

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

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### Diagnosis – Function Test



#### Function Test Explanation

Signal pickup and activation module (SAM) left front (N10/1) and electronic ignition lock control module (N73) both control the turn signals function and they have to be in perfect working condition.

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

- Signal pickup and activation (SAM) control module (N10/1),
- Electronic ignition lock control module (N73)
- Flasher function

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**.

| Test step/Test sequence                | Test condition   | Nominal value   | Possible cause/Remedy <sup>1)</sup> |
|--|--|---|-------------------------------------|
| Function test turn signal              | Ignition switch in position 2<br>Turn signal switch into right turn signal position                        | All right turn signal lamps flash.<br>Control lamp in the instrument cluster flashe and turn signal audio device sounds |                                     |
|  | Repet above step for left turn signal  | As above  |                                     |
| Function test hazard flasher           | Switch hazard flasher ON   | Turn signal lamps, hazard flasher switch and control lamps in instrument cluster flash. Signal audi device sounds.      |                                     |
| Function test turn signal lamp failure | Remove turn signal lamp (E3e1 or E4e1), ignition switch in position 2.<br>Switch turn signal to the right. | Remaining right turn signal lamps must flash at higher frequency (3 Hz insteadt of 1.5 Hz).                             |                                     |
|  | Repet above step for left turn signal  | As above  |                                     |

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

Diagnosis – Complaint Related Diagnostic Chart

| Complaint/Problem  | Possible cause   | Test step/Remedy <sup>1)</sup>                       |
|--|--|--|
| Turn signals and hazard flasher not functioning  | Signal pickup and activation module (SAM) left front (N10/1)   | 23 ⇒ 1.0   |
| Only turn signals not operative  | Wiring<br>Turn signal switch (S4s1)<br>Following causes are possible only if other systems operate by the combination switch do not function properly (wipers etc.):<br>CAN Data line between signal pickup and activation module (SAM) left front (N10/1) and electronic ignition lock control module (N73) - only if horn also does not function<br>N73<br>N10/1 | 23 ⇒ 5.0<br><br>23 ⇒ 4.0<br><br>23 ⇒ 2.0<br>23 ⇒ 1.0 |
| Only hazard flasher not operative  | Wiring<br>Hazard flasher switch S6/1s1<br><br>N10/1  | 23 ⇒ 6.0<br>23 ⇒ 7.0<br>23 ⇒ 1.0                     |
| Connection between HHT and electronic ignition lock control module (N73) and signal pickup and activation module (SAM) left front (N10/1) not possible | Wiring<br>Electronic ignition lock control module (N73)  | 23 ⇒ 3.0<br>23 ⇒ 2.0                                 |

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

Diagnosis – Complaint Related Diagnostic Chart

| Complaint/Problem  | Possible cause  | Test step/Remedy <sup>1)</sup>  |
|--|---|---|
| Connection between HHT and signal pickup and activation module (SAM) left front (N10/1) not possible | Following causes are possible only if other systems operate by the combination switch do not function properly (wipers, turn signals etc.):<br>CAN Data line between signal pickup and activation module (SAM) left front (N10/1) and electronic ignition lock control module (N73) - only if horn also does not function<br>N73<br>N10/1 | 23 ⇒ 4.0<br><br>23 ⇒ 2.0<br>23 ⇒ 1.0  |
| Only one side of turn signal not operative   | Wiring<br>Turn signal switch S4/s1<br>N73<br>N10/1  | 23 ⇒ 5.0<br>23 ⇒ 2.0<br>23 ⇒ 1.0  |
| Audio device and indicator lamps in instrument cluster not functioning                               | Wiring<br>A1e1, A1e2<br>Instrument cluster A1   | 23 ⇒ 8.0  |
| Failure of single lamp   | Wiring<br>Corresponding lamp:<br><br>left rear<br>left front<br>auxiliary left<br>right rear<br>right front<br>auxiliary right<br><br>N10/1:<br><br>left outputs<br>Right outputs   | 23 ⇒ 9.0<br>23 ⇒ 10.0<br>23 ⇒ 11.0<br>23 ⇒ 12.0<br>23 ⇒ 13.0<br>23 ⇒ 14.0<br><br>23 ⇒ 15.0<br>23 ⇒ 16.0 |

