

### 12.1 Models 202 as of 06/97, 208, 210 as of 03/97

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### Diagnosis – Function Test, DTC

Function test:

Switch ignition to position 1, press horn switch (S4/2). Horn sounds.



#### Function Test Explanation

Signal pickup and activation module (SAM) left front (N10/1) and electronic ignition lock control module (N73) both control the horn function.

Horn function can be checked using HHT. Horn function test with HHT can be conducted through:

- SAM control module (N10/1) or
- Horn function

Function test:

Switch ignition to position 1, press horn switch (S4/2). Horn sounds.

There are following functions to choose from:

1. Control module version coding
2. Diagnostic Trouble Code (DTC) Memory
3. Actual values
4. Activation

#### **Caution:**

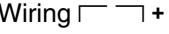

To prevent damage to the control modules, the connectors on the control modules must only be removed or connected with the ignition **OFF**.

### Diagnosis – Complaint Related Diagnostic Chart

| Complaint/Problem  | Possible cause  | Test step/Remedy <sup>1)</sup>  |
|--|---|---|
| Horn does not function   | <p>Wiring</p> <p>Fanfare horns (H2), horn relay (K40/2k6)</p> <p>Driver-side fuse and relay module box (K40/2)</p> <p>Horn switch (S4/2)</p> <p>Following causes are possible only if other system do not function properly (turn signals, wipers etc.):</p> <p>CAN Data line between signal pickup and activation module (SAM) left front and electronic ignition lock control module N10/1</p> <p>N73</p> | <p>23 ⇒ 1.0</p> <p>23 ⇒ 2.0</p> <p>23 ⇒ 4.0</p> <p>23 ⇒ 8.0</p> <p>23 ⇒ 3.0</p> <p>23 ⇒ 5.0</p> |
| Connection between HHT and electronic ignition lock control module (N73) and signal pickup and activation module (SAM) left front (N10/1) not possible | <p>Wiring</p> <p>Electronic ignition lock control module (N73)</p>  | <p>23 ⇒ 3.0</p> <p>23 ⇒ 5.0</p>   |
| Connection between HHT and signal pickup and activation module (SAM) left front (N10/1) not possible   | <p>Following causes are possible only if other system do not function properly (turn signals, wipers etc.):</p> <p>CAN Data line between signal pickup and activation module (SAM) left front (N10/1) and electronic ignition lock control module (N73)</p> <p>N73</p> <p>N10/1</p>   | <p>23 ⇒ 8.0</p> <p>23 ⇒ 5.0</p> <p>23 ⇒ 3.0</p>   |

<sup>1)</sup> Observe Preparation for Test, see 22.

### Diagnosis – Complaint Related Diagnostic Chart

| Complaint/Problem        | Possible cause   | Test step/Remedy <sup>1)</sup>                                       |
|--------------------------|--|--|
| Horn sounds continuously | Wiring  +<br>Horn switch (S4/2), horn/airbag clock spring contact (A45)<br>Horn relay (K40/2k6) <br>Following causes are possible only if other system do not function properly (turn signals, wipers etc.):<br>CAN Data line between signal pickup and activation module (SAM) left front (N10/1) and electronic ignition lock control module (N73)<br>N73<br>N10/1 | 23 ⇒ 4.0<br>23 ⇒ 6.0<br><br><br><br>23 ⇒ 8.0<br>23 ⇒ 5.0<br>23 ⇒ 3.0 |

<sup>1)</sup> Observe Preparation for Test, see 22.

