Electrical Test Program – Test

Test step **Test mode**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0	**Instrument cluster (A1)** Voltage supply Circuit 30	A1 11 (2) — (V) — 12 (2)	Remove A1, Disconnect connector 2.	11 – 14 V	Wiring, ⇒ 1.1
⇒ 1.1	Voltage supply Circuit 15, unfused	A1 10 (1) — (V) — 1 (1)	Remove A1, Disconnect connector 1. Ignition: **ON**	11 – 14 V	Wiring, ⇒ 1.2
⇒ 1.2	Voltage supply Circuit 15, fused	A1 10 (1) — (V) — 5 (1)	Remove A1, Disconnect connector 1. Ignition: **ON**	11 – 14 V	Wiring, Values OK: Electronic circuit board.
⇒ 2.0	**Instrument cluster (A1)** Illumination	A1 10 (1) — (V) — 8 (1)	Remove A1, Disconnect connector 1. Ignition: **ON** Turn on parking lights.	11 – 14 V	Wiring, Exterior lamp switch (S1).
⇒ 3.0 **1**	**Fuel level gauge (A1p2)**		Activate test mode 1 (see Figure 1).	Analog fuel gauge reading digital readout	A1p2, ⇒ 3.1

Electrical Test Program – Test

Test step **Test mode**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 3.1 **6 – 9**	A1p2		Activate test modes 6 – 9.	Figures 2 – 5	A1p2, ⇒ 3.2
⇒ 3.2	Wires and connections or fuel level sensor (B4)	B4 1 —( )— 2	Ignition: **OFF** Disconnect connector at B4. Connect resistance substitution unit. Ignition: **ON** **Resistance substitution unit setting:** 70 ± 3 Ω 62 ± 1 Ω 53 ± 2 Ω 37 ± 2 Ω 21 ± 2 Ω 5 ± 2 Ω **Note:** Before changing each resistance value, the ignition must be turned off and then turned on again.	**Display in A1p2:** =0 [1] =Res. [1] =1/4 =1/2 =3/4 =1/1	Wrong reference resistor installed, check reference resistor, 23 (Figures 7 and 8), Wiring, Values OK: B4.

[1] Fuel reserve warning lamps light up.

Electrical Test Program – Test

Test step **Test mode**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 4.0 **2**	**Fuel consumption indicator (A1p10)**		Engine: **at idle** Activate test mode 2, increase rpm.	With increasing rpm the consumption in l/h increases. **Note:** The display can only be read on the digital display. The analog reading shows ∞.	⇒ 4.1.
⇒ 4.1 **6 – 8**			Activate test modes 6 – 8.	See Figures 2 – 5	A1p10, ⇒ 4.2.

Electrical Test Program – Test

Test step **Test mode**	Test Scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 4.2	Fuel consumption signal from: LH-SFI control module (N3/1, N3/3) or Engine control module (N3/4) or EDS control module (N39)	**LH-SFI control module** N3/1 or N3/3 W3/3 ◄–(G)+► 9 (1) **Engine control module** N3/4 W3/3 ◄–(G)+► 7 (1) **EDS control module** N39 W3/3 ◄–(G)+► 13 (1)	Ignition: **OFF** Remove N3/1, N3/3, N3/4 or N39 (Figure 9, 10, 14 and 15). Connect signal generator and set to a voltage amplitude of approx. 10 V (Figure 16). Ignition: **ON** Activate test mode 2.	**LH-SFI, HFM-SFI** 25 Hz= 5 l/h 50 Hz= 10 l/h 75 Hz= 15 l/h 100 Hz= 20 l/h **EDS** 50 Hz= 5 l/h 100 Hz= 10 l/h 150 Hz= 15 l/h 200 Hz= 20 l/h **Note:** The readout is only visible on the digital display. The analog reading shows ∞.	Wiring, Electronic circuit board, Values OK: N3/1, N3/3, N3/4 or N39 Engine Vol. 2 – 1.1 23 or – 3.1 23 or – 3.2 23. **Note:** If no plausible values are indicated while driving and the speedometer is functioning correctly, replace electronic circuit board.

