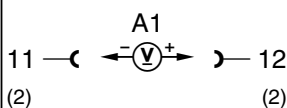
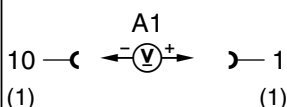
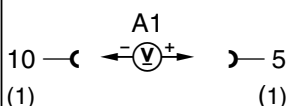
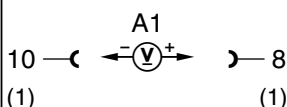



## Electrical Test Program – Test

| Test step<br>Test mode | Test scope   | Test connection  | Test condition   | Nominal value                                | Possible cause/Remedy                          |
|------------------------|--|--|--|--|--|
| ⇒ 1.0                  | <b>Instrument cluster (A1)</b><br>Voltage supply<br>Circuit 30 |   | Remove A1<br>Disconnect connector 2  | 11 – 14 V                                    | Wiring,<br>⇒ 1.1                               |
| ⇒ 1.1                  | Voltage supply<br>Circuit 15, unfused                          |   | Remove A1<br>Disconnect connector 1<br>Ignition: <b>ON</b>                           | 11 – 14 V                                    | Wiring,<br>⇒ 1.2                               |
| ⇒ 1.2                  | Voltage supply<br>Circuit 15, fused                            |   | Remove A1<br>Disconnect connector 1<br>Ignition: <b>ON</b>                           | 11 – 14 V                                    | Wiring,<br>Values OK: electronic circuit board |
| ⇒ 2.0                  | <b>Instrument cluster (A1)</b><br>Illumination                 |  | Remove A1<br>Disconnect connector 1<br>Ignition: <b>ON</b><br>Turn on parking lights | 11 – 14 V                                    | Wiring,<br>Rotary light switch (S1)            |
| ⇒ 3.0                  | <b>1 Fuel level gauge (A1p2)</b>                               |  | Activate test mode 1   | Analog fuel gauge reading<br>digital readout | A1p2,<br>⇒ 3.1                                 |

## Electrical Test Program – Test

| Test step<br>Test mode | Test scope                                      | Test connection   | Test condition   | Nominal value   | Possible cause/Remedy    |
|------------------------|---|---|--|---|--------------------------|
| ⇒ 3.1<br>6 – 9         | Fuel level gauge (A1p2)                         |   | Activate test modes 6 – 9  | Figure 3 – 6  | A1p2,<br>⇒ 3.2           |
| ⇒ 3.2                  | Wires and connections or fuel level sensor (B4) |  | Ignition: <b>OFF</b><br>Disconnect connector at B4.<br>Connect resistance substitution unit.<br>Ignition: <b>ON</b><br><b>Resistance substitution unit setting:</b><br>$70 \pm 3 \Omega$<br>$62 \pm 1 \Omega$<br>$53 \pm 2 \Omega$<br>$37 \pm 2 \Omega$<br>$21 \pm 2 \Omega$<br>$5 \pm 2 \Omega$<br><b>Note:</b><br>Before changing each resistance value, the ignition must be turned off and then turned on again. | <b>Display in A1p2:</b><br>$= 0$ <sup>1)</sup><br>$= \text{Res.}$ <sup>1)</sup><br>$= 1/4$<br>$= 1/2$<br>$= 3/4$<br>$= 1/1$ | Wiring,<br>values OK: B4 |

<sup>1)</sup> Fuel reserve warning lamps light up.

## Electrical Test Program – Test

| Test step<br>Test mode | Test scope                                | Test connection | Test condition  | Nominal value   | Possible cause/Remedy     |
|------------------------|---|-----------------|---|---|---------------------------|
| ⇒ 4.0<br>2             | <b>Fuel consumption indicator (A1p10)</b> |                 | Engine: <b>at Idle</b><br>Activate test mode 2<br>Increase engine rpm | With increasing rpm the consumption in l/h increases.<br><b>Note:</b><br>Reading on digital display only. The analog reading shows ∞. | ⇒ 4.1                     |
| ⇒ 4.1<br>6 – 8         | A1p10                                     |                 | Activate test modes 6 – 8   | See Figures 3 – 5   | A1p10,<br>⇒ 4.2,<br>⇒ 4.3 |

