

7.1 Model 140

	Page
Diagnosis	
Diagnostic Trouble Code (DTC) Memory	11/1
Electrical Test Program	
Component Locations	21/1
Preparation for Test	22/1
Test	23/1

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Test Preparation for DTC Readout

1. Connect impulse counter scan tool or Hand-Held Tester to data link connector (X11/4) as shown in section 0.

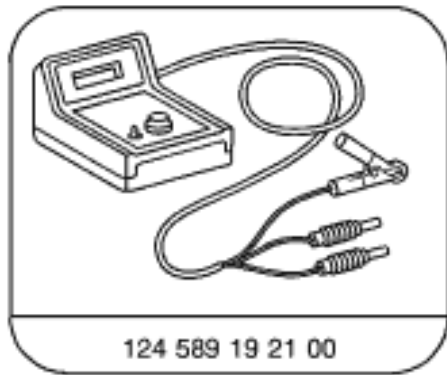
Note:

Connect yellow wire from impulse counter scan tool as follows:

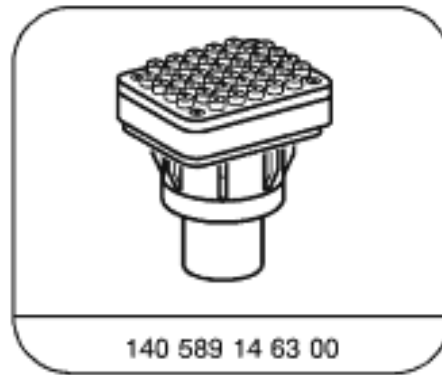
SPS control module (N49/1)	socket 12
Base module (N16/1)	socket 8

2. Ignition: **ON**.
3. Read DTC memory of SPS control module (N49/1), and base module (N16/1).

Special Tools



Impulse counter



Adapter



Equipment

Hand-Held Tester (HHT)

see applicable Service Information in groups 58 and 99

Diagnosis - Diagnostic Trouble Code (DTC) Memory



Model 140.0 (LH-SFI up 05/93), 140.1 (diesel)

Diagnostic trouble code (DTC)  	Possible cause	Test step/Remedy ¹⁾
1 -	No fault recognized. In case of complaint:	23 (entire test)
2 002	Speed-sensitive power steering control module (N49/1)	N49/1
3 003	Rear axle/left rear axle vehicle speed signal malfunction	23 ⇒ 7.0
4 004	Right rear axle vehicle speed signal malfunction	23 ⇒ 6.0
5 005	Comparison of left and right rear axle vehicle speed signals malfunctioning	23 ⇒ 7.0
6 006	Vehicle speed signal from axle missing	23 ⇒ 7.0
7 007	Vehicle speed signal from transmission missing	23 ⇒ 5.0
8 008	Short circuit between speed sensitive power steering P-valve (Y10) (+) and U _{BATT}	23 ⇒ 4.0
9 009	Speed-sensitive power steering P-valve (Y10), short circuit	23 ⇒ 4.0
10 010	Speed-sensitive power steering P-valve (Y10), open circuit	23 ⇒ 4.0
11 011	Voltage supply to speed-sensitive power steering control module (N49/1) insufficient voltage	23 ⇒ 1.0

¹⁾ Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Model 140.0 (HFM-SFI and LH-SFI as of 06/93)

Diagnostic trouble code (DTC)  	Possible cause	Test step/Remedy ¹⁾
1 -	No fault recognized. In case of complaint:	23 (entire test)
2 002	Speed-sensitive power steering control module (N49/1)	N49/1
3 003	Comparison of axle vehicle speed signal status/left front axle vehicle speed signal malfunctioning	23 ⇒ 7.0 23 ⇒ 8.0
4 004	Axle vehicle speed signal status missing	23 ⇒ 8.0
5 005	Speed-sensitive power steering control module (N49/1)	N49/1
6 006	Speed sensitive power steering P-valve (Y10); short circuit	23 ⇒ 4.0
7 007	Speed sensitive power steering P-valve (Y10); open circuit	23 ⇒ 4.0
8 008	Short circuit between speed sensitive power steering P-valve (Y10) (+) and U _{BATT}	23 ⇒ 1.0

1) Observe Preparation for Test, see 22.

