

## 18.1 Model 124.066

### Diagnosis

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### Electrical Test Program

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## Diagnosis – Function Test

| Test step/Test scope                           | Test condition  | Nominal value            | Possible cause/Remedy <sup>1)</sup> |                          |
|--|---|--------------------------|-------------------------------------|--------------------------|
|  |   |                          | Left SBE                            | Right SBE                |
| ⇒ 1.0 Seat belt extender (SBE) system          | Open and close the doors.<br>Ignition: <b>ON</b>              | Both seat belts extend.  | 23 ⇒ 1.0, 2.0, 4.0, 6.0             | 23 ⇒ 1.0, 3.0, 5.0, 10.0 |
|  | Wait approx. 30 seconds.                                      | Both seat belts retract. | 23 ⇒ 8.0                            | 23 ⇒ 12.0                |
| ⇒ 2.0 Seat belt buckle switch (S68/1 or S68/2) | Open and close doors.<br>Ignition: <b>ON</b>                  | Both seat belts extend.  | 23 ⇒ 1.0, 2.0, 4.0                  | 23 ⇒ 1.0, 3.0, 5.0       |
|  | Within 30 seconds connect seat belt latch tongue into buckle. | Both seat belts retract. | 23 ⇒ 2.0                            | 23 ⇒ 3.0                 |
| ⇒ 3.0 Seat belt extender                       | Open and close doors.<br>Ignition: <b>ON</b>                  | Both seat belts extend.  | 23 ⇒ 1.0                            | 23 ⇒ 1.0                 |
|  | Within 30 seconds turn ignition key to position "0".          | Both seat belts retract. | SBE control module (N42)            | SBE control module (N42) |
| ⇒ 4.0 Door switch (S17/3 or S17/4)             | Ignition: <b>ON</b>   | Seat belts extend.       | 23 ⇒ 1.0, 4.0                       | 23 ⇒ 1.0, 5.0            |
|  | Within 30 seconds open the left/right door.                   | Seat belts retract.      |                                     |                          |
|  | Close the left/right door.                                    | Seat belts extend.       |                                     |                          |

1) Observe Preparation for Test, see 22.

Diagnosis – Function Test

| Test step/Test scope                      | Test condition  | Nominal value   | Possible cause/Remedy <sup>1)</sup> |               |
|---|---|---|-------------------------------------|---------------|
|   |   |   | Left SBE                            | Right SBE     |
| ⇒ 5.0 Force limit switch (A10s3 or A11s3) | Open and close doors.<br>Ignition: <b>ON</b>  | Both seat belt extenders protract.  | 23 ⇒ 1.0, 7.0                       | 23 ⇒ 1.0, 3.0 |
|   | While the seat belt is extended, apply counterforce against and hold the extender arm with the palm of your hand. | Exxtender stops and immediately retracts (this will happen a maximum of 8 times, then the system will deactivate. <sup>2)</sup> | 23 ⇒ 9.0                            | 23 ⇒ 13.0     |

1) Observe Preparation for Test, see 22.

2) To repower the seat belt extender system, cycle ignition key OFF/ON.

Diagnosis – Complaint Related Diagnostic Chart

| Complaint/Problem                   | Possible cause  | Test step/Remedy <sup>1)</sup>   |   |
|-------------------------------------|---|--|---|
|                                     |   | Left SBE   | Right SBE   |
| Seat belt does not extend.          | System has been deactivated <sup>2)</sup> .<br><br>Voltage supply to SBE control module (N42)<br>Door switch (S17/3 or S17/4).<br>Seat belt buckle switch (S68/1 or S68/2).<br>SBE motor (A10m1 or A11m1).<br>Extender arm “retracted” switch (A10s1 or A11s1).<br>Force limit switch (A10s3 or A11s3). | Ignition:<br><b>ON/OFF</b><br>23 ⇒ 1.0<br>23 ⇒ 4.0<br>23 ⇒ 2.0<br>23 ⇒ 6.0<br>23 ⇒ 7.0<br>23 ⇒ 9.0 | Ignition:<br><b>ON/OFF</b><br>23 ⇒ 1.0<br>23 ⇒ 5.0<br>23 ⇒ 3.0<br>23 ⇒ 10.0<br>23 ⇒ 11.0<br>23 ⇒ 13.0 |
| Seat belt extends, does not retract | Voltage supply to SBE control module (N42).<br>SBE motor (A10m1 or A11m1).<br>Extender arm “extended” switch (A10s2 or A11s2).  | 23 ⇒ 1.0<br>23 ⇒ 6.0<br>23 ⇒ 8.0   | 23 ⇒ 1.0<br>23 ⇒ 10.0<br>23 ⇒ 12.0  |
| Extender arm sticks or is noisy     | Dirt accumulation/foreign object on extender arm.   | 26 ⇒ 1.0   | 26 ⇒ 1.0  |
| Seat belt extender noisy (pinion)   | Pinion is not properly lubricated.  | 26 ⇒ 2.0   | 26 ⇒ 2.0  |