## Electrical Test Program – Test

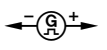
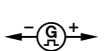
| Test step<br>Test mode | Test scope   | Test connection                  | Test condition  | Nominal value  | Possible cause/Remedy   |
|------------------------|--|----------------------------------|---|--|---|
| ⇒ 4.2<br>2             | Fuel consumption signal from CFI control module (N3)<br><br><b>Engine 104, 119 CFI</b> | <p>W16 ← (⊖ ⊕) → 8</p> <p>N3</p> | <p>Disconnect N3. Connect signal generator (Figure 9) and set to a voltage amplitude of approx. 10 V.<br/>Ignition: <b>ON</b><br/>Activate test mode 2.</p> | <p>50 HZ = 5 l/h<br/>100 HZ = 10 l/h<br/>150 HZ = 15 l/h<br/>200 HZ = 20 l/h</p> <p><b>Note:</b><br/>The readout is only visible on the digital display.<br/>The analog reading shows ∞.</p> | <p>Wiring.</p> <p><b>Note:</b><br/>If no consumption (l/h) is indicated at idle speed and connected CFI control module (N3), replace the CFI control module (N3).</p> <p>If no plausible values are indicated while driving, the speed signal is missing.<br/>Replace electronic circuit board.</p> |

## Electrical Test Program – Test

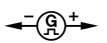
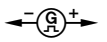
| Test step<br>Test mode | Test scope  | Test connection   | Test condition  | Nominal value  | Possible cause/Remedy   |
|------------------------|---|---|---|--|---|
| ⇒ 4.3                  | Fuel consumption signal from LH-SFI control module (N3/1 or N3/3)<br><br><b>Engine 119, 120 LH-SFI</b><br><br><b>Engine 104 HFM-SFI</b> | <div> <p>N3/1 or N3/3<br/>W16 <math>\leftarrow \text{G/H} \rightarrow</math> 9 (1)</p> </div> <div> <p>N3/4<br/>W16 <math>\leftarrow \text{G/H} \rightarrow</math> 7 (1)</p> </div> | Ignition: <b>OFF</b><br>Remove N3/1, N3/3 or N3/4 (Figure 15, 16 and 17)<br>Connect signal generator and set to a voltage amplitude of approx. 10 V (Figure 18)<br>Ignition: <b>ON</b><br>Activate test mode 2. | 25 HZ = 5 l/h<br>50 HZ = 10 l/h<br>75 HZ = 15 l/h<br>100 HZ = 20 l/h<br><br><b>Note:</b><br>The readout is only visible on the digital display.<br>The analog reading shows ∞. | Wiring,<br>Electronic circuit board,<br>Values OK: N3/1, N3/3 or N3/4<br>Engines, Volume 2 – 1.1 23 or 3.1 23 or 3.2 23<br><br><b>Note:</b><br>If no plausible values are indicated while driving and the speedometer is functioning correctly, replace electronic circuit board. |
| ⇒ 5.0                  | <b>3 Oil pressure gauge with warning lamp (A1p3)</b>  |   | Engine: <b>at Idle</b><br>Activate test mode 3.<br>Increase engine rpm  | Analog reading<br>digital readout.<br>The oil pressure increases with increasing engine rpm.   | A1p3,<br>⇒ 5.1  |



## Electrical Test Program – Test

| Test step<br>Test mode | Test scope                          | Test connection   | Test condition  | Nominal value  | Possible cause/Remedy   |
|------------------------|-------------------------------------|---|---|--|---|
| ⇒ 7.0                  | 4 Tachometer (A1p5)                 |   | Engine: <b>at Idle</b><br>Activate test mode 4,<br>increase engine rpm  | Analog<br>tachometer<br>reading digital<br>readout     | Wiring and connections,<br>TN - signal from ignition control<br>module (N1/3),<br>A1p5,<br>Engine systems control<br>module (N16),<br>⇒ 7.1 – 7.3 |
| ⇒ 7.1                  | Tachometer (A1p5)<br>Engine 104 CFI | W3  N1/3<br>4<br>(A)   | Disconnect plug A on N1/3<br>(Figure 1)<br>Connect signal generator<br>and set to a voltage<br>amplitude of approx. 10 V<br>Ignition: <b>ON</b>   | Readout<br>50 HZ =<br>1000 rpm<br>194 HZ =<br>4000 rpm | Wiring,<br>N16,<br>Values OK: N1/3.   |
| ⇒ 7.2                  | Tachometer (A1p5)<br>Engine 119 CFI | W3  N1/3<br>4<br>(A) | Disconnect plug A on N1/3<br>(Figure 1).<br>Connect signal generator<br>and set to a voltage<br>amplitude of approx. 10 V.<br>Ignition: <b>ON</b> | Readout<br>70 Hz =<br>1000 rpm<br>270 Hz =<br>4000 rpm | Wiring,<br>N16,<br>Values OK: N1/3.   |