Electrical Test Program - Component Locations

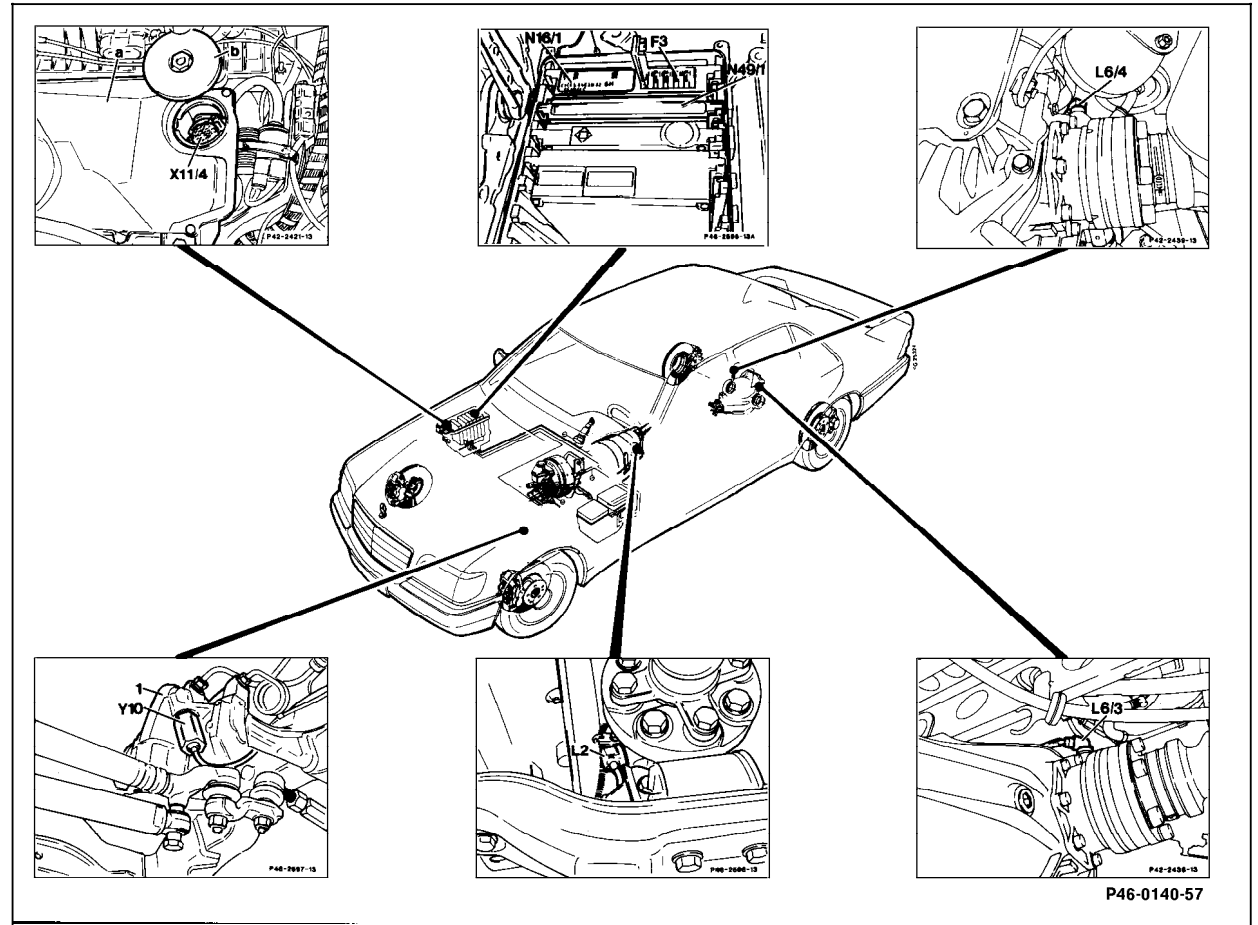
Model 140

Note:

For SPS control module (N49/1) layout on model 140 with engine 120 or California version engines 104/119, refer to 23, Figure 5.

Figure 1

- 1 Steering gear
- L2 **Model 140.0 (LH-SFI) up to 05/93 and 140.1 (diesel) up to 01/93**
Transmission inductive speed sensor
- L6 **Model 140 (LH-SFI) with ABS up to 05/93 1)**
Rear axle vehicle speed sensor (location, see 23, Figure 4)
- L6/3 **Model 140 (LH-SFI) with ASR up to 05/93 1)**
Left rear axle vehicle speed sensor
- L6/4 **Model 140 (LH-SFI) with ASR up to 05/93 1)**
Right rear axle vehicle speed sensor
- N16/1 Base module
- F3 Fuse box (35-fuse, in fuse and relay box F1)
- N49/1 SPS control module
- X11/4 Data link connector (38-pole)
- Y10 SPS P-valve



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1) As of 06/93, signal is obtained from ABS or ABS/ASR control module. Sensors remain installed.