Electrical Test Program - Test

Test step **Test mode**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 5.0 **3**	**Oil pressure gauge with warning lamp (A1p3)**		Engine: **at idle** Activate test mode 3 Increase engine rpm.	Oil pressure indicator Analog reading digital readout. The oil pressure increases with increasing engine rpm.	A1p3, ⇒ 5.1
⇒ 5.1 **6 – 7**			Activate diagnostic tests 6 – 7	See Figures 2 – 5	A1p3, Electronic circuit board, ⇒ 5.2
⇒ 5.2	Wires and connections or oil pressure sensor (B5)	B5 1 — 2	Disconnect connector at B5. Connect resistance substitution unit. Engine: **at idle** **Resistance substitution unit setting:** 13 Ω 40 Ω 90 Ω 150 Ω	**Display in A1p3:** = 0 = 1 = 2 = 3	Wiring, Electronic circuit board. Values OK: Check oil pressure (see SMS Engine, Mechanical), B5.

Electrical Test Program – Test

Test step / **Test mode**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 6.0	**Oil pressure gauge with warning lamp (A1p3)** Oil pressure warning lamp function	B5 1 —❨ ▦ ❩— 2	Check oil pressure. If oil pressure is OK, disconnect connector at B5. Connect resistance substitution unit. Start engine, increase engine speed > 1200 rpm. **Resistance substitution unit setting:** 13 Ω	**Display in A1p3:** =0 Oil pressure warning lamp lights up.	⇒ 5.2, Electronic circuit board.
⇒ 7.0 **4**	**Tachometer (A1p5)**	–	Engine: **at idle** Activate test mode 4. Raise engine speed.	Analog tachometer reading digital readout.	A1p5, Electronic circuit board, ⇒ 7.1

Electrical Test Program – Test

Test step **Test mode**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 7.1	A1p5 **at LH-SFI or diesel engine**	N16/1 W3/3 (G1) — 13 (1)	Remove N16/1 or N3/4 (Figures 9, 10, 14 and 15). Connect signal generator and set to a voltage amplitude of approx. 10 V (Figure 16). Ignition: **ON**	**Engine 104, 120** 50 Hz = 1000 rpm. 194 Hz = 4000 rpm. **Engine 119** 70 Hz = 1000 rpm. 270 Hz = 4000 rpm. **Engine 603** 2400 Hz = 1000 rpm. 9600 Hz = 4000 rpm.	Wiring, Electronic circuit board, Values OK on LH-SFI or diesel engine: N16/1 DM, Chassis and Drivetrain, Vol. 1 – 1.1 or 1.2 23.
	at HFM-SFI engine	N3/4 W3/3 (G1) — 18 (1)			Values OK on HFM-SFI engine: N3/4