## Electrical Test Program – Test


| Test step<br>Test mode | Test scope   | Test connection  | Test condition   | Nominal value  | Possible cause/Remedy  |
|------------------------|--|--|--|--|--|
| ⇒ 7.3                  | Tachometer (A1p5)<br>LH-SFI Engines<br><br>HFM-SFI Engines | <p>N16/1<br/>W16  13</p> <p>N3/4<br/>W16  18<br/>(1)</p> | <p>Remove base module (N16/1) or engine control module (N3/4) (Figures 15, 16 and 17).<br/>Connect signal generator and set to a voltage amplitude of approx. 10 V (Figure 18)<br/>Ignition: <b>ON</b></p> | <p><b>Engine 119 LH-SFI</b><br/>70 Hz = 1000 rpm<br/>270 Hz = 4000 rpm</p> <p><b>Engine 104 HFM-SFI, Engine 120 LH-SFI</b><br/>50Hz = 1000 rpm<br/>194Hz = 4000 rpm</p>  | <p>Wiring,<br/>Electronic circuit board,<br/>Values OK on LH-SFI engines:<br/>N16/1,<br/>DM, Chassis and Drivetrain,<br/>Volume 1 – 1.1 23,<br/><br/>Values OK on HFM-SFI engines:<br/>N3/4.</p> |
| ⇒ 8.0                  | 5 <b>Low engine oil level indicator (A1e12)</b>            |  | <p>Oil level correct.<br/>Engine: <b>at Idle</b><br/>Activate test mode 5.</p>   | <p>Digital readout<br/><b>0.5</b> = oil level indicator lamp <b>OFF</b>, oil level correct.<br/><b>1.5</b> = oil level indicator lamp <b>ON</b>, oil level incorrect</p> | <p>Wiring,<br/>Oil level switch (S43).</p>   |



## Electrical Test Program – Test

| Test step<br>Test mode | Test scope                                | Test connection | Test condition  | Nominal value   | Possible cause/Remedy  |
|------------------------|---|-----------------|---|---|--|
| ⇒ 9.0                  | <b>Electronic speedometer (A1p8)</b>      |                 | Disconnect 6-pole connector X26/12 (Figure 11)<br>Ignition: <b>ON</b><br>Connect signal generator and set to a voltage amplitude of approx. 2 V.  | With increasing frequency the speed on the speedometer increases.   | Wiring,<br>Electronic circuit board, A1p8,<br>If speedometer is OK, vehicle speed sensor (L2).<br><br><b>Note:</b><br>If the electronic speedometer and the fuel consumption indicator are not operating, the vehicle speed signal is missing. |
| ⇒ 10.0                 | <b>Outside temperature display (A1p4)</b> |                 | Disconnect connector X67 (Figure 10)<br>Connect resistance substitution unit.<br>Ignition: <b>ON</b><br><b>Resistance substitution unit setting:</b><br><div style="text-align: right;">             53 kΩ<br/>             9.8 kΩ<br/>             1 kΩ           </div> | <b>Display in A1p4:</b><br><div style="text-align: right;">             = - 30 °C<br/>             = 0 °C<br/>             = + 50 °C           </div> | Wiring,<br>A1p4,<br>Electronic circuit board,<br>Values OK: outside temperature sensor (B14).  |

Electrical Test Program – Test

| Test step<br>Test mode | Test scope       | Test connection  | Test condition  | Nominal value  | Possible cause/Remedy               |
|------------------------|------------------|--|---|--|-------------------------------------|
| ⇒ 11.0                 | ECT gauge (A1p1) | W11—  B13 | Disconnect plug on ECT gauge sensor (B13).<br>Connect resistance substitution unit.<br>Ignition: <b>ON</b><br><b>Resistance substitution unit setting:</b><br><div>110 Ω = 60 °C<br/>67 Ω = 80 °C<br/>38 Ω = 100 °C<br/>20 Ω = 120 °C</div> | <b>Display in A1p1:</b><br><div>110 Ω = 60 °C<br/>67 Ω = 80 °C<br/>38 Ω = 100 °C<br/>20 Ω = 120 °C</div> | Wiring,<br>A1p1,<br>Values OK: B13. |