SBE = Seat Belt Extender

1) Observe Preparation for Test, see 22.

2) System will deactivate if the force limit switch is engaged 8 times. To reactivate system, cycle ignition ON/OFF.

## Electrical Test Program – Component Locations

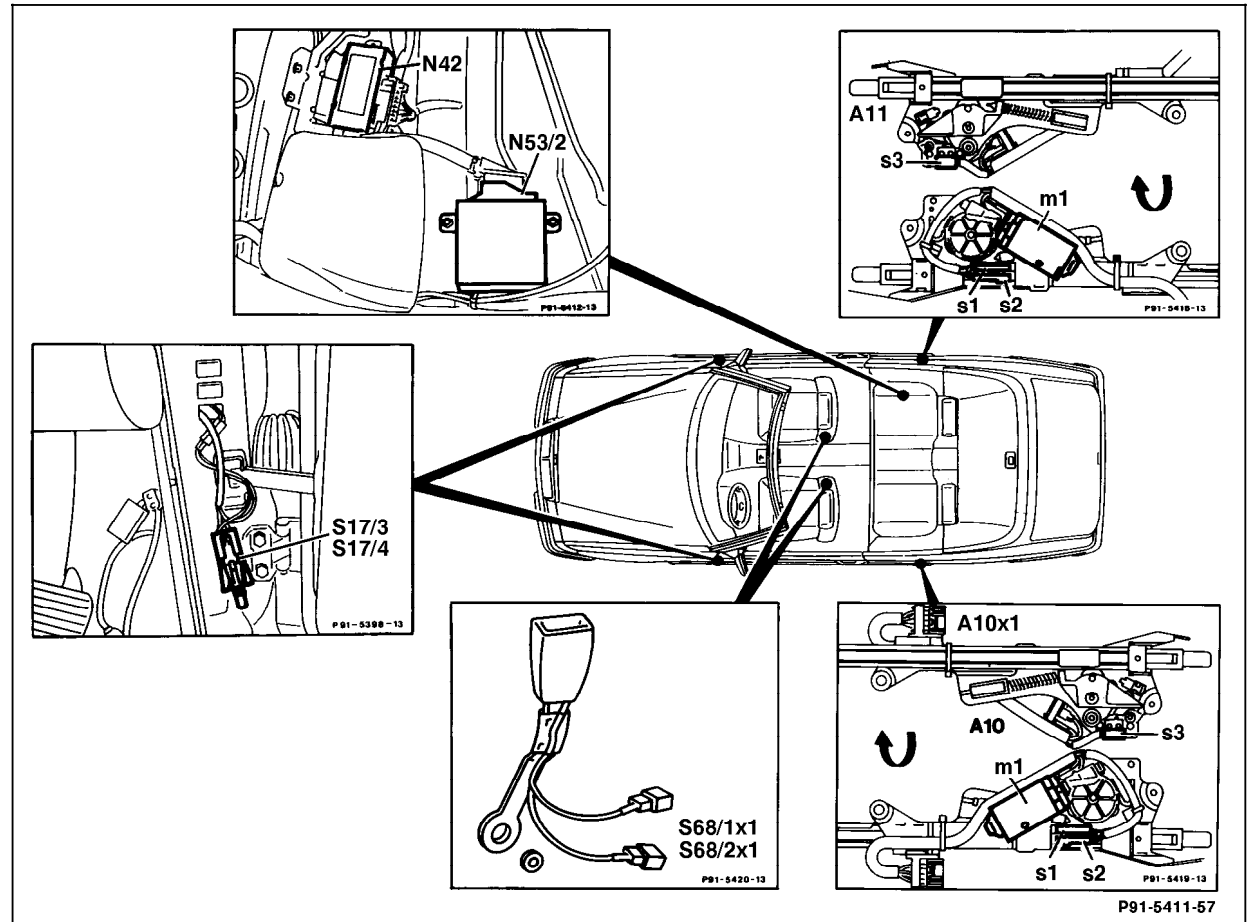


Figure 1

- A10 Left SBE
- A10m1 SBE motor
- A10s1 Extender arm "retracted" switch
- A10s2 Extender arm "extended" switch
- A10s3 Force limit switch
- A10x1 Left SBE connector
- A11 Right SBE
- A11m1 SBE motor
- A11s1 Extender arm "retracted" switch
- A11s2 Extender arm "extended" switch
- A11s3 Force limit switch
- N42 SBE control module
- S17/3 Left door switch
- S17/4 Right door switch
- S68/1 Left front seat belt buckle switch (SBE/reminder)
- S68/1x1 Left front seat belt buckle switch connector (SBE/reminder)
- S68/2 Right front seat belt buckle switch (SBE/reminder)