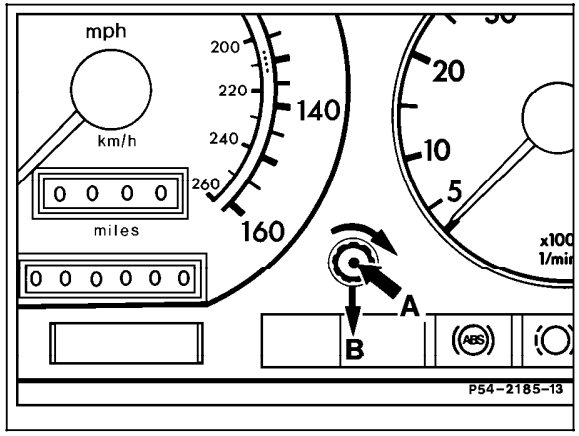
Electrical Test Program – Test

Test step / Test mode	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 8.0 **5**	**Low engine oil level indicator lamp (A1e12)**		Engine oil level OK (check with dipstick) Engine: **at idle** Activate test mode 5.	Digital readout 0.5 = oil level indicator lamp **OFF**, oil level correct. Digital readout 1.5 = oil level indicator lamp **ON**, oil level incorrect.	Wiring, Oil level switch (S43).
⇒ 9.0	**Electronic speedometer (A1p8)**	**ABS only** W3/3 ◄–(G)+► N30 ❩— 3 (1) **ASR (with ABS)** W3/3 ◄–(G)+► N30/1 ❩— 36 (1)	Remove N30 or N30/1, (Figure 9 and 10). Connect signal generator and set to a voltage amplitude of approx. 10 V (Figure 16). Ignition: **ON**	With increasing frequency the speed on the speedometer must increase.	Wiring, Electronic circuit board. Values OK: N30 or N30/1 DM, Chassis and Drivetrain, Vol. 2 – 6.2 23 or – 5.2 23.

Electrical Test Program – Test

Test step **Test mode**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 10.0	**Outside temperature display (A1p4)**	X24 9 —❨ ▦ ❩— 10	Disconnect headlamp harness connector (X24, Figure 11). Connect resistance substitution unit. Ignition: **ON** **Resistance substitution unit setting:** 53 kΩ 9.8 kΩ 1 kΩ	 **Display in A1p4:** = – 30°C = 0°C = + 50°C	Wiring, A1p4, Electronic circuit board. Values OK: Check outside temperature sensor (B14).
⇒ 11.0	**ECT gauge (A1p1)**	**Gasoline engine** B13 W11 —❨ ▦ ❩— **Diesel engine** B13 W11 —❨ ▦ ❩—	Disconnect plug at ECT gauge sensor (B13). Connect resistance substitution unit. Ignition: **ON** **Resistance substitution unit setting:** 110 Ω 67 Ω 38 Ω 20 Ω	 **Display in A1p1:** = 60 °C = 80 °C = 100 °C = 120 °C	Wiring, A1p1, Values OK: B13.