Electrical Test Program – Test

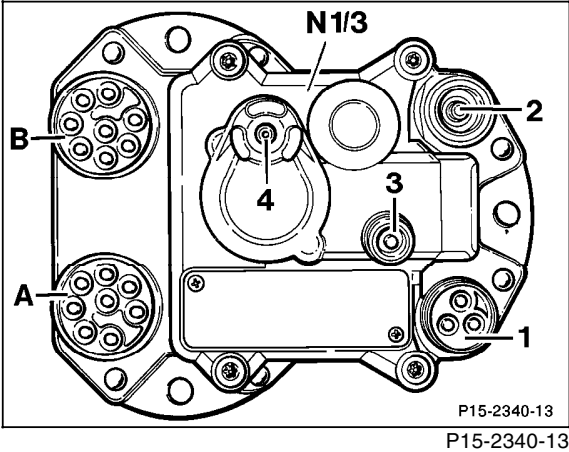


Figure 1

N1/3 Ignition control module

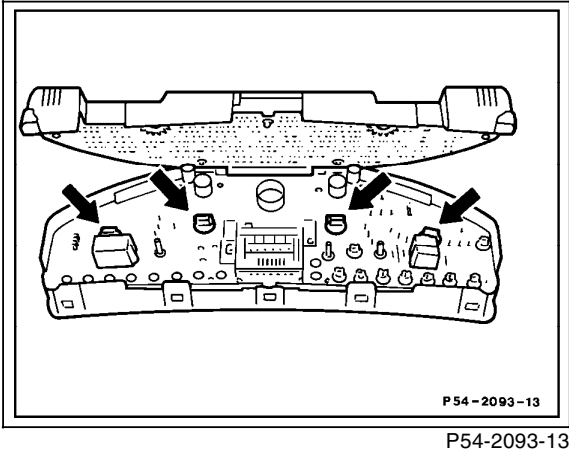


Figure 2

Instrument cluster illumination

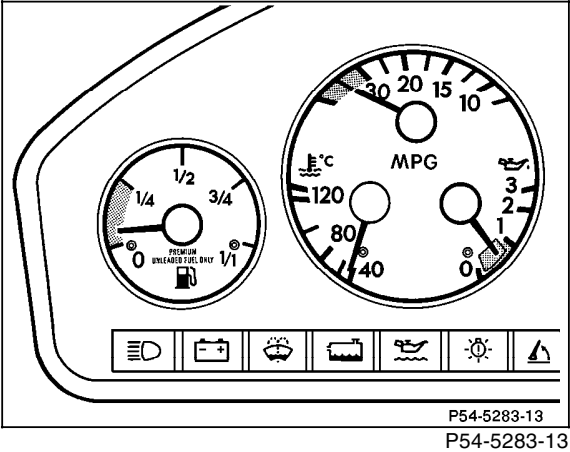


Figure 3

Activation of instruments  
1st quarter: Fuel tank  
Fuel consumption  
Oil pressure

Electrical Test Program – Test

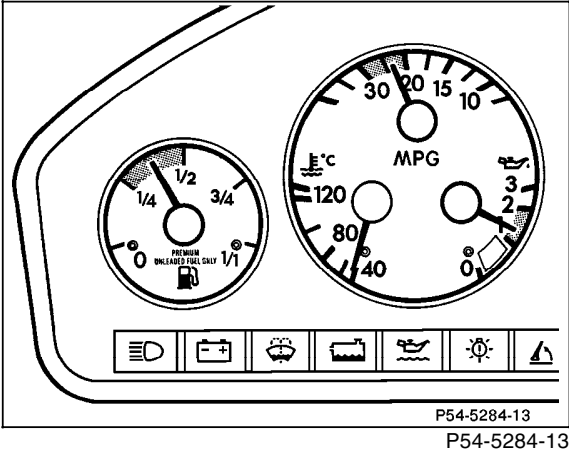


Figure 4

Activation of instruments  
2nd quarter: Fuel tank  
Fuel consumption  
Oil pressure

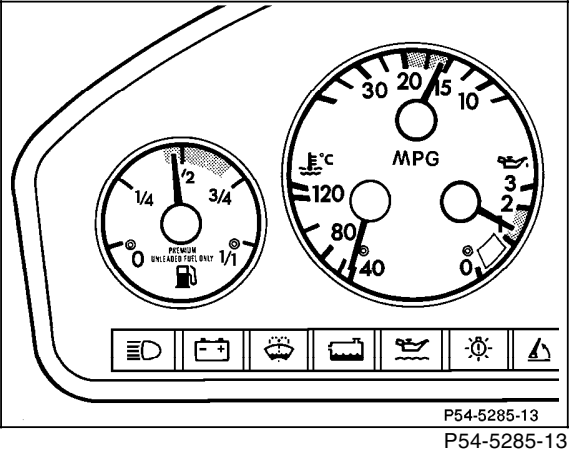


Figure 5

Activation of instruments  
2nd quarter: Oil pressure  
3rd quarter: Fuel tank  
Fuel consumption