## 12.1 Signaling Device (SD) - Horn

Models 202 as of 06/97, 208, 210 as of 03/97

### Electrical Test Program – Component Locations

#### Model 210

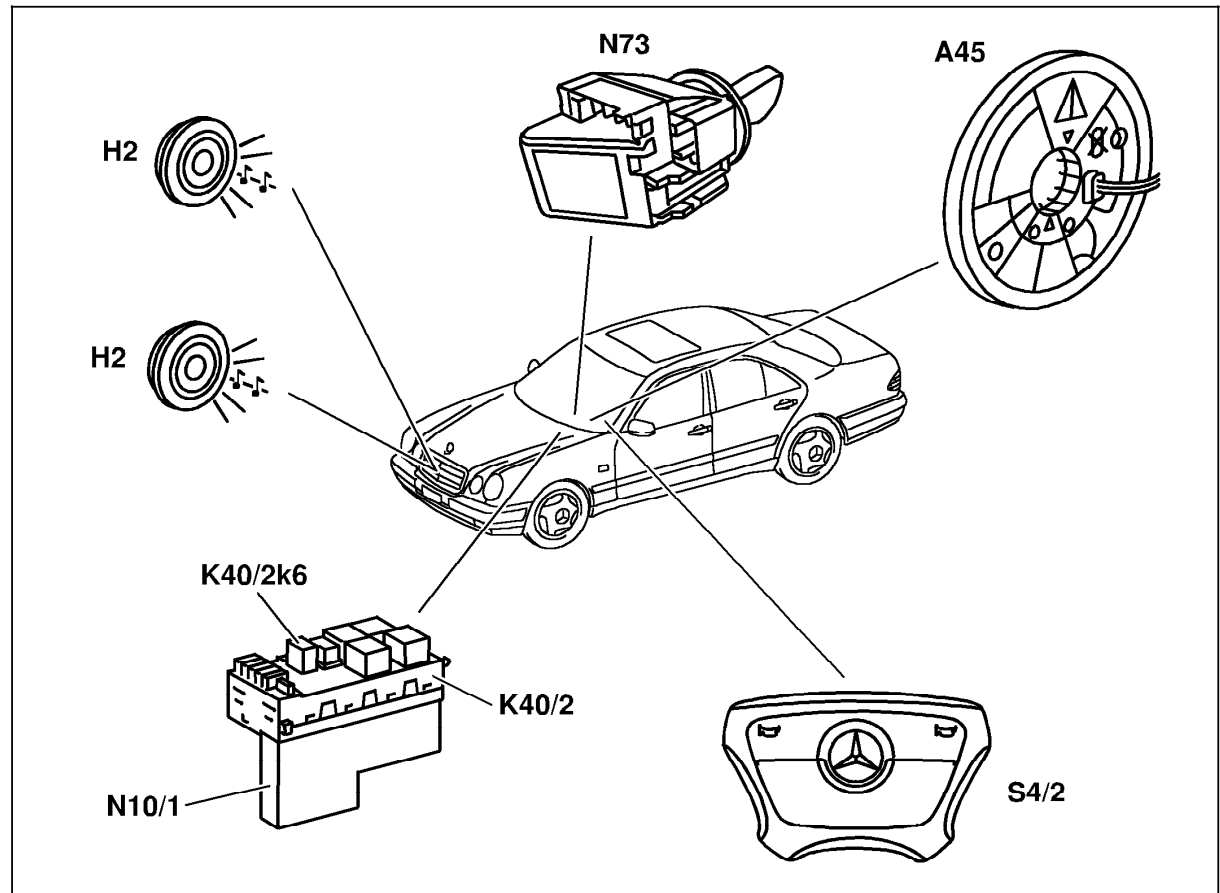


Figure 1

- A45 Horn/airbag clock spring contact
- H2 Fanfare horns
- K40/2 Driver-side fuse and relay module box
- K40/2k6 Horn relay
- N10/1 Signal pickup and activation module (SAM) left front
- N73 Electronic ignition lock control module
- S4/2 Horn switch

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## Electrical Test Program – Component Locations