- S68/2x1 Right front seat belt buckle switch connector (SBE/reminder)

P91-5411-57

## Electrical Test Program – Preparation for Test

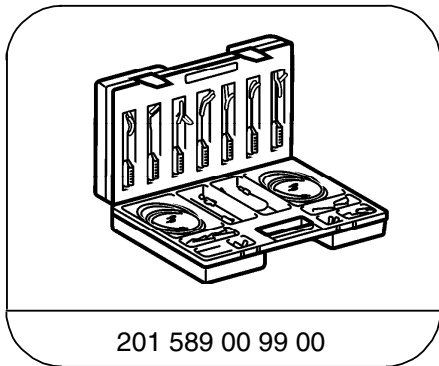
### Test Conditions

1. Battery voltage 11 – 14 V.
2. Fuse no. 1 and relay C [in Fuse/Relay Box (F1)] in proper working condition.

Electrical wiring diagrams :

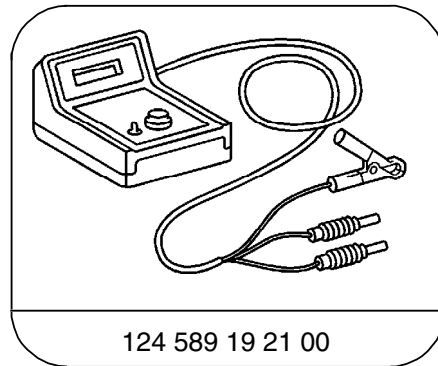
Electrical Troubleshooting Manual, Model 202.

### Special Tools



201 589 00 99 00

Electrical connecting set



124 589 19 21 00


Pulse counter

### Conventional tools, test equipment


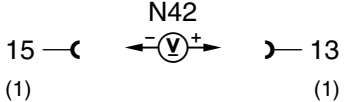
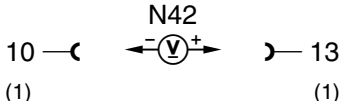


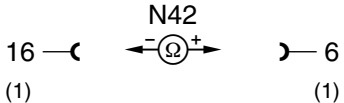
| Description              | Brand, model, etc.          |
|--------------------------|-----------------------------|
| Multimeter <sup>1)</sup> | Fluke models 23, 83, 85, 87 |

