

## 3.2 Pneumatic System Equipment (PSE)

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#### **Pneumatic Test Program**

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### Diagnosis – Function Test (PSE)

Preliminary work:

Diagnosis - Function Test ..... 11 PSE/CL

#### Component Locations

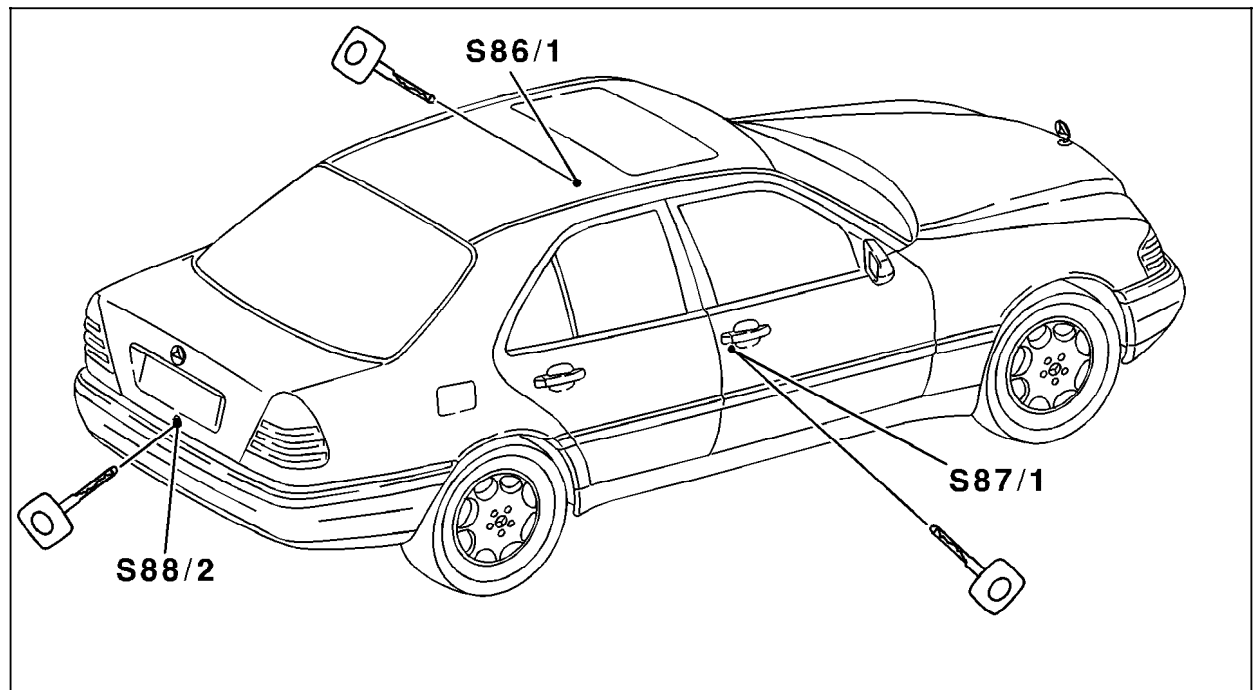


Figure 1

- S86/1 Left front door lock switch
- S87/1 Right front door lock switch
- S88/2 Trunk lid lock switch

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#### Diagnosis – Function Test (PSE)