Components connection

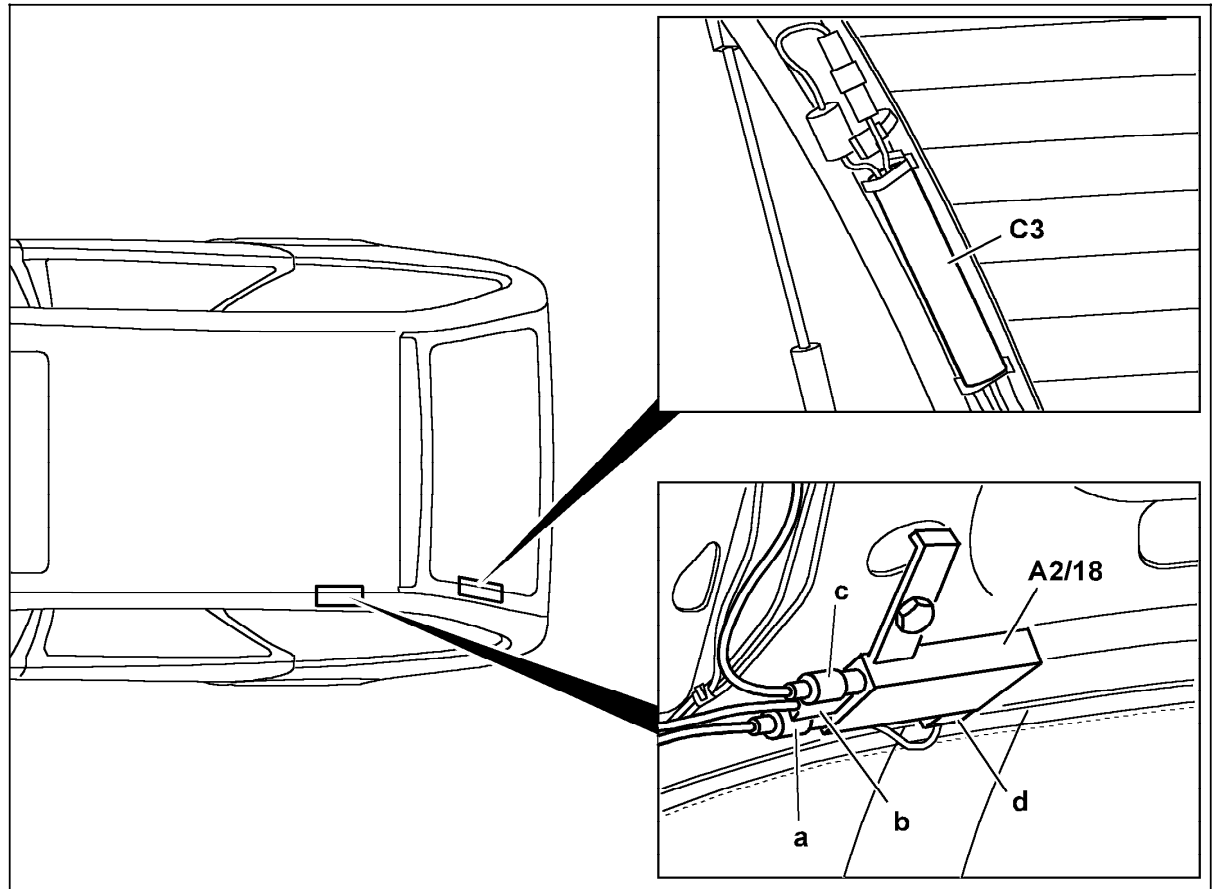


Figure 2

- H2 Fanfare horns
- K40/2 Driver-side fuse and relay module box
- K40/2k6 Horn relay
- N10/1 Signal pickup and activation module (SAM) left front
- N73 Electronic ignition lock control module
- S4/2 Horn switch

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## 12.1 Signaling Device (SD) - Horn