Electrical Test Program - Preparation for Test

Preliminary work:

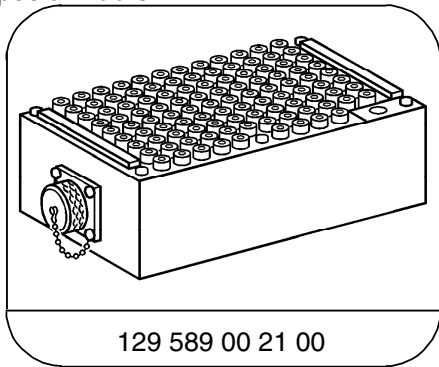
Diagnosis - Diagnostic Trouble Code (DTC) Memory 11

1. Ignition: **OFF**
2. Remove speed-sensitive steering control module (N49/1).
3. Connect socket box (126-pole) with contact module 4 and contact box according to connection diagram.

Wiring Diagrams

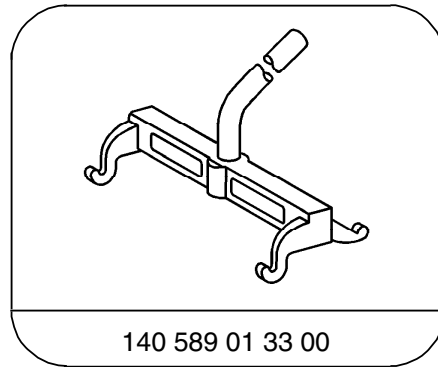
Electrical Troubleshooting Manual, Model 140.

Special Tools



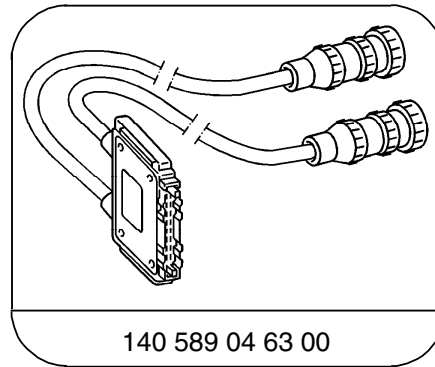
129 589 00 21 00

126-pin socket box



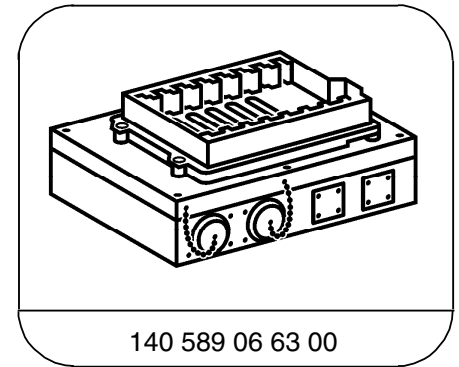
140 589 01 33 00

Mounting lever



140 589 04 63 00

Contacting module 4



140 589 06 63 00

Contacting box

Electrical Test Program - Preparation for Test

Special Tools



140 589 10 33 00

Spacer



201 589 00 99 00

Electrical connecting set

Equipment

Multimeter ¹⁾

Fluke models 23, 83, 85, 87

¹⁾ Available through the MBUSA Standard Equipment Program.

Electrical Test Program - Preparation for Test

Connection Diagram – Socket Box
 Model 140 Except with Engine 120 and
 California Version Engine 104/119