#### Component Locations

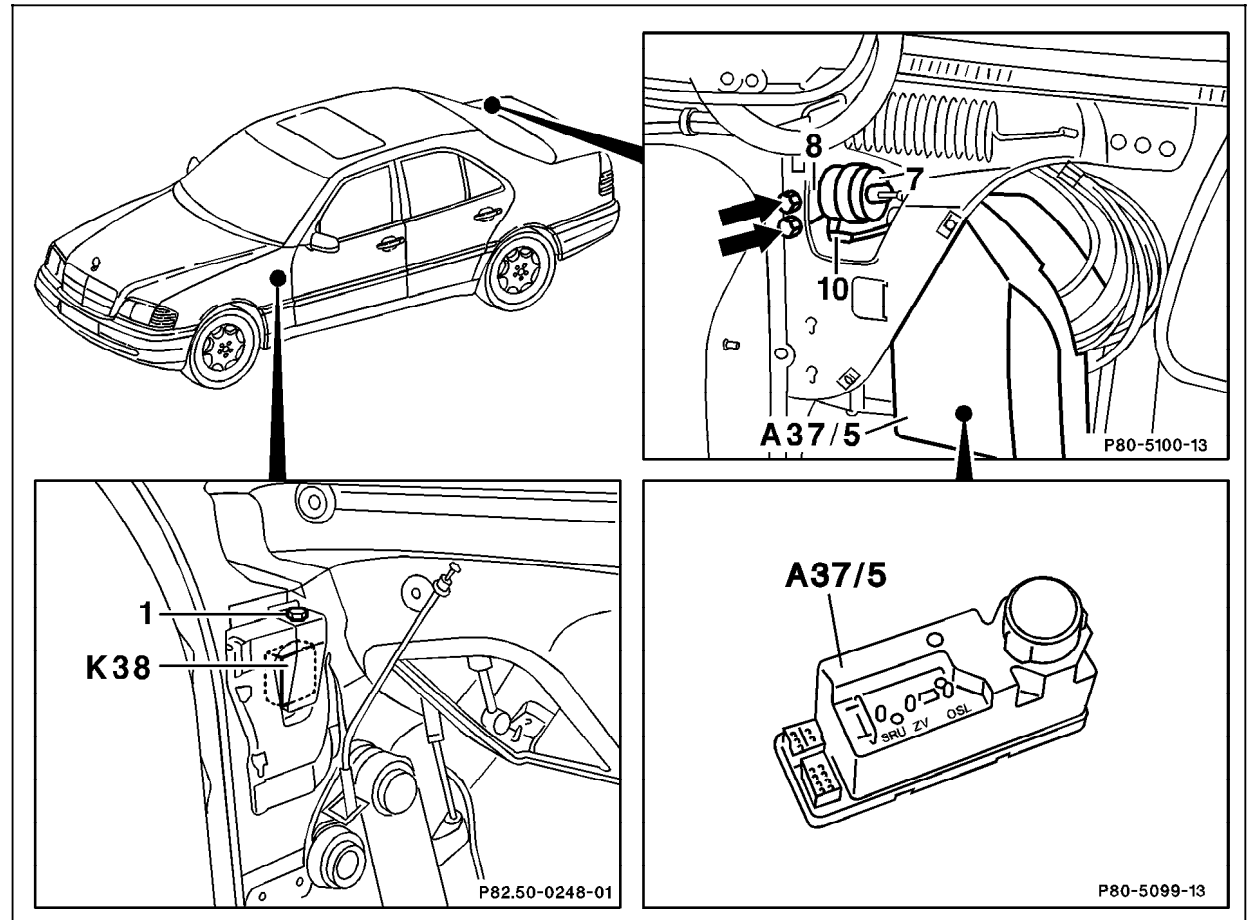


Figure 2

- A37/5 PSE control module  
(CL, MVA, OSB)
- K38 Starter lock-out relay module  
(vehicles as of 01/94 only)

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### Diagnosis – Function Test (PSE)

#### Preparation for Function Test

1. **Model 202 up to 11/94:** Check fuses F3–33 and F3–35 ok,
2. **Model 202 as of 12/94:** Check fuses F1–24 and F1–27 ok,
3. Battery voltage 11 – 14 V.
4. Vehicle unlocked.
5. All doors and trunk lid closed.
6. Left front door window open.

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy <sup>1)</sup>
⇒ 1.0 Activate immobilization (vehicles as of production start up and up to MY 1996 only)	Lock vehicle from one of the three locks. Try to start engine.	Starter motor does not turn. Engine does not start.	23 ⇒ 9.0, Wiring, Starter lock-out relay module (K38).
⇒ 2.0 Deactivate immobilization (vehicles as of production start up and up to MY 1996 only)	Unlock vehicle from one of the three locks. Try to start engine.	Starter motor turns. Engine starts.	23 ⇒ 9.0, Wiring, Circuit 15, Circuit 50, Starter lock-out relay module (K38), Ignition/starter switch (S2/1), Starter (M1).

1) Observe Preparation for Test, see 22.

#### Electrical Test Program – Component Locations (PSE)

**Note:**

There are 2 versions of the PSE control module (A37/4, A37/5), which are supplied based on the options supplied with the vehicle. The 2 versions have distinctively colored housing bases:

PSE Control Module	Housing base color
A37/4 (CL, MVA)	Grey
A37/5 (CL, MVA, OSB)	Ivory