Models 202 as of 06/97, 208, 210 as of 03/97

### Electrical Test Program – Preparation for Test

1. Battery voltage 11–14 V.
2. Check fuses.
3. Systems and fluid levels OK.

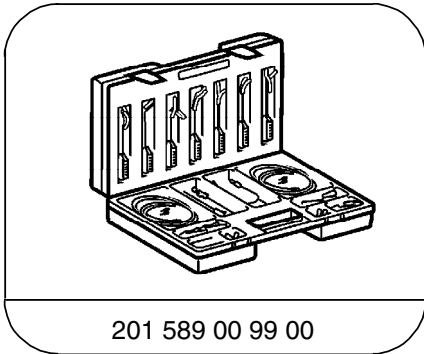
Horn function:  
GF54.35 in WIS

### Electrical wiring diagrams:

Electrical Troubleshooting Manual, Model 202/208

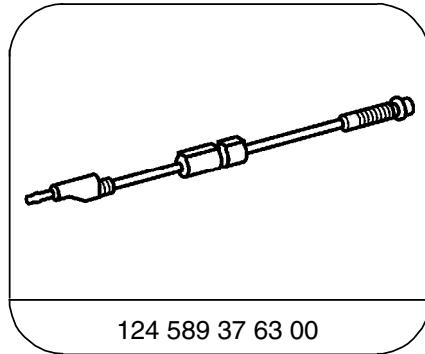
Electrical Troubleshooting Manual, Model 210

### Special Tools



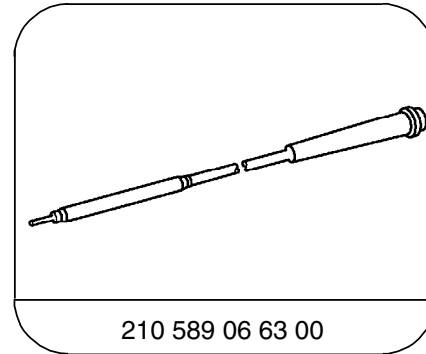
201 589 00 99 00

Electrical connecting set



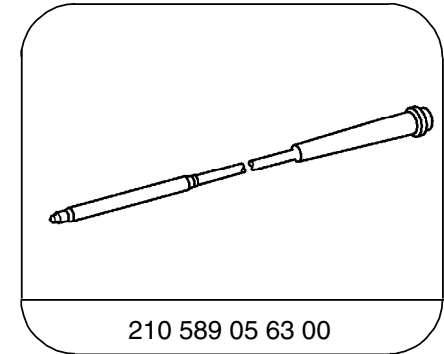
124 589 37 63 00

Fused cable



210 589 06 63 00

Adapter cable



210 589 05 63 00

Adapter cable

### Conventional tools, test equipment

| Description                      | Brand, model, etc.                      |
|----------------------------------|---|
| Digital multimeter <sup>1)</sup> | Fluke Models 23, 77 III, 83, 85, 87, 88 |

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

## 12.1 Signaling Device (SD) - Horn

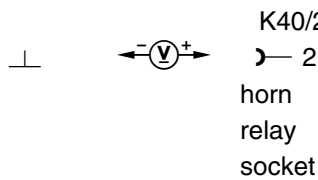
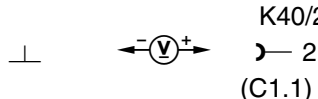
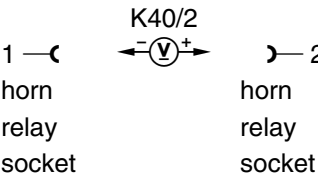
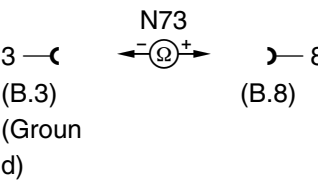
Models 202 as of 06/97, 208, 210 as of 03/97

### Electrical Test Program – Test

| ⇒   | Test scope  | Test connection  | Test condition  | Nominal value       | Possible cause/Remedy                          |
|-----|---|--|---|---------------------|--|
| 1.0 | <b>Fanfare horns H2</b>   | <p>K40/2</p> <p>3 —┐ —┐ 5<br/>horn relay socket    horn relay socket</p>                 | Remove horn relay (K40/2k6)<br>Bridge as shown, see Figure 1  | Fanfare horns sound | ⇒ 2.0,<br>Values OK:<br>⇒ 3.0,                 |
| 2.0 | <b>Driver-side fuse and relay module box K40/2</b><br>Voltage supply for horn relay K40/2k6 | <p>K40/2</p> <p>└┬┘ —┐ 3<br/>horn relay socket</p>                                       | Remove horn relay (K40/2k6)<br>Connect as shown, see Figure 1 | 11 – 14 V           | ⇒ 2.1,<br>f4, f5<br>Values OK:<br>Wiring<br>H2 |
| 2.1 | Driver-side fuse and relay module box K40/2<br>Voltage supply circuit 30                    | <p>K40/2</p> <p>4 —┐ —┐ 2<br/>(C1.4)    (C1.2)</p> <p>4 —┐ —┐ 3<br/>(C1.4)    (C1.3)</p> | Ignition: <b>OFF</b>  | 11 – 14 V           | Wiring,<br>Values OK:<br>K40/2                 |