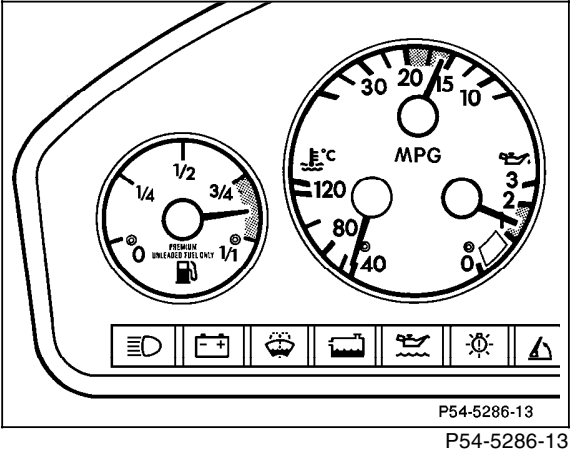


Figure 6

Activation of instruments  
2nd quarter: Oil pressure  
3rd quarter: Fuel consumption  
4th quarter: Fuel tank

Electrical Test Program – Test

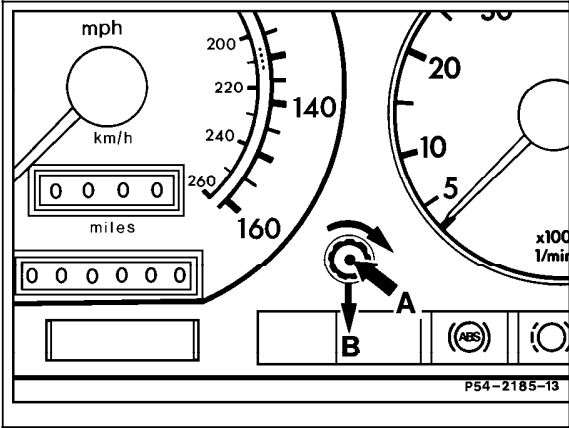


Figure 7

Activation of test mode

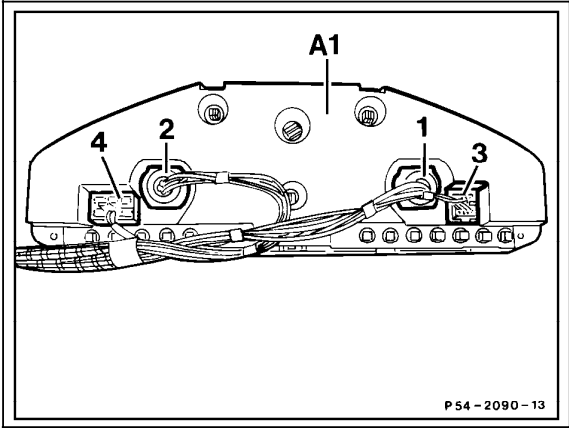


Figure 8

Instrument cluster, rear

Electrical Test Program – Test

Connection Diagram – Signal Generator  
CFI Engines

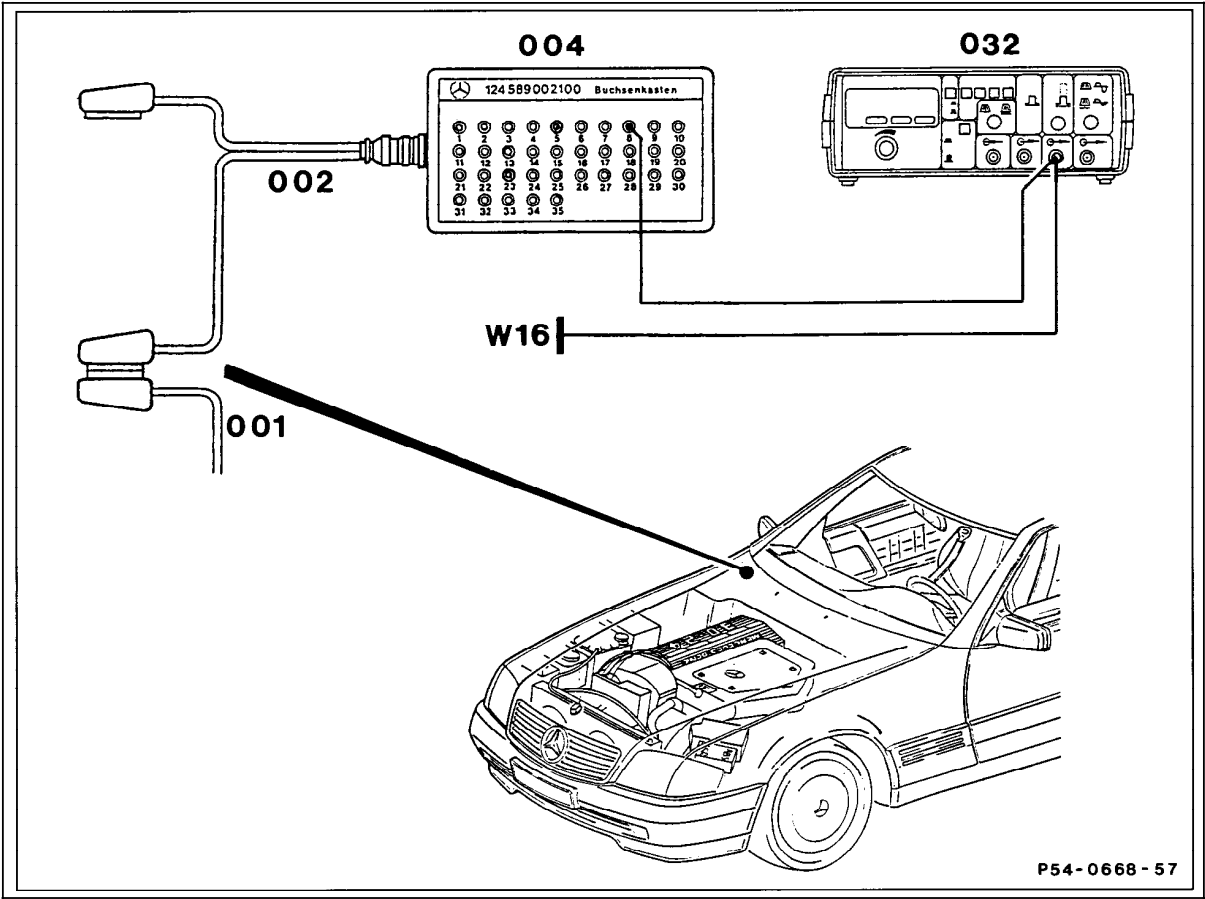


Figure 9