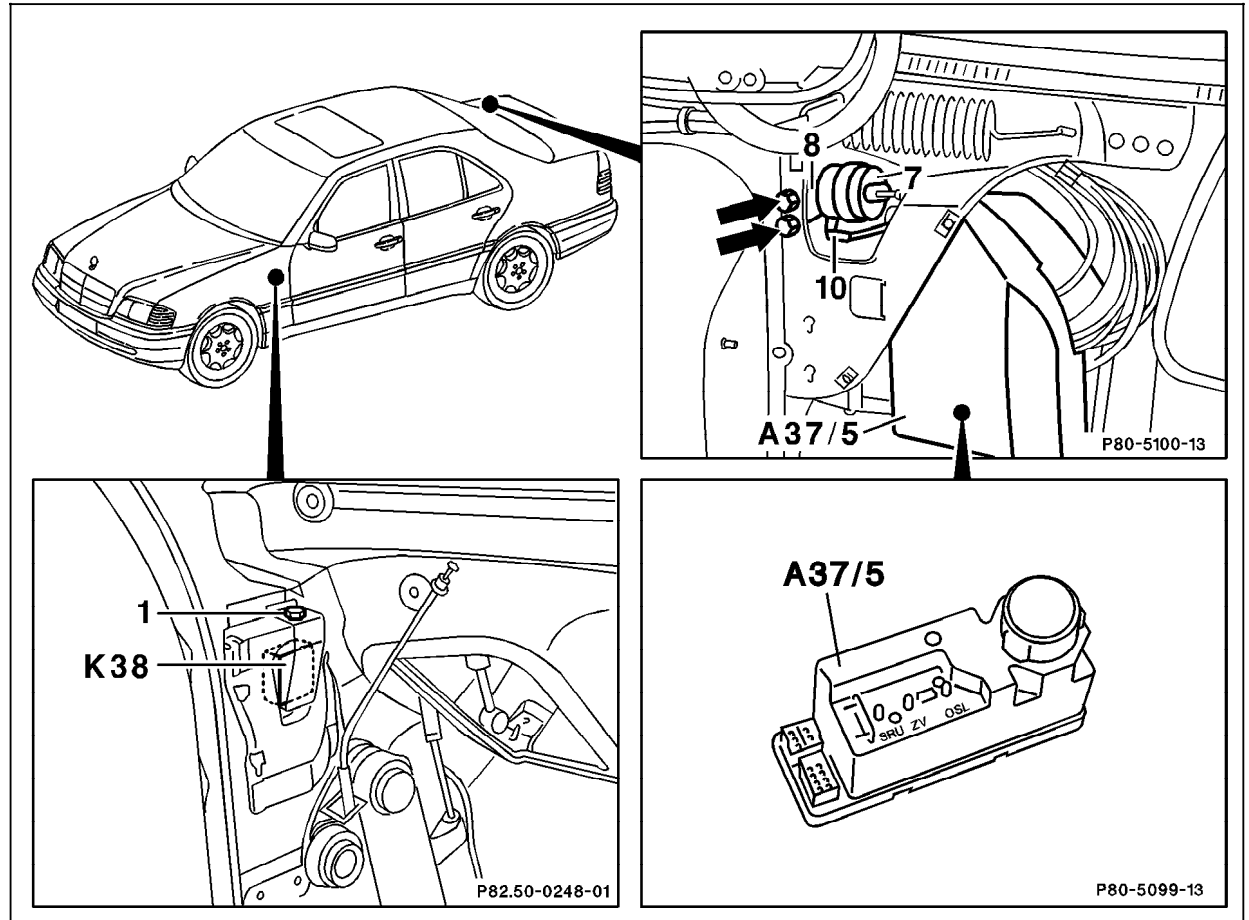


Figure 1

- A37/5 PSE control module (CL, OSB, MVA)
- K38 Starter lock-out relay module (vehicles as of production start up and up to MY 1996)

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### Electrical Test Program – Preparation for Test

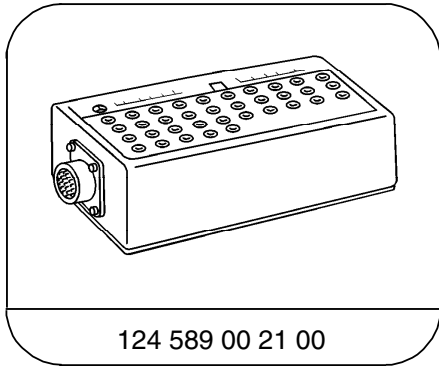
#### Preparation for Test:

1. **Model 202 up to 11/94:** Check fuses F3–33 and F3–35 ok,
2. **Model 202 as of 12/94:** Check fuses F1–24 and F1–27 ok,
3. Battery voltage 11 – 14 V.
4. Provide access to PSE control module (A37/4, A37/5).
5. Connect socket box with test cable according to connection diagram, see 22, Figure 1.

#### Electrical Wiring Diagrams

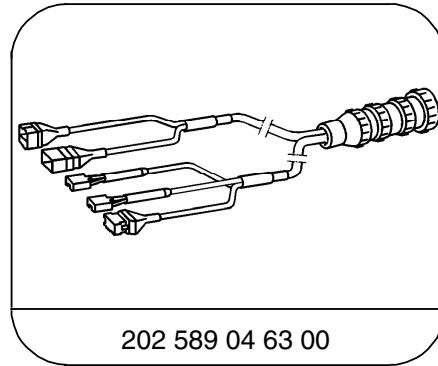
See Electric Troubleshooting Manual, Model 202, Volume 2, group 80

#### Special Tools



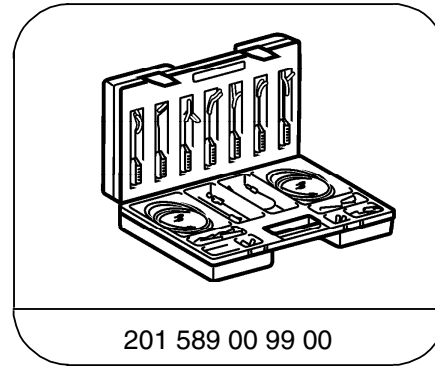
124 589 00 21 00

35-pin socket box



202 589 04 63 00

14-pin test cable



201 589 00 99 00

Electrical connecting set

#### Conventional tools, test equipment

Description	Brand, model, etc.
Multimeter <sup>1)</sup>	Fluke models 23, 83, 85, 87

<sup>1)</sup> Available through the MBUSA Standard Equipment Program.