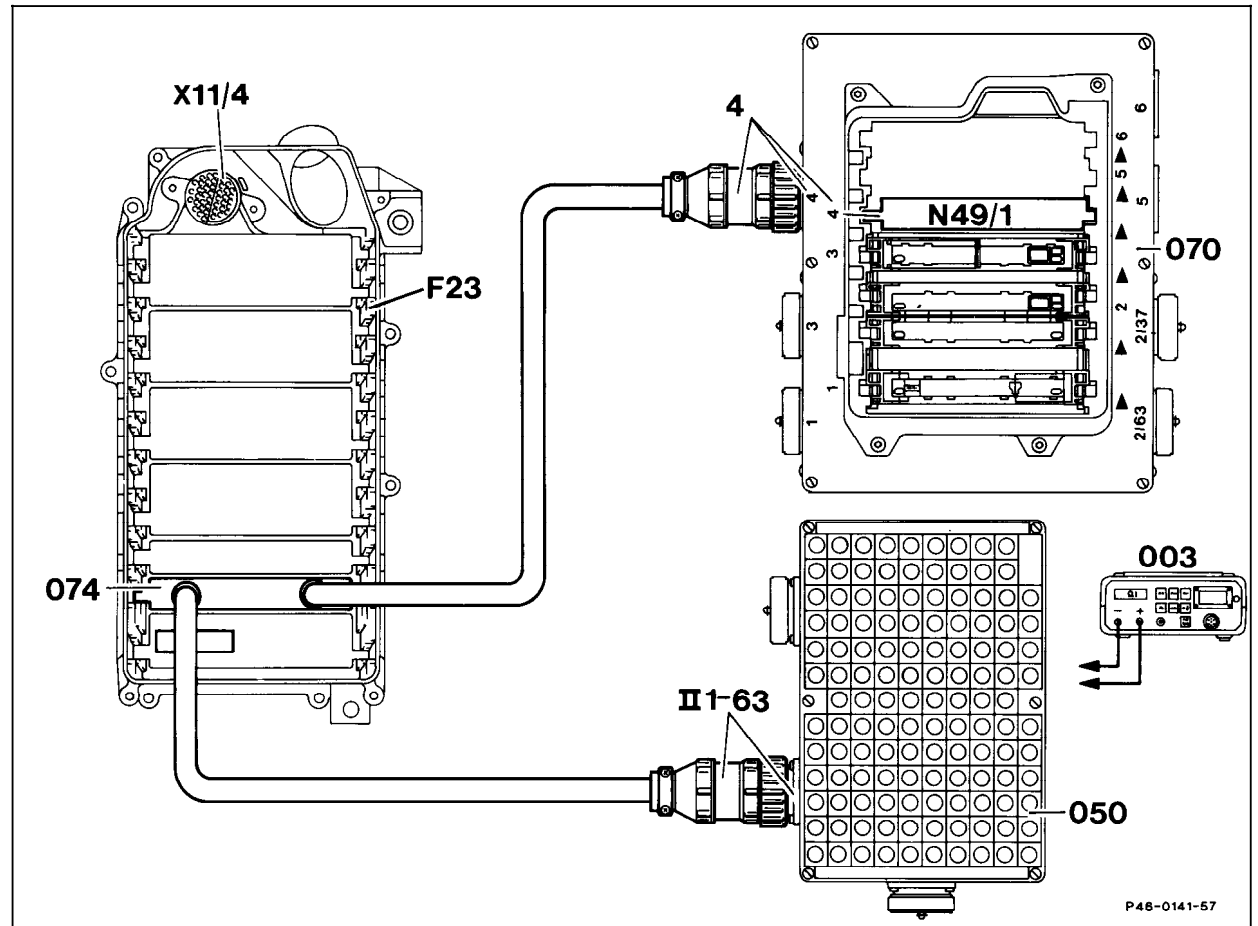


Figure 1

- 003 Multimeter
- 050 Socket box (126-pole)
- 070 Contact box
- 074 Contact module 4
- F23 Module box
- N49/1 SPS control module
- X11/4 Data link connector (38-pole)

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Electrical Test Program - Preparation for Test

Connection Diagram – Socket Box
Model 140 with Engine 120 and
California Version Engine 104/119