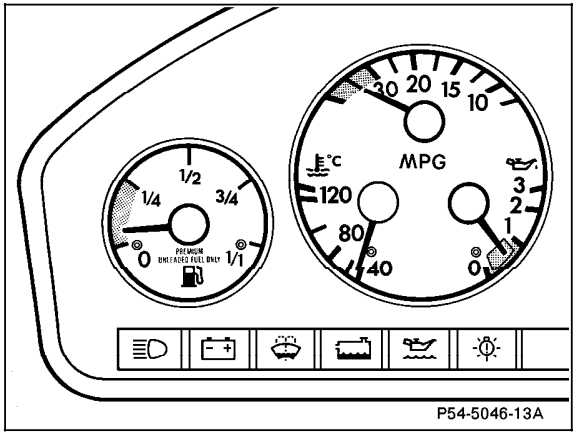
Electrical Test Program – Test



P54-2185-13

Figure 1

Activation of diagnostic code

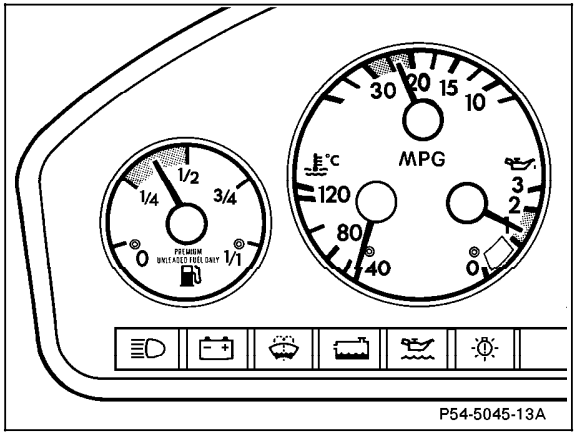


P54-5046-13A

Figure 2

Activation of instruments

1st quarter: Fuel tank
Fuel consumption
Oil pressure



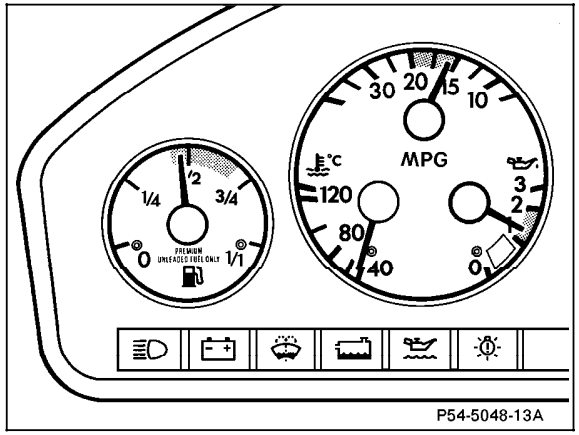
P54-5045-13A

Figure 3

Activation of instruments,

2nd quarter: Fuel tank
Fuel consumption
Oil pressure

Electrical Test Program – Test

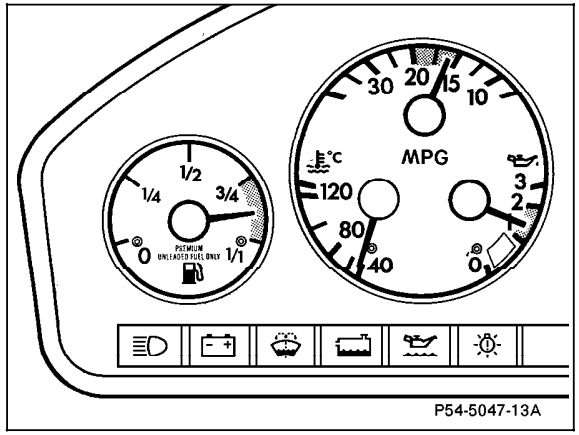


P54-5048-13A

Figure 4

Activation of instruments,

2nd quarter:	Oil pressure
3rd quarter:	Fuel tank
	Fuel consumption



P54-5047-13A

Figure 5

Activation of instruments,