#### Electrical Test Program – Preparation for Test

#### Electrical Components in Passenger Compartment

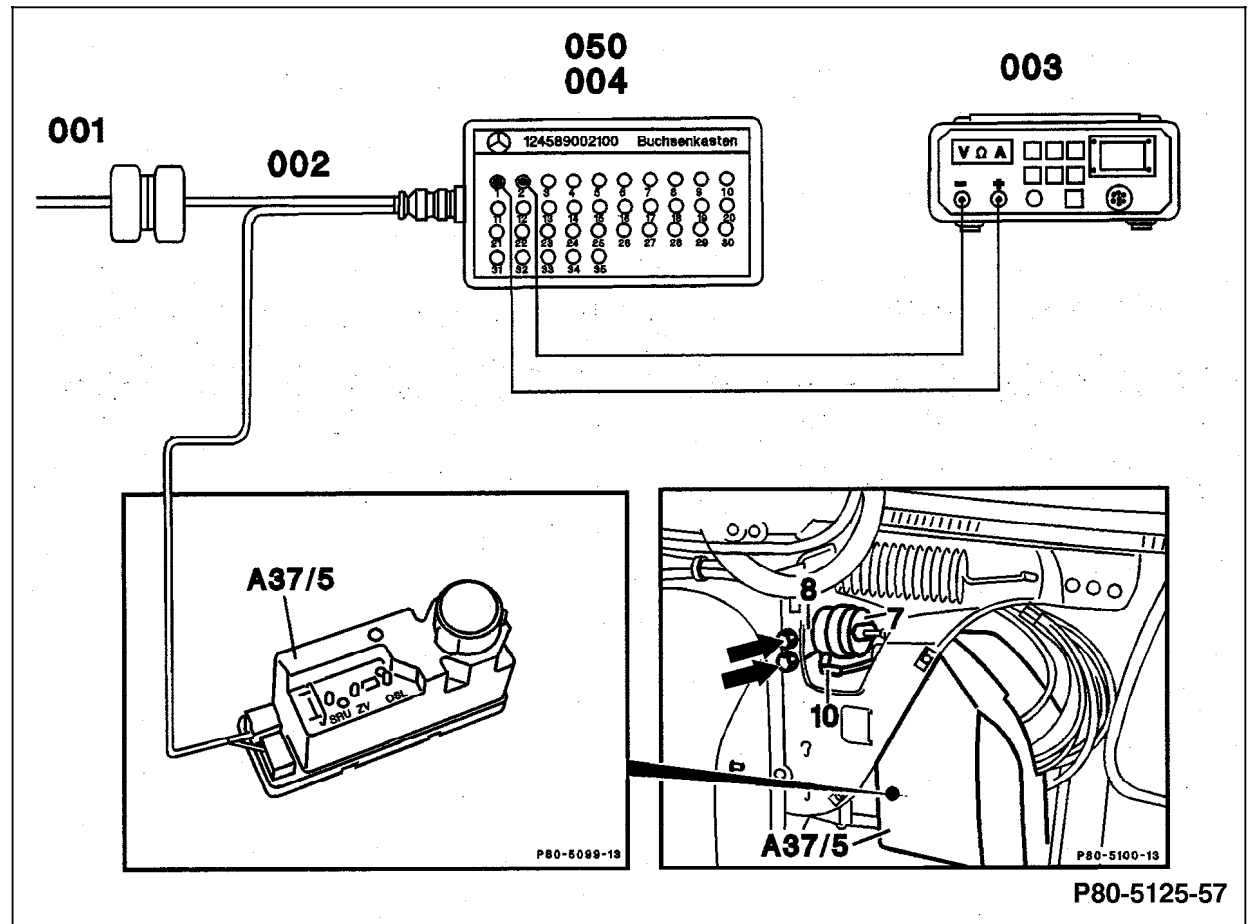


Figure 1

- 001 PSE control module connector
- 002 Test cable
- 003 Multimeter
- 004/050 Socket box (35-pole)
- A37/5 PSE control module (CL, OSB, MVA)

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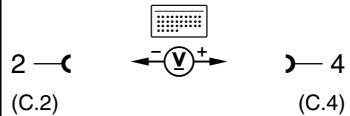
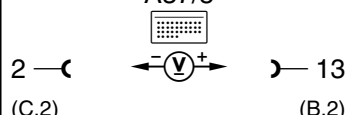
#### Electrical Test Program – Test (PSE)

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>PSE control module (A37/4, A37/5)</b> Voltage supply Circuit 30			11 – 14 V	Wiring, Circuit 31, ⇒ 1.1
1.1	Circuit 30			11 – 14 V	Wiring, Circuit 30
2.0	<b>PSE control module (A37/4, A37/5)</b> Voltage supply Circuit 15		Ignition: <b>ON</b>	11 – 14 V	Wiring, Circuit 31, ⇒ 2.1
			Ignition: <b>OFF</b>	<1 V	
2.1	Circuit 15		Ignition: <b>ON</b>	11 – 14 V	Wiring, Circuit 15
			Ignition: <b>OFF</b>	<1 V	

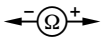
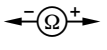
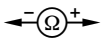
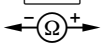


