belt tensioner system.

End of test

Renew reserve power source (C1) and repeat test step 6.

Reference value correct	Reference value incorrect




• Renew control unit (N2/2).
• Check function of warning lamp (A1e15).
End of test
Test step 7
Test capacitance of reserve power source.
Not required for airbag 1/3
The reading should be taken when the indicator lamp for the reserve power source on the tester goes out (independent of control unit).
Control unit part no. 126 820 14 10
Res. power source part no. 000 821 00 62
C ≥ 4.0 mF
Res. power source part no. 000 821 02 62
C ≥ 7.0 mF
Control unit part no. 124 820 51 10
and control unit part no. 002 820 97 10
Res. power source part no. 000 821 02 62
C ≥ 7.0 mF
Reference value correct
Reference value incorrect
Renew reserve power source (C1).
Renew control unit (N2/2).
Check function of warning lamp (A1e15).
End of test

Test instructions for tester 126 589 10 21 00
(revised)

Before testing with the tester, the airbag restraint system must be tested by means of the RS/SRS warning lamp (A1e15). With the ignition switched on, the RS/SRS warning lamp should light up for approx. 10 s, or approx. 4 s in vehicles with airbag 1/3. If necessary, check warning lamp or cable.

⚠

Each time before disconnecting the red test coupling/plug connection for airbag, 10-pin (X29/9), to connect the tester, the ignition key must be turned to position "0", the negative terminal of the battery disconnected and covered. Then reconnect the battery for the test.

Test step	Scope of test	Operation	Reference value	Possible causes if reference value not attained
1	Power supply	Ignition: OFF Disconnect 10-pin coupling (X29/9) and connect cable harness plug connector with tester. Ignition: ON	LED: ⊟+ ON Battery voltage	Battery charge not OK Cable harness faulty
2[1)]	Voltage transformer N24 (not installed in all vehicles)	Ignition: ON	LED: ⊟+ ON U = 12 ± 1 V after 30 s	Voltage transformer faulty Reserve power source faulty Cable harness faulty
3	Resistance of airbag unit (R12/3) Collector ring	Ignition: ON Turn steering wheel to full lock (left and right)	LED: ⊟+ ON R = 2 – 6 Ω	Contact between collector ring and carbon contact faulty Cable faulty Driver airbag unit faulty
	Insulation resistance	Ignition: ON Press ⊥ button	LED: ⊟+ ON R ≥ 20 kΩ–EEE (EEE = ∞)	Cable harness faulty Airbag unit faulty

[1)] Not required for airbag 1/3

4	Resistance of belt tensioner, passenger's belt tensioner detonator (R12/2) Detonators for driver's and passenger's belt tensioners (R12/1 and R12/2)	Ignition: ON	LED: ON R = 2 – 6 Ω (Parallel circuit) R = 1 – 1.7 Ω	Cable faulty Belt tensioner unit faulty Cable faulty Belt tensioner unit faulty
	Insulation resistance	Ignition: ON Press ⊥ button	LED: ON R ≥ 20 kΩ–EEE (EEE = ∞)	Cable harness faulty Airbag unit faulty
5	Not required			
6[1)]	Check charge of reserve power source (C1)	Ignition: ON	LED: ON ON Ref. value > 9	Cable faulty Reserve power source faulty
7[1)]	Check capacitance of reserve power source (C1)	Ignition: ON	LED ON ON goes out, then take reading C ≥ 4.0 mF C ≥ 7.0 mF	Reserve power source faulty
	Observe assignment	Control unit part number	Capacitance of reserve power source	Reserve power source part number
		126 820 14 10 002 820 97 10 124 820 51 10	4.0 mF 7.0 mF 7.0 mF 7.0 mF	000 821 00 62 000 821 02 62 000 821 02 62 000 821 02 62

Further applications using the tester as a voltmeter or ohmmeter (in the context of the airbag test only)

8 Volt-meter (volts)	Voltage measurements	External power supply cable to 12 V battery	LED: ON U = 0 – 99.9 V	
9 Ohm-meter Ω	Resistance measurements		LED: ON R = 0 – 99.9 Ω	
10 Ohm-meter (kΩ)	Not possible with tester 126 589 10 21 00, if necessary, use only approved digital multimeter (e.g.: Sun, DMM 5), Avometer			

[1)] Not required for airbag 1/3