<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

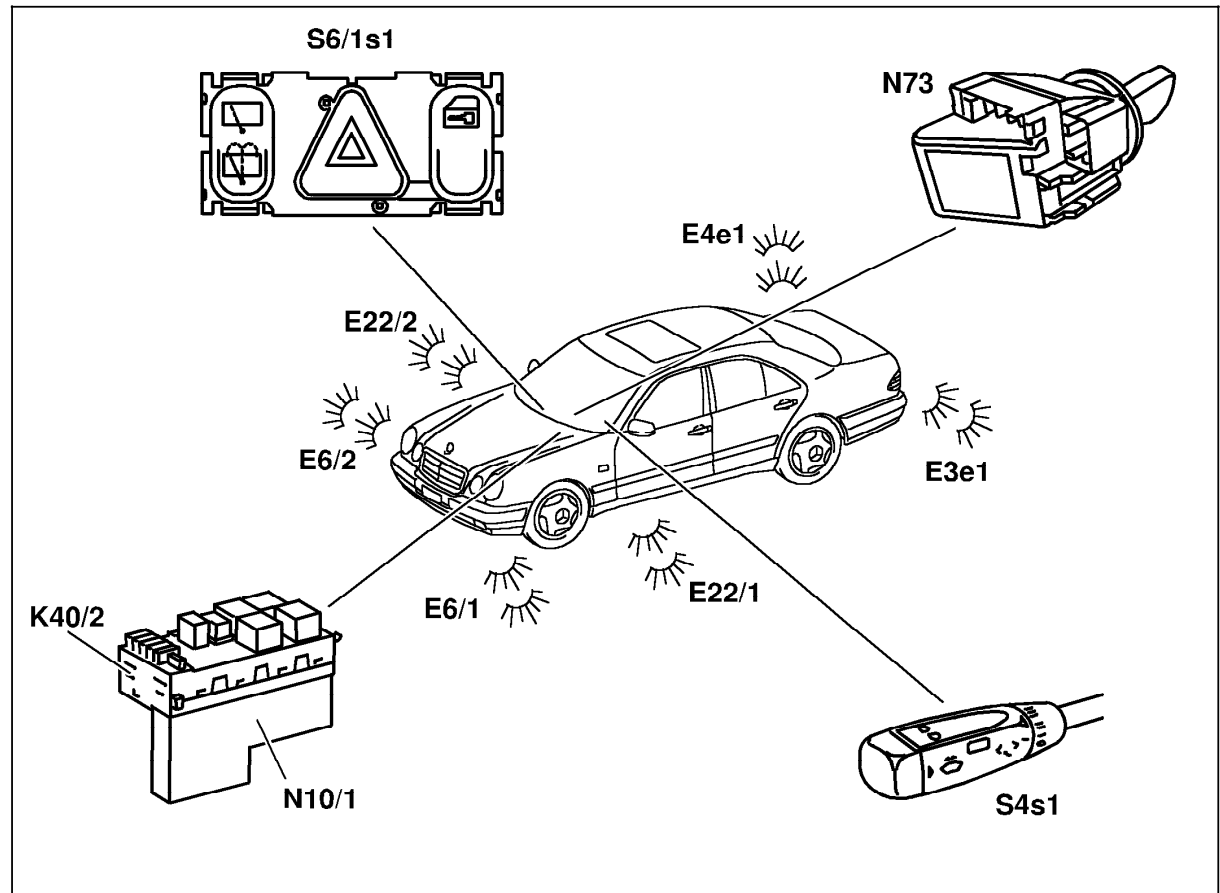


Figure 1

- E3e1 Turn signal lamp left
- E4e1 Turn signal lamp right
- E6/1 Left turn signal lamp
- E6/2 Right turn signal lamp
- E22/1 Left auxiliary turn signal lamp
- E22/2 Right auxiliary turn signal lamp
- K40/2 Driver-side fuse and relay module box
- N10/1 Signal pickup and activation module (SAM) left front
- N73 Electronic ignition lock control module
- S4s1 Turn signal switch
- S6/1s1 Hazard flasher switch