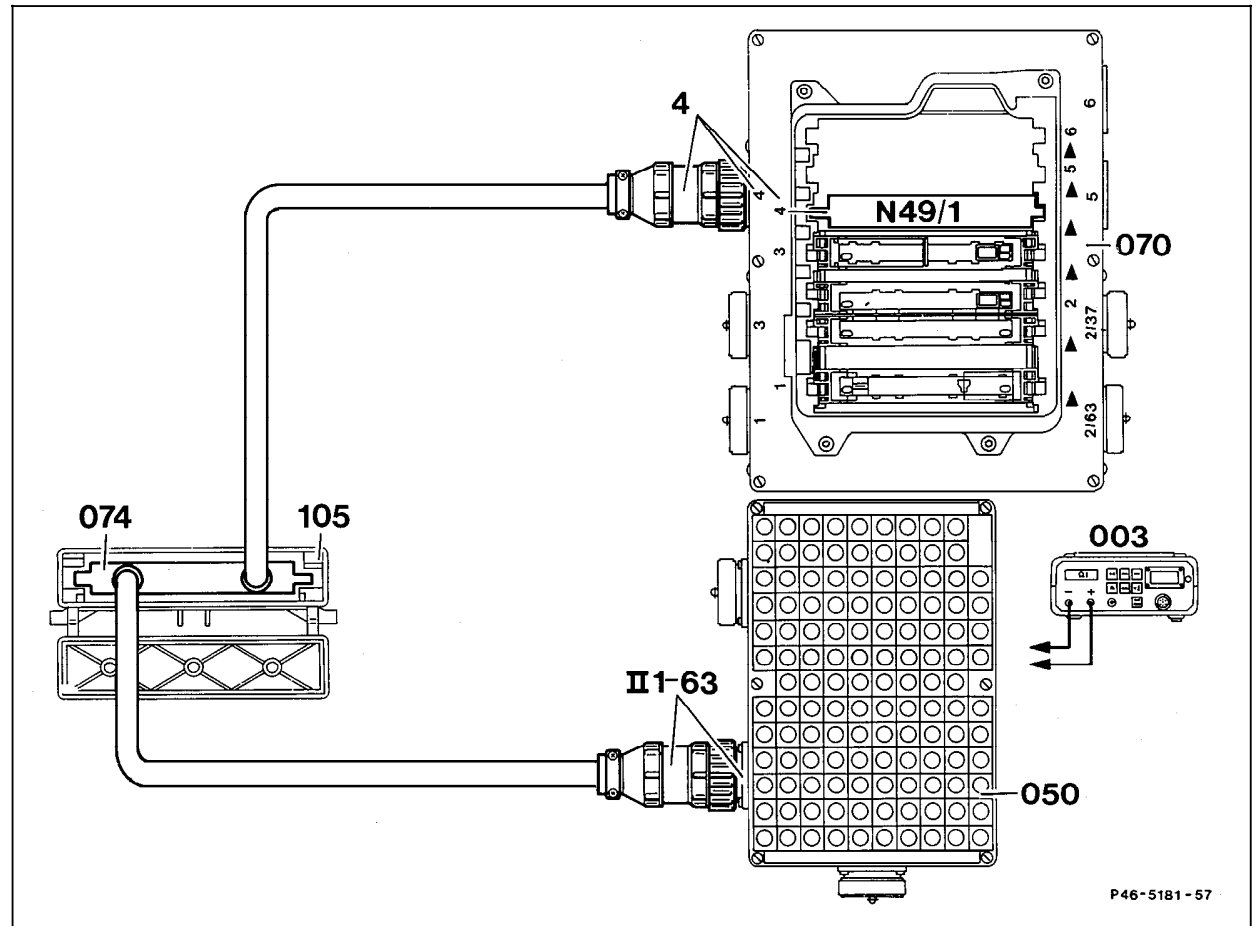



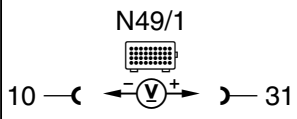
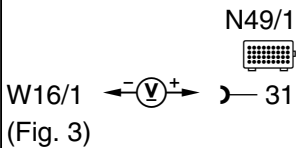
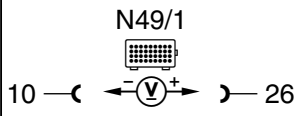
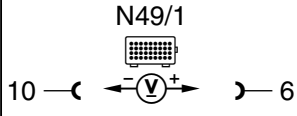
Figure 2

- 003 Multimeter
- 050 Socket box (126-pole)
- 070 Contact box
- 074 Contact module 4
- 105 SPS control module housing
- N49/1 SPS control module
- X11/4 Data link connector (38-pole)












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Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0	 SPS control module (N49/1) Voltage supply Circuit 87 SA		Ignition: ON	11 – 14 V	⇒ 1.1, Ground, electronics output ground (W15) or ground (right rear seat) (W17) with N49/1 under rear seat.
⇒ 1.1	Voltage supply from Base module (N16/1)		Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Fuse (F3) at base module BM, N16/1, Volume 1, 1.1 or 1.2 23, respectively, Wiring.
⇒ 2.0	Diagnostic output		Ignition: ON	10 – 14 V	Wiring, SPS control module (N49/1).
⇒ 3.0 (Models 140.0 [up to 05/93], and 140.1 [diesel up to 01/93])	Circuit 61 voltage		Ignition: ON Engine: Start	< 1 V 11 – 14 V	Wiring, Generator (G2).


Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 4.0	     Speed-sensitive power steering P-valve (Y10) Voltage supply	N49/1  19 —(← ⊖ ⊕ →)— 18	Engine: Start	5 – 7 V	⇒ 4.1, SPS control module (N49/1).
⇒ 4.1	Coil resistance	N49/1  19 —(← ⊖ ⊕ →)— 18	Ignition: OFF Pull SPS control module (N49/1) out of contact box.	3 – 5 Ω	Wiring, SPS P-valve (Y10).
⇒ 5.0 (Models 140.0 up to 05/93, and 140.1 up to 01/93)	 Transmission inductive speed sensor (L2)	N49/1  8 —(← ⊖ ⊕ →)— 9	Ignition: OFF Pull SPS control module (N49/1) out of contact box.	1.6 – 2.1 k Ω	Wiring, L2, SPS control module (N49/1).
⇒ 6.0 (Model 140.0 up to 05/93 with ASR only)	 Vehicle speed sensor output Right rear from ABS/ASR control module (N30/1)	N49/1  10 —(← ⊖ ⊕ →)— 7	Lift rear of vehicle Ignition: ON Turn right rear wheel approx. 1 revolution/second.	> 3 V	Wiring, Volume 1, 5.2 23 ASR, SPS control module (N49/1).

Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 7.0	Models 140.0 up to 05/93, 140.1 up to 01/93 Rear axle vehicle speed sensor output ABS center from ABS control module (N30) or ABS/ASR left rear from ABS/ASR control module (N30/1)		Lift rear of vehicle. Ignition: ON Turn right rear wheel approx. 1 revolution/second.	> 3 V	Wiring, Volume 1, 5.2 23 ASR, Volume 1, 6.2 23 ABS, SPS control module (N49/1).
	Model 140.0 LH-SFI starting 06/93, HFM-SFI, 140.1 starting 02/93 Left front axle vehicle speed sensor output from ABS control module (N30) or ABS/ASR control module (N30/1)		Lift rear of vehicle. Ignition: ON Turn right rear wheel approx. 1 revolution/second.	> 3 V	

Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 8.0 (Model 140.0 LH-SFI starting 06/93, HFM- SFI, 140.1 starting 02/93)	Vehicle speed sensor status from ABS control module (N30) or ABS/ASR control module (N30/1)	 <p>N49/1</p>	Ignition: ON	> 3 V	Wiring, Volume 1, 5.2 23 ASR, Volume 1, 6.2 23 ABS, SPS control module (N49/1).

Electrical Test Program - Test

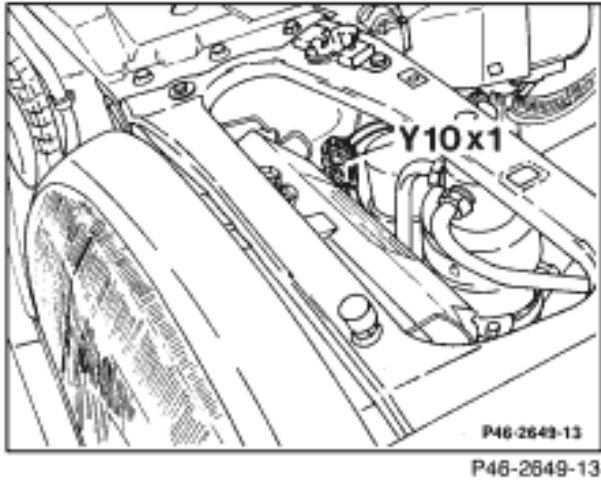


Figure 1

Y10x1 SPS P-valve connector

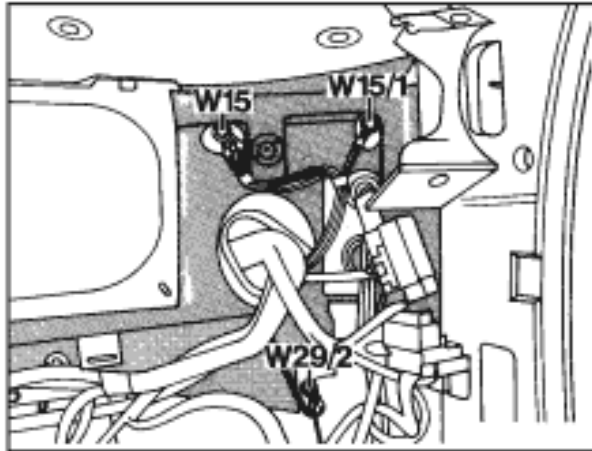


Figure 2

W15 Ground (electronics output ground - right footwell)