## 3.2 Pneumatic System Equipment (PSE)

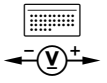
## Model 202

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.0	<b>Interior dome lamp switching circuit</b>	<p>A37/4, A37/5</p>  <p>2 —(C.2)      —(C.4) 4</p>	<p>Lock the vehicle.</p> <p>Unlock the vehicle.</p>	<p>&lt;1 V</p> <p>11 – 14 V</p>	<p>Wiring, 23 PSE/CL ⇒ 3.0–5.0</p>
4.0	<b>“REST ” FUNCTION switching circuit</b>	<p>A37/4, A37/5</p>  <p>2 —(C.2)      —(B.2) 13</p>	<p>Ignition: <b>OFF</b> Engine coolant temperature &gt;50° C.</p> <p>Ignition: <b>OFF</b> Disconnect transparent pneumatic hose at distributor plug of <b>PSE</b>. Press <b>REST</b> pushbutton.</p>	<p>&lt;1 V</p> <p>11 – 14 V PSE engages.</p>	<p>Wiring, Engine coolant temperature sensor (B10/8), A/C pushbutton control module (N22), PSE control module (A37/4, A37/5).</p>

#### Electrical Test Program – Test (PSE)

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.0 Model 202 without RTR only	<b>PSE control module (A37/4, A37/5)</b> <b>Lock switch circuit 1</b> Internal connection	<p>A37/4, A37/5</p>  <p>1 — (C.1)      11 — (A.3)</p>	Pull out fuse F3-33.	<1 Ω	A37/4, A37/5
6.0 Model 202 without RTR only	<b>PSE control module (A37/4, A37/5)</b> <b>Lock switch circuit 2</b> Internal connection	<p>A37/4, A37/5</p>  <p>3 — (C.3)      10 — (A.2)</p>	Pull out fuse F3-33.	<1 Ω	A37/4, A37/5
7.0 Model 202 without RTR only	<b>PSE control module (A37/4, A37/5)</b> <b>Front door switch</b> Internal connection	<p>A37/4, A37/5</p>  <p>5 — (C.5)      9 — (A.1)</p>	Pull out fuse F3-33. Front doors closed.	<1 Ω	A37/4, A37/5
8.0 Model 202 up to 11/93 only	<b>PSE control module (A37/4, A37/5)</b> <b>Circuit 30</b> Internal connection	<p>A37/4, A37/5</p>  <p>7 — (C.7)      8 — (C.8)</p>	Pull out fuse F3-33.	<1 Ω	A37/4, A37/5

#### Electrical Test Program – Test (PSE)

<p>9.0 Model 202 with DAS stage 1 only</p>	<p><b>PSE control module (A37/4, A37/5)</b> Immobilization output</p>	<p>A37/4, A37/5</p>  <p>7 — (-) (C.7)      — (+) (C.8) 8</p>	<p>Unlock vehicle at one of three locking points. Open left front door window. Lock vehicle at one of three locking points. Ignition: <b>ON</b></p>	<p>11 – 14 V  11 – 14 V  &lt;1 V</p>	<p>Wiring, 23 PSE/CL ⇒ 3.0 – 5.0 A37/4, A37/5.</p>
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Electrical Test Program – Test (PSE)

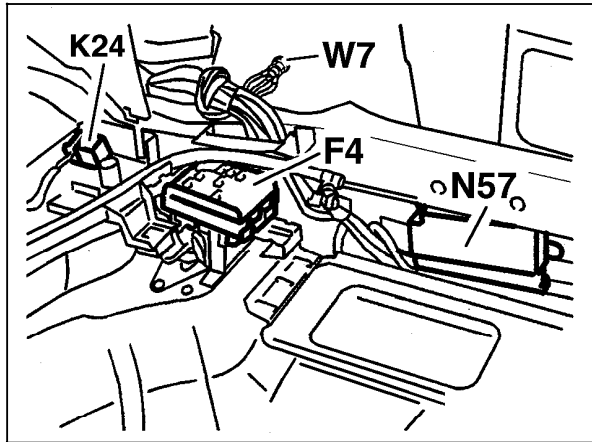


Figure 1  
W7 Ground (right wheelhousing in trunk)