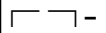


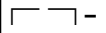


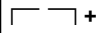


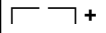


Electrical Test Program – Test

| ⇒   | Test scope  | Test connection   | Test condition  | Nominal value      | Possible cause/Remedy  |
|-----|---|---|---|--------------------|--|
| 3.0 | <b>Signal pickup and activation module (SAM) left front N10/1</b> respectively<br>Driver-side fuse and relay module box K40/2<br>circuit 15R for horn relay K40/2k6 |    | Remove horn relay (K40/2k6)<br>Connect as shown, see Figure 1<br>Ignition switch in position 1  | 11 – 14 V          | ⇒ 3.1,<br>Values OK:<br>⇒ 3.2,   |
| 3.1 | circuit 15R   |    | Ignition switch in position 1   | 11 – 14 V          | Wiring<br>Values OK:<br>K40/2<br>N10/1   |
| 3.2 | Horn relay K40/2k6 control (coil)   |   | Remove horn relay (K40/2k6)<br>Connect as shown, see Figure 1<br>Ignition switch in position 1<br>Horn switch (S4/2):<br>depressed<br>not depressed | 11 – 14 V<br>< 1 V | Wiring<br>S4/2<br>CAN between N73 and N10/1<br>N10/1<br>N73<br>Values OK:<br>K40/2k6 |
| 4.0 | <b>Horn switch S4/2 and wiring</b>  |  | Remove connector B on N73<br>Horn switch (S4/2):<br>depressed<br>not depressed  | < 1 Ω<br>> 20 k Ω  | Wiring<br>A45<br>S4/2  |

Electrical Test Program – Test

| ⇒   | Test scope   | Test connection   | Test condition   | Nominal value | Possible cause/Remedy  |
|-----|--|---|--|---------------|--|
| 5.0 | <b>Electronic ignition lock control module N73</b><br>Voltage supply, circuit 30 | <p>N73</p> <p>3 — ⚡ ← ⊖ ⊕ → 4<br/>(B.3) (A.4)</p> <p>3 — ⚡ ← ⊖ ⊕ → 5<br/>(B.3) (A.5)</p> <p>3 — ⚡ ← ⊖ ⊕ → 7<br/>(B.3) (B.7)</p> | Ignition: <b>OFF</b><br>Loosen connectors A and B on N73 | 11 – 14 V     | Wiring   |
| 6.0 | <b>Horn relay K40/2k6</b><br>□ □ +   |   | Remove horn relay (K40/2k6)                              | Horn sounds   | Wiring<br>□ □ + or in K40/2<br>Values OK and<br>Complaint present with ignition OFF:<br>K40/2k6<br>Values OK and<br>Complaint present with ignition ON:<br>⇒ 4<br>CAN<br>K40/2<br>N10/1<br>N73 |
| 7.0 | <b>HHT interface, connection between N73 and diagnostic connector X11/4</b>      | <p>X11/4 N73</p> <p>20 — ⚡ ← ⊗ ⊕ → 14<br/>(B.14)</p>  | Ignition: <b>OFF</b>                                     | < 1 Ω         | Wiring   |