- 001 CFI control module connector
- 002 Test cable 104 589 00 63 00
- 004 Socket box
- 032 Signal generator
- W16 Ground (component compartment)

Electrical Test Program – Test

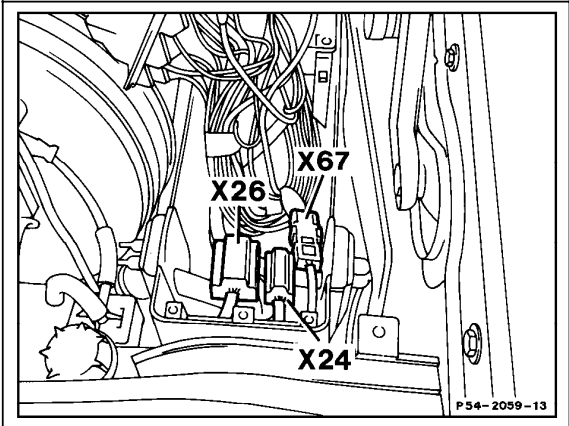


Figure 10

X67 Outside temperature indicator connector (2-pole)

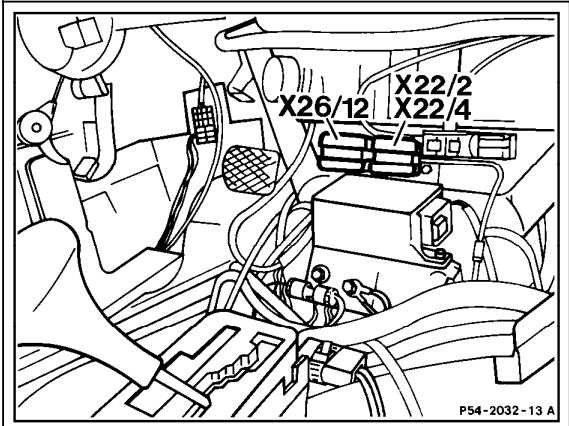


Figure 11

X26/12 Interior/transmission connector (6-pole)

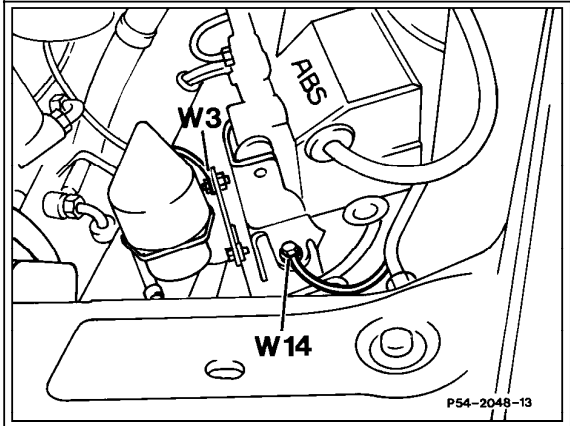


Figure 12

W3 Ground (left front wheelhousing at ignition coil)