P82.25-0237-06

## Electrical Test Program – Component Locations

Components connection  
Model 210

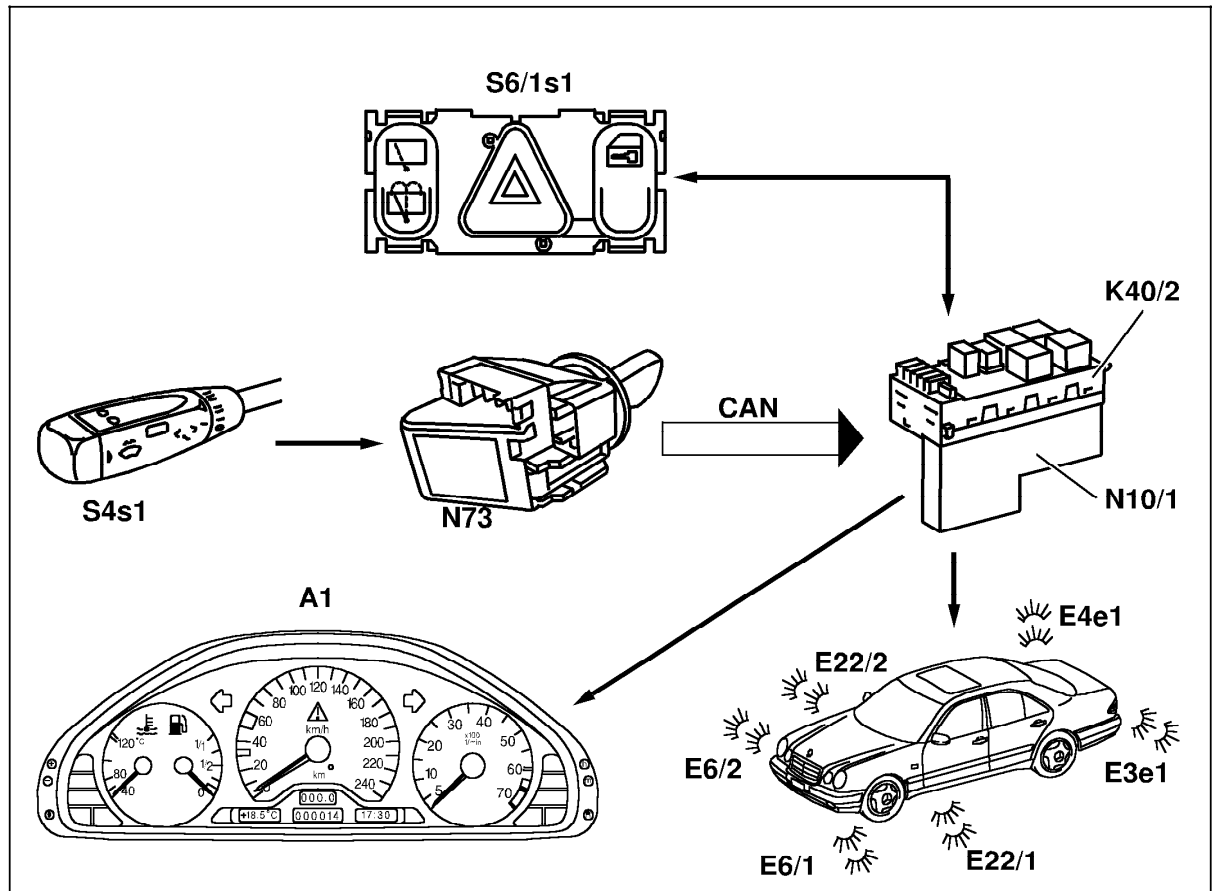


Figure 2

- A1 Instrument cluster
- E3e1 Turn signal lamp left
- E4e1 Turn signal lamp right
- E6/1 Left turn signal lamp
- E6/2 Right turn signal lamp
- E22/1 Left auxiliary turn signal lamp
- E22/2 Right auxiliary turn signal lamp
- K40/2 Driver-side fuse and relay module box
- N10/1 Signal pickup and activation module (SAM) left front
- N73 Electronic ignition lock control module
- S4s1 Turn signal switch
- S6/1s1 Hazard flasher switch

P82.25-0238-06

## 12.2 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.
4. Control lamps OK.

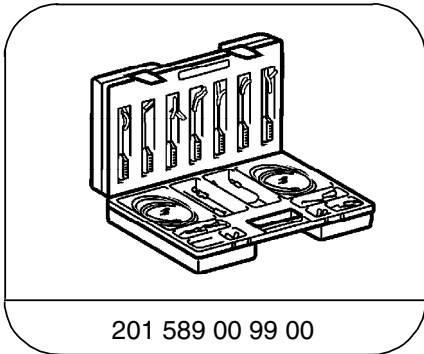