Electrical Test Program – Test

| ⇒   | Test scope  | Test connection   | Test condition  | Nominal value                                      | Possible cause/Remedy |                 |
|-----|---|---|---|--|-----------------------|-----------------|
| 8.0 | <b>CAN Data line between N10/1 and N73</b><br>-//-  | N73<br>11 —  ← ⊖ ⊕ →<br>(B.11)<br><br>10 —  ← ⊖ ⊕ →<br>(B.10) | N10/1<br>7 — <br>(2.7)<br><br>6 — <br>(2.6) | Remove connector B on N73 and connector 2 on N10/1 | < 1 Ω<br><br>< 1 Ω    | Wiring<br>⇒ 8.1 |
| 8.1 |                            | 6 —  ← ⊖ ⊕ →<br>(2.6)  | N10/1<br>7 — <br>(2.7)   | Remove connector 2 on N10/1                        | > 20 kΩ               | Wiring<br>⇒ 8.2 |
| 8.2 | CAN Data line High<br> -   | 1 —  ← ⊖ ⊕ →<br>(4.1)  | N10/1<br>6 — <br>(2.6)   | Remove connectors 2 and 4 on N10/1                 | > 20 kΩ               | Wiring<br>⇒ 8.3 |
| 8.3 | CAN Data line Low<br> -    | 1 —  ← ⊖ ⊕ →<br>(4.1)  | N10/1<br>7 — <br>(2.7)   | Remove connectors 2 and 4 on N10/1                 | > 20 kΩ               | Wiring<br>⇒ 8.4 |
| 8.4 | CAN Data line High<br> + | 2 —  ← ⊖ ⊕ →<br>(4.2)  | N10/1<br>6 — <br>(2.6)   | Remove connectors 2 and 4 on N10/1                 | > 20 kΩ               | Wiring<br>⇒ 8.5 |
| 8.5 | CAN Data line Low<br> +  | 2 —  ← ⊖ ⊕ →<br>(4.2)  | N10/1<br>7 — <br>(2.7)   | Remove connectors 2 and 4 on N10/1                 | > 20 kΩ               | Wiring          |

### Electrical Test Program – Test



Location driver-side fuse and relay module box (K40/2). Horn relay (K40/2k6) removed.

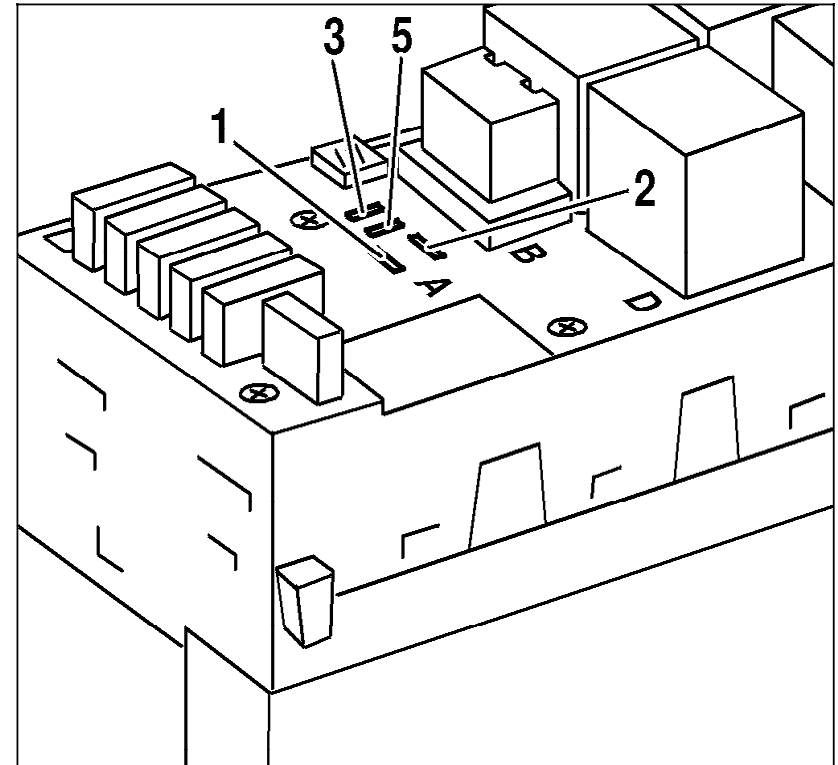


Figure 1

- 1 Relay control - coil
- 2 Circuit 15R - switched voltage
- 3 Circuit 30 voltage
- 5 Horn voltage supply

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