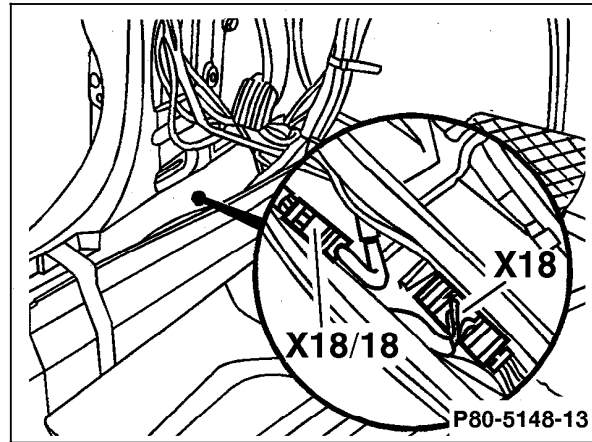


Figure 2  
X18 Interior/taillamp harness connector

Pneumatic Test Program – Component Locations

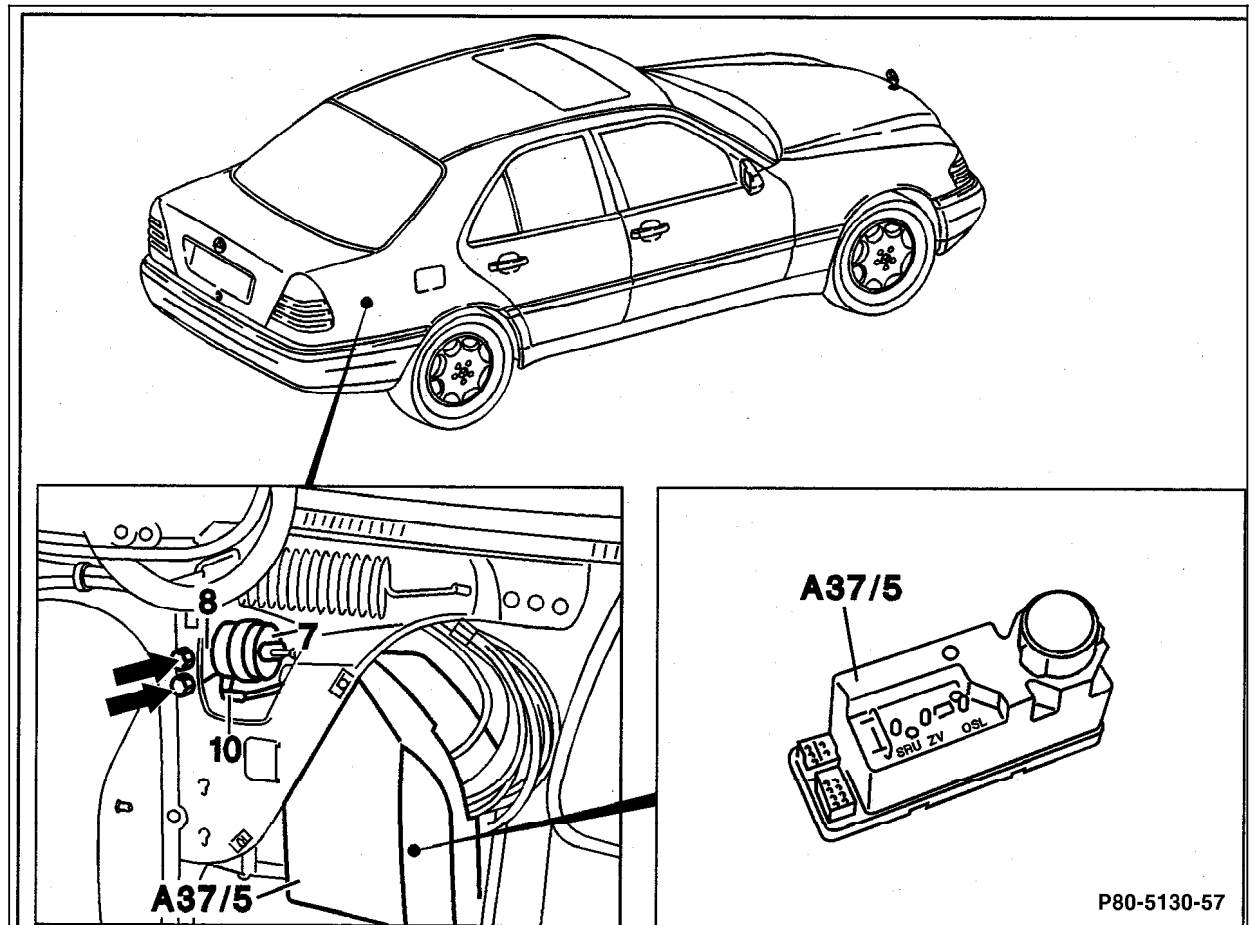


Figure 1  
A37/5 PSE control module

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P80-5130-57

### Pneumatic Test Program – PSE Control Module Test

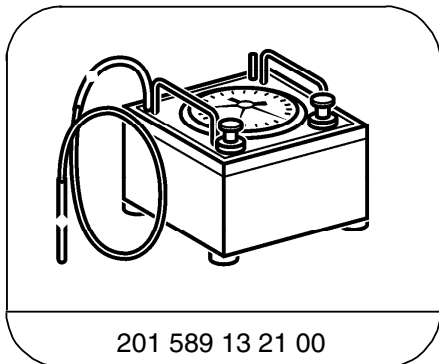
#### Preparation for Test:

1. **Model 202 up to 11/94:** Check fuses F3–33 and F3–35 ok,
2. **Model 202 as of 12/94:** Check fuses F1–24 and F1–27 ok,
3. Battery voltage 11 – 14 V.
4. Connect reservoir with vacuum Y-distributor to vacuum/pressure tester.
5. Provide access to PSE control module (A37/4, A37/5) and disconnect PSE pneumatic multiple connector (do not disconnect wiring harness).
6. Connect vacuum/pressure tester with reservoir to PSE control module (see 32, Figure 1).