Hazard, turn signals function:  
GF82.25 in WIS

#### Electrical wiring diagrams:

Electrical Troubleshooting Manual, Model 202/208

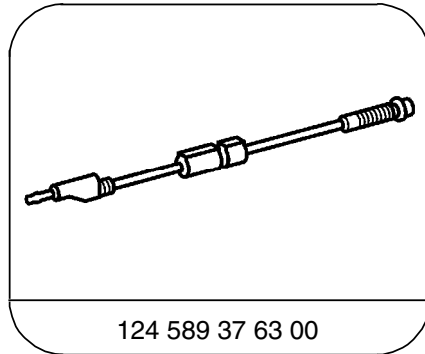
Electrical Troubleshooting Manual, Model 210

#### Special Tools



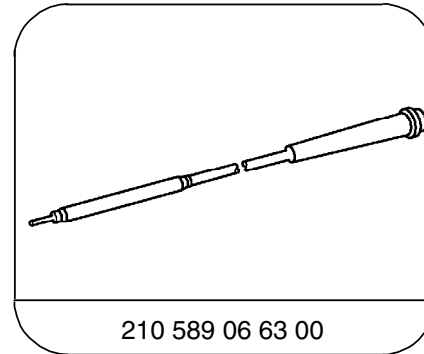
201 589 00 99 00

Electrical connecting set



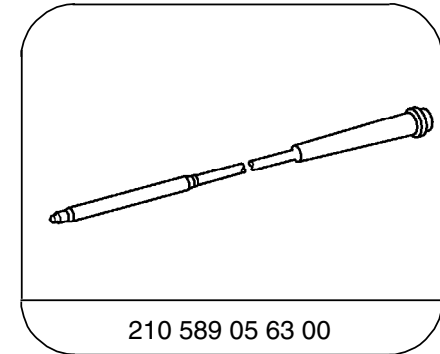
124 589 37 63 00

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 |








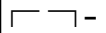


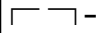


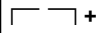


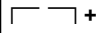


<sup>1)</sup> Available through the MBUSA Standard Service Equipment Program.