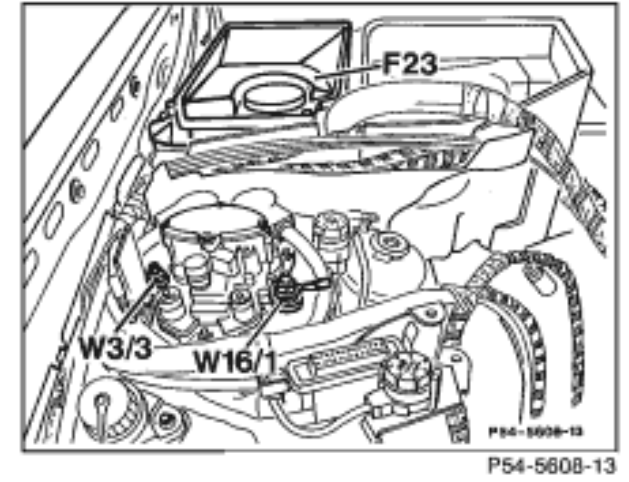


Figure 3

W16/1 Ground (right front spring tower)

Electrical Test Program - Test

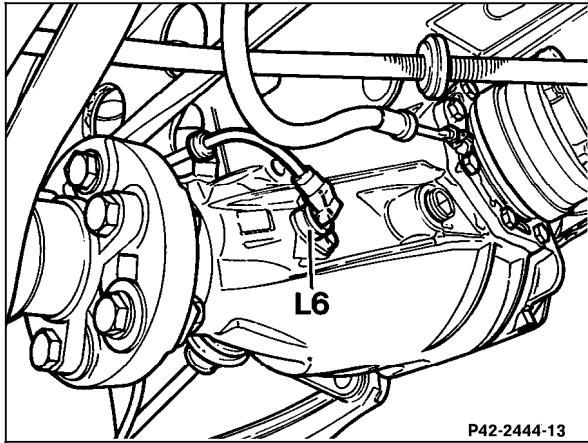


Figure 4

L6 Rear axle vehicle speed sensor (only on vehicles without ASR)

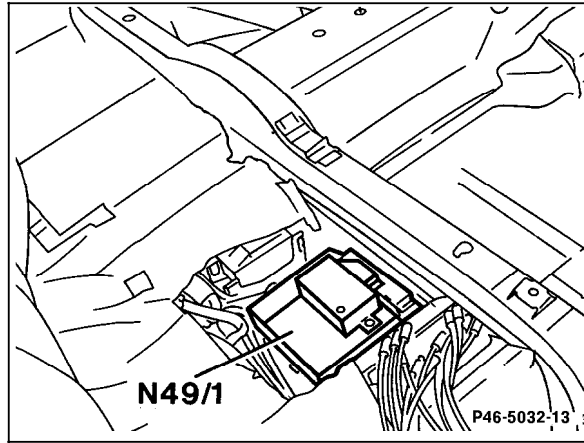


Figure 5

Model 140.057 and California Engines 104/119
N49/1 SPS control module

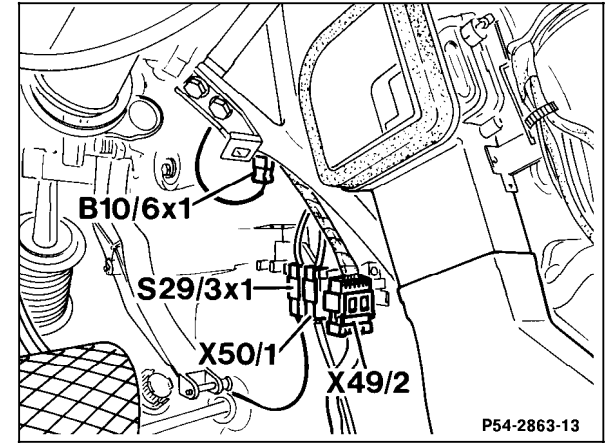
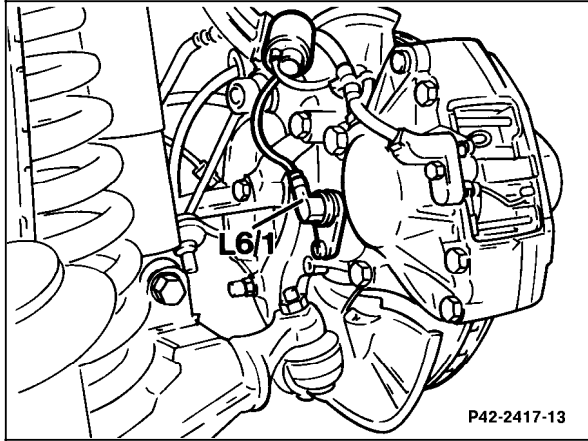