#### Parts Required for Test:

1	Reservoir	107 800 08 19
1	Y-distributor	017 078 01 45
5	Plug	000 987 29 45

#### Special Tools



Tester

#### Notes:

1. Before testing the safety switch time of the consumers, as well as between the tests for **OSB** (pressure) and **MVA** (vacuum), interrupt the PSE control module power supply for at least 3 seconds.
2. After completing the **PSE** control module test, do not operate any system which would require vacuum or pressure for approx. 10 minutes.
3. The connections on the PSE control module are marked with their German acronyms. Reference to these connections in this test are made to their U. S. equivalents. In other words:  
 ZV (German) = CL (U.S.),  
 SRU (German) = MVA (U.S.),  
 OSL (German) = OSB (U.S.).

Pneumatic Test Program - PSE Control Module Test

Connection diagram - Vacuum/Pressure Tester with Reservoir

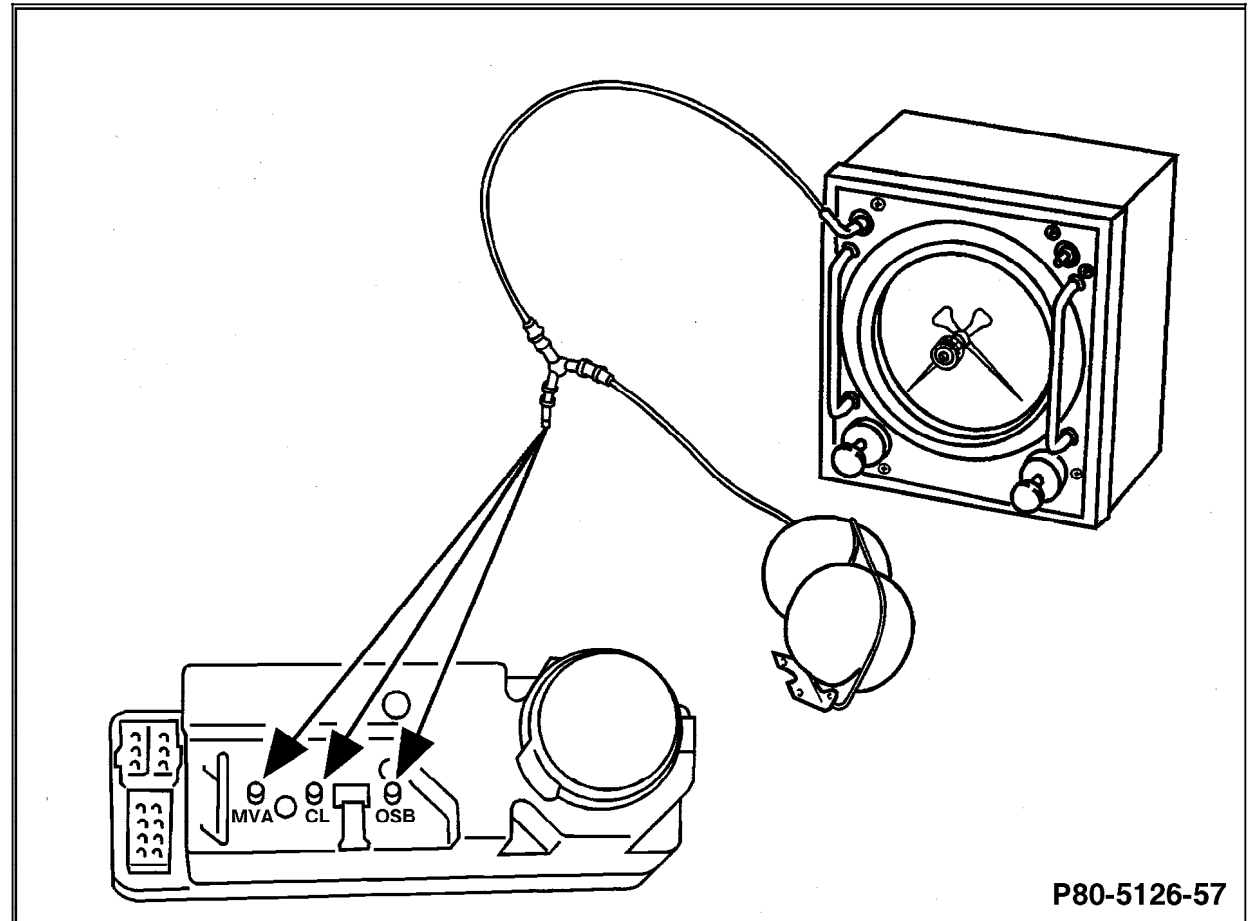


Figure 1

P80-5126-57

#### Pneumatic Test Program – PSE Control Module Test

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0	<b>Central locking system</b> Vacuum supply	PSE control module connector <b>CL</b> to <b>black</b> connector on tester.	Cap connections <b>MVA, OSB</b> , on the <b>PSE</b> control module. Lock central locking system.	450 mbar in 1.2 sec.	23 PSE/CL ⇒ 2.0 – 5.0, PSE control module (A37/4, A37/5).
⇒ 2.0	<b>Central locking system</b> Pressure supply	PSE control module connector <b>CL</b> to <b>yellow</b> connector on tester.	Cap connections <b>MVA, OSB</b> , on the <b>PSE</b> control module. Unlock central locking system.	450 mbar in 0.8 sec.	23 PSE/CL ⇒ 2.0 – 5.0 , A37/4, A37/5
⇒ 3.0 <b>Only with OSB</b>	<b>Orthopedic seat backrest (multi-contour backrest)</b> Pressure supply	PSE control module connector <b>OSB</b> to <b>yellow</b> connector on tester.	Ignition: <b>OFF</b> Cap connections <b>CL, MVA</b> , on the <b>PSE</b> control module. Ignition: <b>ON</b>	Pump runs after approx. 4 sec. delay. 450 mbar in 0.8 sec.	A37/5
⇒ 4.0	<b>Intake manifold vacuum assist</b> Vacuum supply	PSE control module connector <b>MVA</b> to <b>black</b> connector on tester.	Ignition: <b>OFF</b> Cap connections <b>CL, OSB</b> , on the <b>PSE</b> control module. Ignition: <b>ON</b>	Pump runs after approx. 8 sec. delay. 450 mbar in 1.2 sec.	A37/4, A37/5



#### Pneumatic Test Program – PSE Control Module Test

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 5.0	<b>“Rest“ function control</b> Vacuum supply	PSE control module connector <b>MVA</b> to <b>black</b> connector on tester.	Ignition: <b>OFF</b> Engine coolant temperature >50° C. Disconnect transparent pneumatic hose at distributor plug of <b>PSE</b> control module. Push <b>REST</b> pushbutton.	Pump runs, 450 mbar in 1.2 sec.	23 ⇒ 4.0, PSE control module (A37/4, A37/5).