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

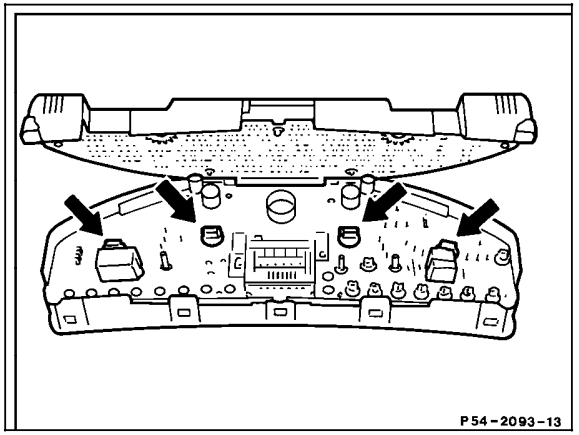


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Figure 6

Instrument cluster illumination

Electrical Test Program – Test

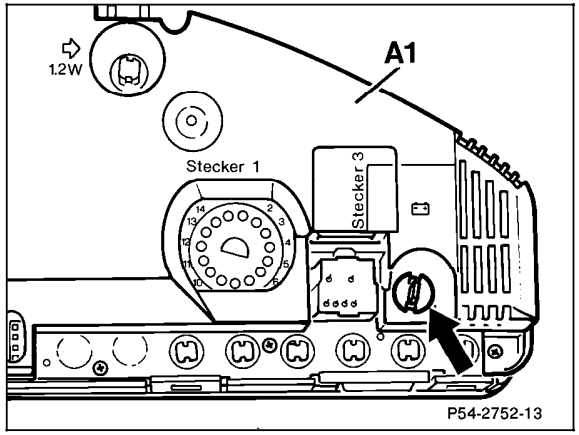

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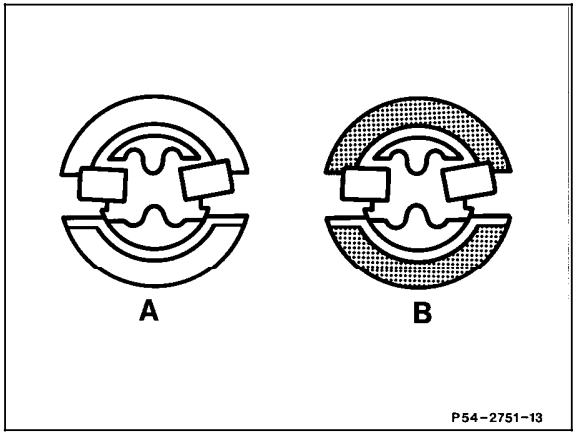
Figure 7

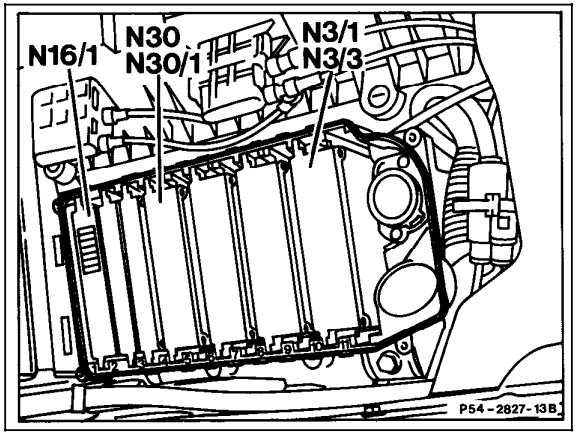
Fuel tank identification reference resistor



P54-2751-13

Figure 8

A	Reference resistor without contact rail for standard fuel tank
B	Reference resistor with contact rail for an optional European version fuel tank (not applicable for U.S. version vehicles).