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

Electrical Test Program – Test


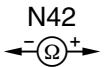


| ⇒   |  | Test scope   | Test connection   | Test condition   | Nominal value                     | Possible cause/Remedy   |
|-----|---|--|---|--|-----------------------------------|---|
| 1.0 |   | <p><b>SBE control module (N42)</b><br/>Voltage supply, circuit 30</p> <p>Voltage supply, circuit 15R</p> | <p>N42<br/>16 —( )— ◀ —(V)— ▶ —( )— 13<br/>(1) (1)</p> <p>N42<br/>16 —( )— ◀ —(V)— ▶ —( )— 11<br/>(1) (1)</p> | <p>Disconnect connector (1) on SBE control module (N42).</p> <p>Ignition: ON<br/>Disconnect connector (1) on SBE control module (N42).</p> | <p>11 – 14 V</p> <p>11 – 14 V</p> | <p>Wiring.</p> <p>Wiring.</p>                                   |
| 2.0 |   | <p><b>Left front seat belt buckle switch (S68/1)</b><br/>Voltage supply</p>                              | <p>N42<br/>9 —( )— ◀ —(V)— ▶ —( )— 13<br/>(1) (1)</p>   | <p>Disconnect connector (1) on SBE control module (N42).</p> <p>Connect seat belt tongue to buckle.</p>                                    | <p>11 – 14 V</p> <p>&lt; 1 V</p>  | <p>Wiring,<br/>Left front seat belt buckle switch (S68/1).</p>  |
| 3.0 |   | <p><b>Right front seat belt buckle switch (S68/2)</b><br/>Voltage supply</p>                             | <p>N42<br/>8 —( )— ◀ —(V)— ▶ —( )— 13<br/>(1) (1)</p>   | <p>Disconnect connector (1) on SBE control module (N42).</p> <p>Connect seat belt tongue to buckle.</p>                                    | <p>11 – 14 V</p> <p>&lt; 1 V</p>  | <p>Wiring,<br/>Right front seat belt buckle switch (S68/2).</p> |

Electrical Test Program – Test


| ⇒   |  | Test scope  | Test connection  | Test condition   | Nominal value      | Possible cause/Remedy                                    |
|-----|---|---|--|--|--------------------|--|
| 4.0 |   | <b>Left door switch (S17/3)</b><br>Voltage supply                 |    | Disconnect connector (1) on SBE control module (N42).<br>Left door:<br>Open<br>Closed  | < 1 V<br>11 – 14 V | Wiring,<br>Left door switch (S17/3).                     |
| 5.0 |   | <b>Right door switch (S17/4)</b><br>Voltage supply                |    | Disconnect connector (1) on SBE control module (N42).<br>Right door:<br>Open<br>Closed | < 1 V<br>11 – 14 V | Wiring,<br>Right door switch (S17/4).                    |
| 6.0 |   | <b>Left SBE motor (A10m1)</b><br>Resistance                       |   | Disconnect connector (1) on SBE control module (N42).                                  | 1.2 – 3.0 Ω        | Wiring,<br>Left SBE motor (A10m1).                       |
| 7.0 |   | <b>Left extender arm “retracted” switch (A10s1)</b><br>Resistance |  | Seat belt extender arm retracted.  | < 1 Ω              | Wiring,<br>Left extender arm “retracted” switch (A10s1). |
| 8.0 |   | <b>Left extender arm “extended” switch (A10s2)</b><br>Resistance  |  | Seat belt extender arm extended.<br>Pull on extender arm.                              | > 20 kΩ<br>< 1 Ω   | Wiring,<br>Left extender arm “extended” switch (A10s2).  |



Electrical Test Program – Test

| ⇒    |  | Test scope   | Test connection   | Test condition   | Nominal value   | Possible cause/Remedy   |
|------|---|--|---|--|---|---|
| 9.0  |   | <b>Force limit switch (A10s3)</b>                                  |   | Open and close the door.<br>Ignition: <b>ON</b><br><br>While the seat belt is being extended, apply counter-force against the extender arm with the palm of your hand. | Seat belt extends.<br><br>Seat belt immediately retracts. | Wiring,<br>Extender arm binding,<br>Force limit switch (A10s3). |
| 10.0 |   | <b>Right SBE motor (A11m1)</b><br>Resistance                       |    | Disconnect connector (2) on SBE control module (N42).  | 1.2 – 3.0 Ω   | Wiring,<br>Right SBE motor (A11m1).                             |
| 11.0 |   | <b>Right extender arm “retracted” switch (A11s1)</b><br>Resistance |   | Seat belt extender arm retracted.  | < 1 Ω   | Wiring,<br>Right extender arm “retracted” switch (A11s1).       |
| 12.0 |   | <b>Right extender arm “extended” switch (A11s2)</b><br>Resistance  |  | Seat belt extender arm extended.<br><br>Pull on extender arm.  | > 20 kΩ<br><br>< 1 Ω                                      | Wiring,<br>Right extender arm “extended” switch (A11s2).        |