Figure 6

X49/2 Backup lamp/starter lock-out switch connector

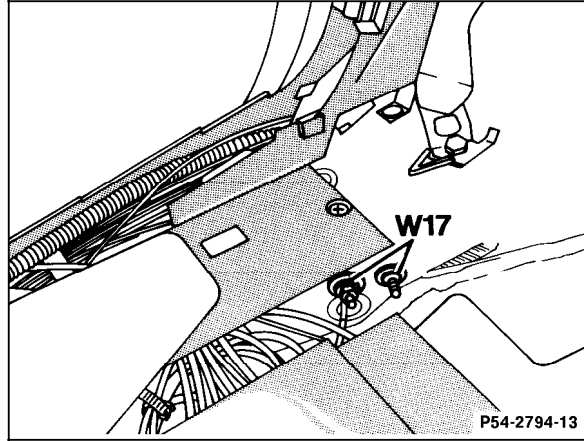
Electrical Test Program - Test



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Figure 7

L6/1 Left front axle vehicle speed sensor



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Figure 8

Model 140.057 and California Engines 104/119

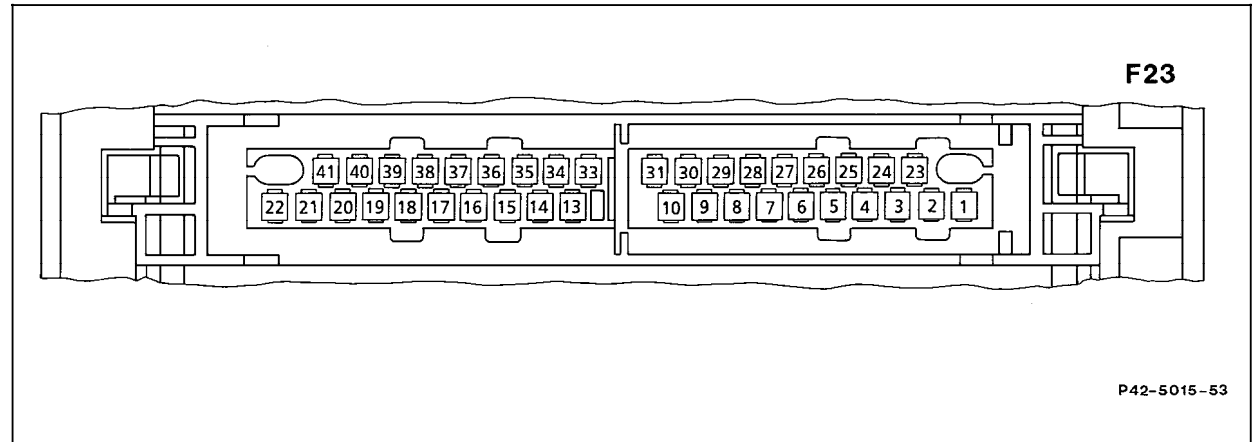
W17 Ground (right rear seat)

Electrical Test Program - Test

Layout of connector for SPS control module (N49/1)

Figure 9

- F23 Module box
- 1-5 Not used
- 6 **Model 140.0 (LH-SFI up to 05/93) and 140.1 (diesel up to 01/93):** circuit 61
Model 140.0 (LH-SFI starting 06/93, HFM-SFI, 140.1 starting 02/93): Vehicle speed signal status from ABS control module (N30) or ABS/ASR control module (N30/1)
- 7 **Model 140.0 (LH-SFI up to 05/93) with ASR:** Right rear axle vehicle speed signal output from ABS/ASR control module (N30/1)
- 8 **Models 140.0 (LH-SFI up to 05/93) and 140.1 (diesel up to 01/93):** Transmission inductive speed sensor (L2) (-)
- 9 **Models 140.0 (LH-SFI up to 05/93) and 140.1 (diesel up to 01/93):** Transmission inductive speed sensor (L2) (+)
- 10 Ground (electronics output ground - right footwell) (W15) or ground (right rear seat) (W17) with control module under rear seat
- 11-17 Not used
- 18 SPS P-valve (Y10) (+)
- 19 SPS P-valve (Y10) (-)
- 20-25 Not used
- 26 Diagnosis output
- 27-29 Not used



- 30 **Model 140.0 (LH-SFI up to 05/93) with ASR:** Left rear axle vehicle speed sensor output from ABS/ASR control module (N30/1)
Model 140.0 (LH-SFI up to 05/93) and 140.1 (diesel up to 01/93) with ABS only: Rear axle vehicle speed sensor output from ABS control module (N30)
Model 140.0 (LH-SFI starting 06/93, HFM-SFI) and 140.1 starting 02/93: Left front axle vehicle speed sensor output from ABS control module (N30) or ABS/ASR control module (N30/1)
- 31 Voltage supply circuit 87 SA from base module (N16/1)
- 33-41 Not used