Electrical Test Program – Test

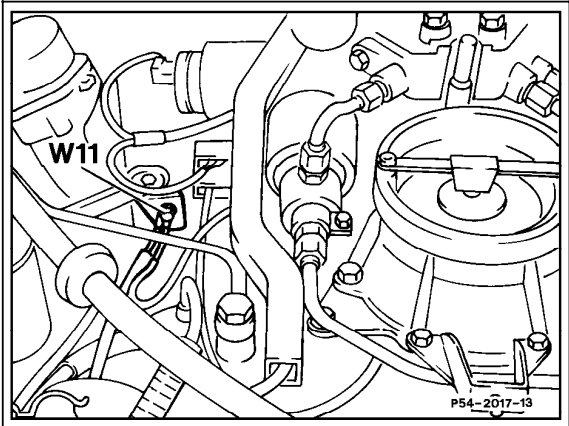


Figure 13

W11      Ground (engine - connection point for ground wires)

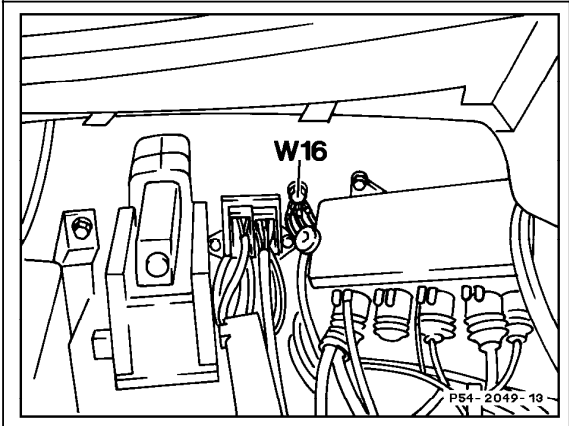


Figure 14

W16      Ground (component compartment)

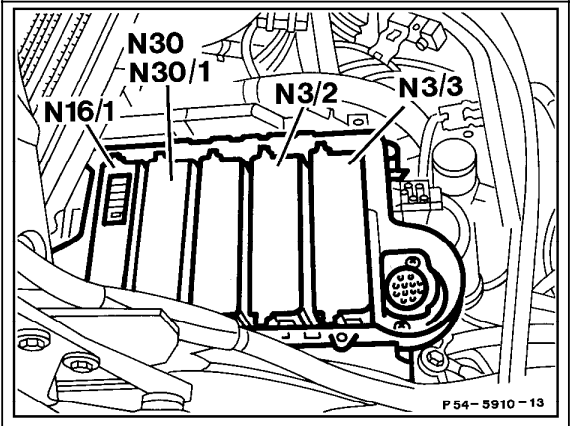
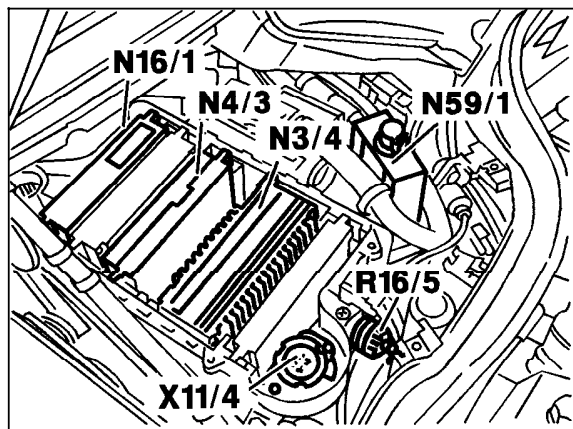


Figure 15  
Module box on vehicles with LH-SFI engine

- N16/1      Base module
- N3/2      Left LH-SFI control module
- N3/3      Right LH-SFI control module
- N30      ABS control module
- N30/1      ASR control module



### Electrical Test Program – Test



P07-6379-13

Figure 16  
Module box on vehicles with HFM-SFI engines

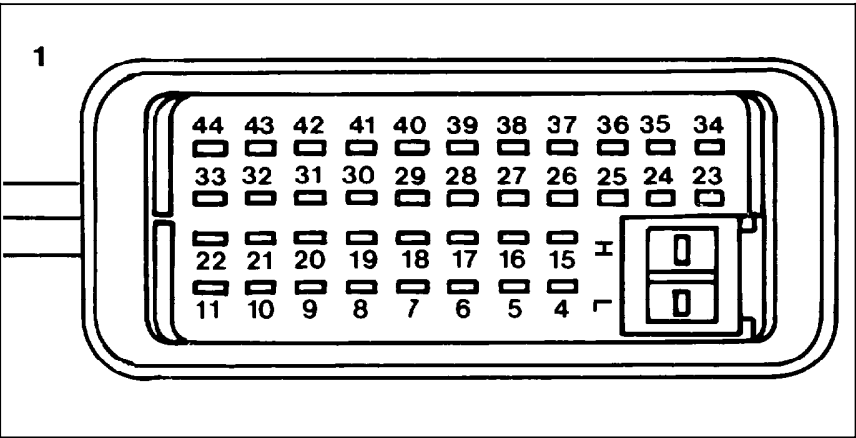
N3/4 Engine control module (HFM-SFI)