Electrical Test Program – Test

| ⇒    |  | Test scope                        | Test connection | Test condition   | Nominal value   | Possible cause/Remedy   |
|------|---|-----------------------------------|-----------------|--|---|---|
| 13.0 |   | <b>Force limit switch (A11s3)</b> |                 | Open and close the door.<br>Ignition: <b>ON</b><br><br>While the seat belt is being extended, apply counter-force against the extender arm with the palm of your hand. | Seat belt extends.<br><br>Seat belt immediately retracts. | Wiring,<br>Extender arm binding,<br>Force limit switch (A11s3). |

Electrical Test Program – Test

| Designation                            | Connection to SBE control module (N42), connector 1           | Nominal value | Connection to SBE control module (N42), connector 1 or 2     | Nominal value |
|--|---|---------------|--|---------------|
| <b>Door switch</b>                     | <b>Left door switch (S17/3)</b>                               |               | <b>Right door switch (S17/4)</b>                             |               |
| Door: open                             | 16 —(1) ←(Ω)→ 15 (1) > 20 kΩ                                  |               | 16 —(1) ←(Ω)→ 10 (1) > 20 kΩ                                 |               |
| Door: closed                           | 16 —(1) ←(Ω)→ 15 (1) < 1 Ω                                    |               | 16 —(1) ←(Ω)→ 10 (1) < 1 Ω                                   |               |
| <b>Seat belt buckle switch</b>         | <b>Left buckle switch (S68/1)</b>                             |               | <b>Right buckle switch (S68/2)</b>                           |               |
| Buckle: buckled                        | 16 —(1) ←(Ω)→ 9 (1) > 20 kΩ                                   |               | 16 —(1) ←(Ω)→ 8 (1) > 20 kΩ                                  |               |
| Buckle: not buckled                    | 16 —(1) ←(Ω)→ 9 (1) < 1 Ω                                     |               | 16 —(1) ←(Ω)→ 8 (1) < 1 Ω                                    |               |
| <b>Extender arm “retracted“ switch</b> | <b>Left switch (A10s1)</b>                                    |               | <b>Right switch (A11s1)</b>                                  |               |
|  | 16 —(1) ←(Ω)→ 5 (1) < 1 Ω <sup>1)</sup> > 20 kΩ <sup>2)</sup> |               | 7 —(2) ←(Ω)→ 5 (2) < 1 Ω <sup>1)</sup> > 20 kΩ <sup>2)</sup> |               |
|  | 16 —(1) ←(Ω)→ 4 (1) > 20 kΩ <sup>1)</sup> < 1 Ω <sup>2)</sup> |               | 7 —(2) ←(Ω)→ 4 (2) > 20 kΩ <sup>1)</sup> < 1 Ω <sup>2)</sup> |               |

1) Value with seat belt retracted.

2) Value with seat belt extended.

Electrical Test Program – Test

| Designation                           | Connection to SBE control module (N42), connector 1                    | Nominal value | Connection to SBE control module (N42), connector 1 or 2                    | Nominal value |
|---------------------------------------|--|---------------|---|---------------|
| <b>Extender arm “extended“ switch</b> | <b>Left switch (A10s2)</b><br>16 —( — ← ⊖ ⊕ → — 6 ) > 20 kΩ<br>(1) (1) |               | <b>Right door switch (A11s2)</b><br>7 —( — ← ⊖ ⊕ → — 6 ) > 20 kΩ<br>(2) (2) |               |
| <b>Force limit switch</b>             | <b>Left switch (A10s3)</b><br>16 —( — ← ⊖ ⊕ → — 3 ) > 20 kΩ<br>(1) (1) |               | <b>Right switch (A11s3)</b><br>7 —( — ← ⊖ ⊕ → — 3 ) > 20 kΩ<br>(2) (2)      |               |