Electrical Test Program – Test

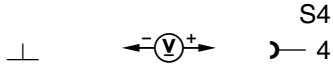
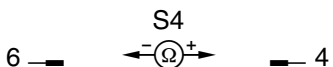
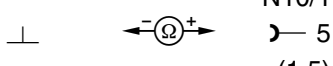
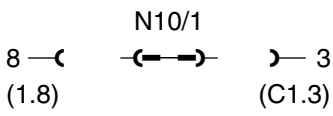
| ⇒   | Test scope   | Test connection   | Test condition   | Nominal value | Possible cause/Remedy |
|-----|--|---|--|---------------|-----------------------|
| 1.0 | <b>Signal pickup and activation module (SAM) left front N10/1</b><br>Voltage supply circuit 30 | <p>N10/1 K40/2<br/>4 —(C1.4) —(V)— 2 (C1.2)</p>   | Remove N10/1<br>Ignition: <b>OFF</b>                     | 11 – 14 V     | Wiring                |
| 2.0 | <b>Electronic ignition lock control module N73</b><br>Voltage supply, circuit 30               | <p>N73<br/>3 —(B.3) —(V)— 4 (A.4)<br/>3 —(B.3) —(V)— 5 (A.5)<br/>3 —(B.3) —(V)— 7 (B.7)</p> | Ignition: <b>OFF</b><br>Loosen connectors A and B on N73 | 11 – 14 V     | Wiring                |
| 3.0 | <b>HHT interface, connection between N73 and diagnostic connector X11/4</b>                    | <p>X11/4 N73<br/>20 —(Ω)— 14 (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 |                 |
|-----|---|---|---|--|-----------------------|-----------------|
| 4.0 | <b>CAN Data line between N10/1 and N73</b><br>-//-  | N73<br>11 —  ← ⊖ ⊕ →<br>(B.11) | N10/1<br>7 — <br>(2.7)   | Remove connector B on N73 and connector 2 on N10/1 | < 1 Ω                 | Wiring<br>⇒ 4.1 |
|     |   | 10 —  ← ⊖ ⊕ →<br>(B.10)        | 6 — <br>(2.6)            |  | < 1 Ω                 |                 |
| 4.1 |                            | 6 —  ← ⊖ ⊕ →<br>(2.6)          | N10/1<br>7 — <br>(2.7)   | Remove connector 2 on N10/1                        | > 20 kΩ               | Wiring<br>⇒ 4.2 |
| 4.2 | 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>⇒ 4.3 |
| 4.3 | 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>⇒ 4.4 |
| 4.4 | 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>⇒ 4.5 |
| 4.5 | 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

| ⇒   | Test scope   | Test connection   | Test condition   | Nominal value                            | Possible cause/Remedy                               |
|-----|--|---|--|--|---|
| 5.0 | <b>Turn signal switch S4s1</b><br>Voltage supply circuit 15R |    | Remove connector from S4<br>Circuit 15R:<br>ON<br>OFF                            | < 1 V<br>11 – 14 V                       | Wiring<br>model 210: f3<br>model 208: f22<br>⇒ 5.1, |
| 5.1 | Turn signal switch S4s1 resistance                           |    | Remove connector from S4<br>Turn signal switch position:<br>right<br>left<br>off | < 1 Ω<br>196 - 204 Ω<br>> 20 kΩ          | S4  |
| 6.0 | <b>Hazard flasher switch S6/1s1</b><br><b>resistance</b>     |    | Loosen connector 1 on N10/1<br>Hazard flasher switch:<br>on<br>off               | < 1 Ω<br>> 20 kΩ                         | Wiring,<br>S6/1s1                                   |
| 7.0 | <b>Hazard flasher switch S6/1s1</b><br><b>indicator lamp</b> |  | Loosen connector 1 and C1 on N10/1   | Indicator lamp on the switch illuminates | Wiring,<br>S6/1s1<br>Values OK:<br>N10/1            |