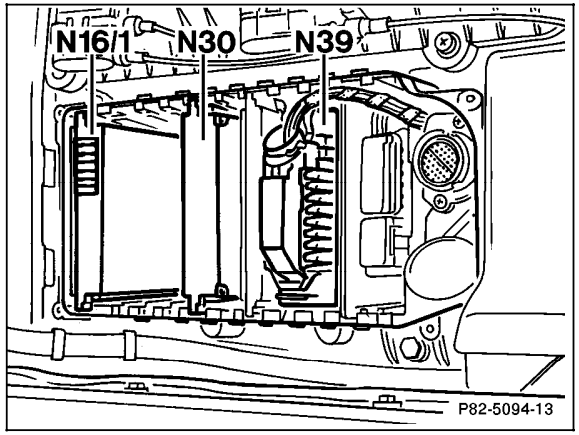
P54-2827-13B

Figure 9

Module box on vehicles with gasoline engine

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

Electrical Test Program – Test

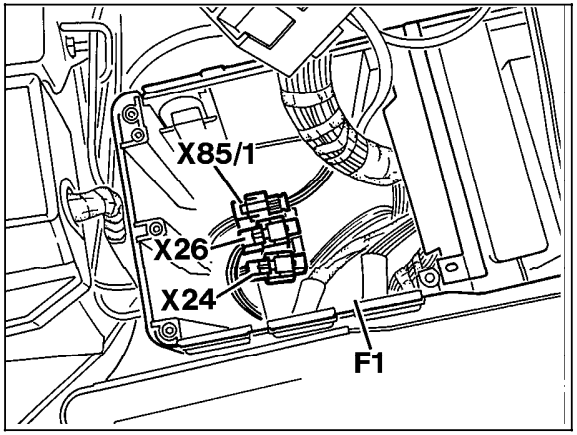


P82-5094-13

Figure 10

Module box on vehicles with diesel engine

N16/1 Base module
N30 ABS control module
N39 EDS control module



P54-2864-13

Figure 11

X24 Headlamp harness connector
F1 Main fuse box

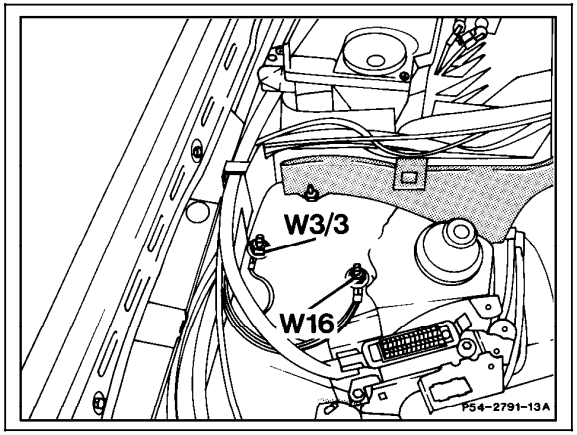


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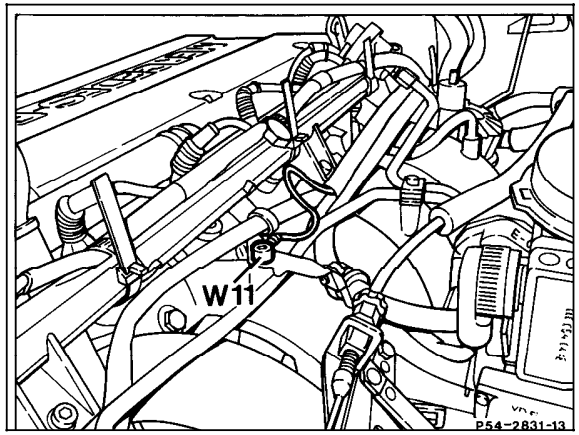
Figure 12

W3/3 Ground (right front wheel housing)

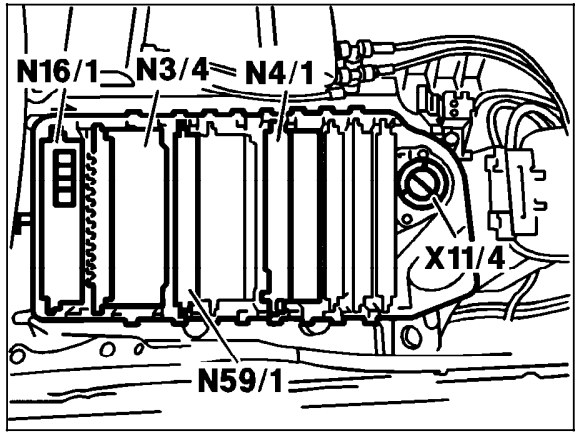
Electrical Test Program – Test



P54-2831-13

Figure 13

W11 Ground, engine (connection point for ground wires)



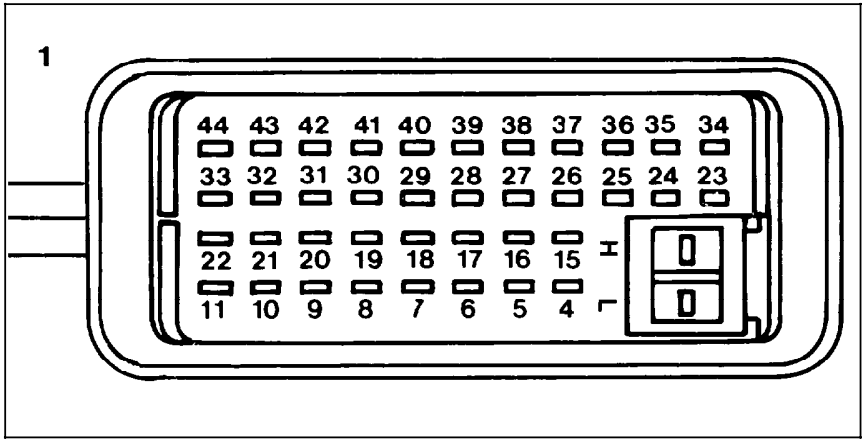
P07-5926-13

Figure 14

Module box on vehicles with HFM-SFI engine

N3/4 Engine control module (HFM-SFI)