⇒ 6.0	<b>Central locking system</b> Safety switch time	-	Cap connections <b>MVA, OSB</b> , on the <b>PSE</b> control module. Using 7mm wrench pry off yellow connector at <b>CL</b> distributor connection. Lock or unlock central locking system.	PSE control module runs, 10± 1 sec.	23 PSE/CL ⇒ 2.0 – 5.0, A37/4, A37/5
⇒ 7.0	<b>Additional consumer MVA</b> Safety switch time	-	Ignition: <b>OFF</b> Cap connections <b>CL, OSB</b> , on the <b>PSE</b> control module. Using 7mm wrench pry off transparent pneumatic hose at <b>MVA</b> distributor. Ignition: <b>ON</b>	PSE control module runs, 60 sec.	A37/4, A37/5

#### Pneumatic Test Program – PSE Control Module Test

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 8.0 <b>Only with OSB</b>	<b>Additional consumer OSB</b> Safety switch time	-	Ignition: <b>OFF</b> Cap connections <b>CL, MVA</b> , on the <b>PSE</b> control module. Using 7mm wrench pry off grey pneumatic hose at <b>OSB</b> distributor. Ignition: <b>ON</b>	PSE control module runs, 60 sec.	PSE control module (A37/5).

### Pneumatic Test Program – Pneumatic Multiple Connector Test (PSE)

**Note:**

The multiple connector was eliminated as of approx. 12/93

**Preparation for Test:**

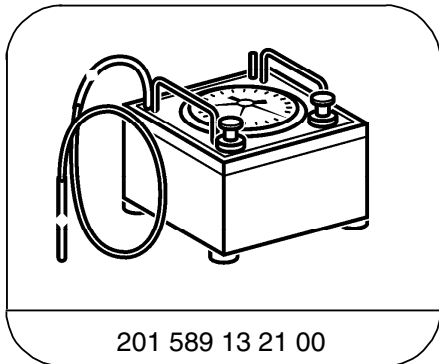
1. Pry off all pneumatic lines from pneumatic multiple connector (using a 7 mm open end wrench.)
2. Plug all connections on the upper side of the pneumatic multiple connector with plugs (part no. 124 805 02 44).
3. Connect vacuum/pressure tester to the bottom side of the pneumatic multiple connector to test the individual connections **ZV**, **SRU**, **OSL**.

**Parts Required for Test:**

10	Plugs	124 805 02 44
1	Connector	129 805 04 44

**Notes:**

The connections on the PSE control module and pneumatic multiple connector are marked with their German acronyms. In other words:  
**ZV** (German) = **CL** (English),  
**SRU** (German) = **MVA** (English),  
**OSL** (German) = **OSB** (English).

**Special Tools**

Tester

#### Pneumatic Test Program – Pneumatic Multiple Connector Test (PSE)

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>Pressure leakage</b>	<b>Yellow</b> connector on tester to connections <b>ZV, OSL</b> , on the bottom of the connector.	Apply 600 mbar pressure to multiple connector.	Pressure drop of 5 mbar in 1 minute.	Pneumatic multiple connector.
2.0	<b>Vacuum leakage</b>	<b>Black</b> connector on tester to connections <b>ZV, SRU</b> , on the bottom of the connector.	Apply 300 mbar vacuum to multiple connector.	Vacuum loss of 5 mbar in 1 minute.	Pneumatic multiple connector.