Electrical Test Program – Test

| ⇒    | Test scope   | Test connection  | Test condition                           | Nominal value  | Possible cause/Remedy                      |
|------|--|--|--|--|--|
| 8.0  | <b>Instrument cluster A1</b><br>Audible turn signal indicator A1h2,<br>Left and right turn signal indicator<br>A1e1 and A1e2 | N10/1<br>2 —( )— (C1.2) —( )— 5<br>2 —( )— (C1.2) —( )— 5<br>(2.4) | Remove connectors 2 and<br>C1 from N10/1 | Indicator lamps<br>in the<br>instrument<br>cluster must<br>illuminate.<br>Audio indicator<br>must be heard<br>when<br>connecting and<br>disconnecting<br>the bridge. | Wiring<br>A1e<br>A1<br>Values OK:<br>N10/1 |
| 9.0  | <b>Turn signal lamp E3e1</b><br>left rear taillamp unit  | 2 —( )— (C1.2) —( )— 7<br>(4.7)                                    | Remove connectors 4 and<br>C1 from N10/1 | Lamp<br>illuminates  | Wiring,<br>Lamp or socket<br>⇒ 15          |
| 10.0 | <b>Left turn signal/side marker lamp<br/>E6/1</b>  | 2 —( )— (C1.2) —( )— 3<br>(5.3)                                    | Remove connectors 5 and<br>C1 from N10/1 | Lamp<br>illuminates  | Wiring,<br>Lamp or socket<br>⇒ 15          |
| 11.0 | <b>Left auxiliary turn signal lamp<br/>E22/1</b>   | 2 —( )— (C1.2) —( )— 4<br>(5.4)                                    | Remove connectors 5 and<br>C1 from N10/1 | Lamp<br>illuminates  | Wiring,<br>Lamp or socket<br>⇒ 15          |

Electrical Test Program – Test

| ⇒    | Test scope  | Test connection   | Test condition   | Nominal value                              | Possible cause/Remedy             |
|------|---|---|--|--|-----------------------------------|
| 12.0 | <b>Turn signal lamp E4e1</b><br>right rear taillamp unit                          | 2 —(C) — (←→) — 8<br>(C1.2) (4.8)   | Remove connectors 4 and C1 from N10/1                                      | Lamp illuminates                           | Wiring,<br>Lamp or socket<br>⇒ 16 |
| 13.0 | <b>Right turn signal/side marker lamp E6/2</b>                                    | 2 —(C) — (←→) — 1<br>(C1.2) (5.1)   | Remove connectors 5 and C1 from N10/1                                      | Lamp illuminates                           | Wiring,<br>Lamp or socket<br>⇒ 16 |
| 14.0 | <b>Right auxiliary turn signal lamp E22/2</b>                                     | 2 —(C) — (←→) — 2<br>(C1.2) (5.2)   | Remove connectors 5 and C1 from N10/1                                      | Lamp illuminates                           | Wiring,<br>Lamp or socket<br>⇒ 16 |
| 15.0 | <b>Signal pickup and activation module (SAM) left front N10/1</b><br>Left outputs | N10/1<br>4 —(C) — (←Ⓜ→) — 7<br>(C1.4) (4.7)<br><br>4 —(C) — (←Ⓜ→) — 3<br>(C1.4) (5.3)<br><br>4 —(C) — (←Ⓜ→) — 4<br>(C1.4) (5.4) | All connectors plugged in<br>Ignition: <b>ON</b><br>Apply left turn signal | 11 – 14 V pulsing in turn signal frequency | N10/1                             |

Electrical Test Program – Test

| ⇒    | Test scope   | Test connection  | Test condition  | Nominal value                                       | Possible cause/Remedy |
|------|--|--|---|---|-----------------------|
| 16.0 | <b>Signal pickup and activation module (SAM) left front N10/1</b><br>Right outputs | N10/1<br>4 —   8<br>(C1.4) (4.8)<br><br>4 —   1<br>(C1.4) (5.1)<br><br>4 —   2<br>(C1.4) (5.2) | All connectors plugged in<br>Ignition: <b>ON</b><br>Apply right turn signal | 11 – 14 V<br>pulsing in turn<br>signal<br>frequency | N10/1                 |