Electrical Test program – Test



P07-5936-33

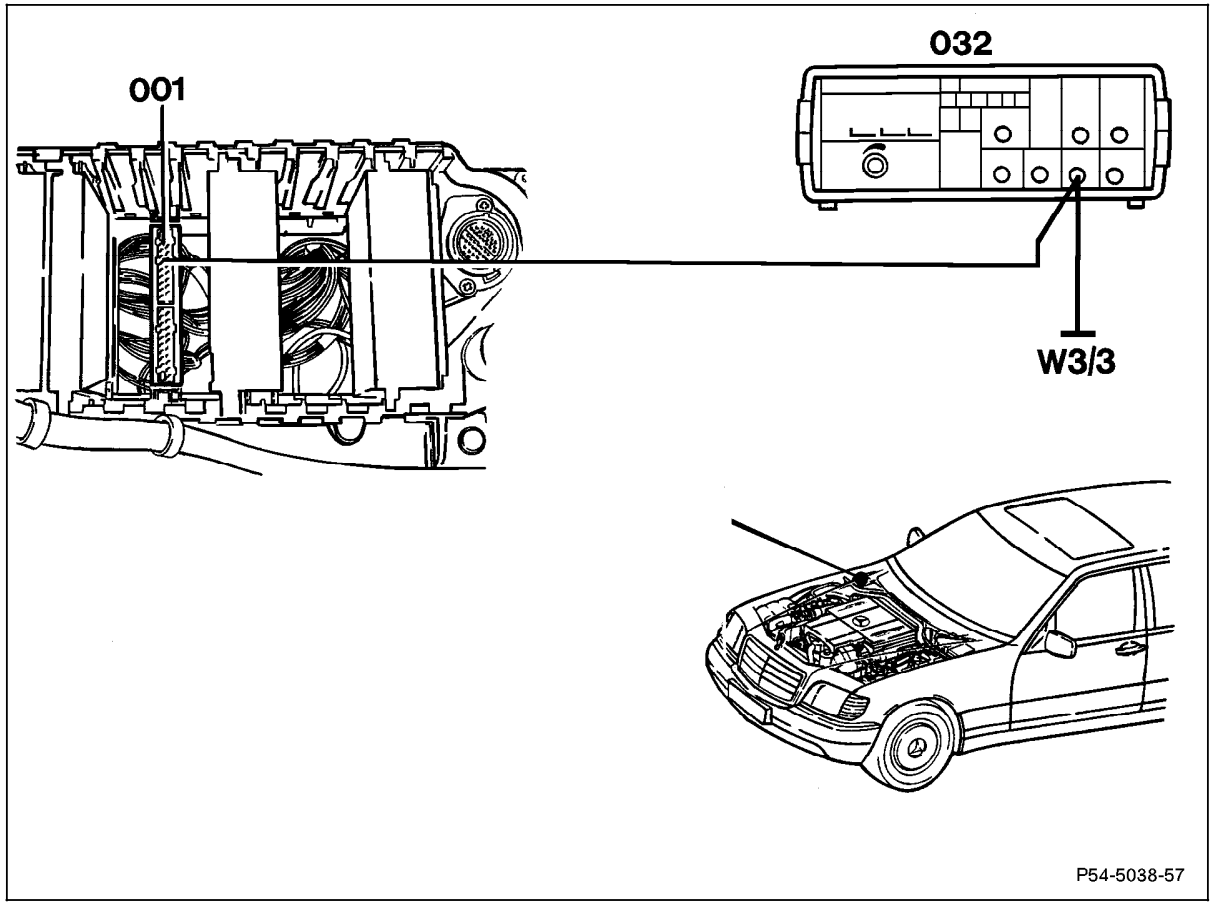
Figure 15

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

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

Electrical Test Program – Test

Connection Diagram – Signal Generator



P54-5038-57

Figure 16

001	ABS control module connector
032	Signal generator
W3/3	Ground (right front wheel housing - DI)