Electrical Test Program – Test

Figure 17

Engine control module (N3/4) connector “1”

- 7 Fuel consumption signal
- 18 Engine rpm output signal (TN-signal)



P07-5936-33

Electrical Test Program – Test

Connection Diagram – Signal Generator  
LH-SFI or HFM-SFI Engines

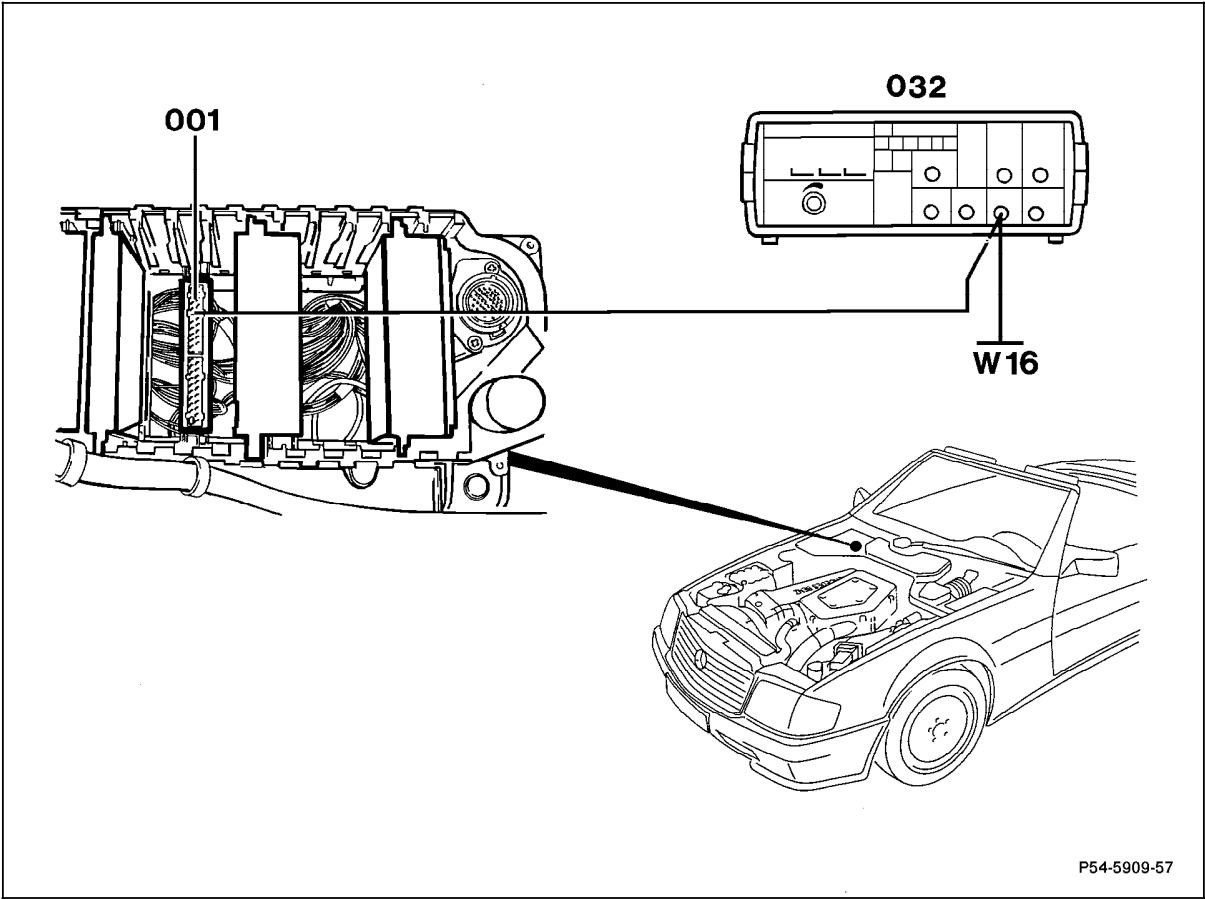


Figure 16

|     |                                |
|-----|--------------------------------|
| 001 | ABS control module connector   |
| 032 | Signal generator               |
| W16 | Ground (component compartment) |

P54-5909-57

P54-5909-57