5.2 Models 124.034/036, 129.063/067/076, 140

Diagnosis - Function Test

Test step/Test sequence	Test condition	Nominal value	Possible cause/Remedy [1]
⇒ 1.0 Brake torque control circuit	Lift rear of vehicle so both rear wheels of vehicle can move freely.Secure vehicle properly. Engine: **at Idle** TR “D“ Accelerator pedal at WOT ⚠ If ASR does not engage, accelerator pedal in CTP (release accelerator pedal)	The rear wheels are noticeably braked, simultaneously the ABS/ASR hydraulic unit high-pressure/return pump can be heard. Engine speed is reduced to 1000 rpm.	23, 33, DM, Engines, Vol. 3, section 6.2 – 6.4.

[1] Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Preparation for DTC Readout

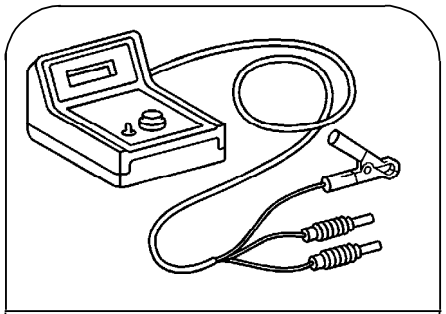
1. Connect impulse counter scan tool or Hand-Held Tester (HHT) to data link connector (X11/4) according to connection diagram (see section 0).

   Note:
   Connect yellow wire from impulse counter scan tool to:

ABS/ASR control module (N30/1)	socket 6
BM (N16/1)	socket 8
SPS control module (N49/1)	socket 12
ADS control module (N51)	socket 11
TCM (N15/1)	socket 10
EA/CC/ISC control module (N4/1)	socket 7
Engine (N3/4), LH-SFI (N3/1) or Right LH-SFI control module (N3/3)	socket 4
Left LH-SFI control module (N3/2)	socket 5
DI (N1/3) or Right DI control module (N1/5)	socket 17
Left DI control module (N1/4)	socket 18

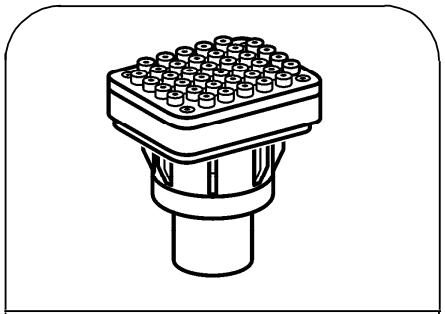
2. Ignition: **ON**
3. Read out DTC's for control modules listed.

Special Tools



124 589 19 21 00

Pulse counter



140 589 14 63 00

Adapter

Equipment

Hand-Held Tester (HHT)	See S.I. in groups 58 and 99.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Diagnostic trouble code (DTC)  	Possible cause	Test step/Remedy [1]
1 –	No fault in system.	In case of complaint: 23 and 33 (entire test)
2 002	Left front axle VSS sensor (L6/1), open circuit	23⇒ 14.0
3 003	Right front axle VSS sensor (L6/2), open circuit	23⇒ 16.0
4 004	Left rear axle VSS sensor (L6/3), open circuit	23⇒ 18.0
5 005	Right rear axle VSS sensor (L6/4), open circuit	23⇒ 20.0
6 006	ABS/ASR hydraulic unit, left front axle solenoid valve (A7/3y1)	23⇒ 23.0
7 007	ABS/ASR hydraulic unit, right front axle solenoid valve (A7/3y2)	23⇒ 24.0
8 008	ABS/ASR hydraulic unit, left rear axle solenoid valve (A7/3y3)	23⇒ 25.0
9 009	ABS/ASR hydraulic unit, right rear axle solenoid valve (A7/3y4)	23⇒ 26.0
10 010	ABS/ASR hydraulic unit, high-pressure/return pump relay (A7/3k2), ABS/ASR hydraulic unit, high-pressure/return pump (A7/3m1)	23⇒ 8.0 23⇒ 2.0
11 011	ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1)	23⇒ 7.0
Models 124.036 (02/92 →), 129.076, 140.04/05/07 12 012	Master brake cylinder switchover valve (Y61)	23⇒ 9.0
13 013	Stop lamp switch (S9/1)	23⇒ 10.0

[1] Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Diagnostic trouble code (DTC)  	Possible cause	Test step/Remedy [1]
Model 124.036 (02/93 →), 129.076, 140.04/04/07		
14 014	ABS lateral acceleration sensor (B24/2), open circuit	23⇒ 13.0
15 015	ABS/ASR control module (N30/1)	Replace N30/1
16 016	Vehicle speed signal (VSS) (L6/1, L6/2, L6/3, L6/4), implausible [2] [3]	23⇒ 14.0 23⇒ 16.0 23⇒ 18.0 23⇒ 20.0 Visually inspect
17 017	Battery voltage too low	23⇒ 1.0
20 020	ABS/ASR hydraulic unit, switchover/solenoid valve (A7/3y5)	23⇒ 27.0
21 021	ABS/ASR hydraulic unit, pressure switch (A7/3s1), charge	23⇒ 1.0, 2.0 23⇒ 22.0
22 022	ABS/ASR hydraulic unit, pressure switch (A7/3s1), leakage	23⇒ 1.0, 2.0 23⇒ 22.0
23 023	ABS/ASR hydraulic unit, pressure switch (A7/3s1), hydraulic	23⇒ 1.0, 2.0 23⇒ 22.0

1) Observe Preparation for Test, see 22.

2) Rotor with incorrect tooth count, dirt accumulation on or damaged rotor, incorrect rear axle ratio, wrong wheel or tire size.

3) If DTC appears only after repair work, it was caused by applying the brakes or driving vehicle on a dynamometer, erase DTC.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Diagnostic trouble code (DTC)		Possible cause	Test step/Remedy [1]
24	024	ASR charging pump (M15)	Wiring, 33⇒ 1.0, 2.0
25	025	Left front axle VSS sensor (L6/1), implausible [2]	23⇒ 14.0 Visually inspect.
26	026	Right front axle VSS sensor (L6/2), implausible [2]	23⇒ 16.0 Visually inspect.
27	027	Left rear axle VSS sensor (L6/3), implausible [2]	23⇒ 18.0 Visually inspect.
28	028	Right rear axle VSS sensor (L6/4), implausible [2]	23⇒ 20.0 Visually inspect.
Model 124.036 (02/93 →), 129.076, 140.04/04/07 29	029	ABS lateral acceleration sensor (B24/2), implausible	23⇒ 13.0
30	030	CAN data bus to EA/CC/ISC control module (N4/1), interrupted	23⇒ 28.0 Read out DTC for N4/1: see DM, Engines, Vol. 2, sections 6.2 or 6.3 11

1) Observe Preparation for Test, see 22.

2) Rotor with incorrect tooth count, dirt accumulation on or damaged rotor, incorrect rear axle ratio, wrong wheel or tire size.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Diagnostic trouble code (DTC)		Possible cause	Test step/Remedy [1]
31	031	CAN data bus to LH-SFI control module (N3/1), Left LH-SFI control module (N3/2), Right LH-SFI control module (N3/3), or Engine control module (N 3/4), interrupted	23⇒ 28.0 Read out DTC for N3/1, N3/2, N3/3, N3/4: see DM, Engines, Vol. 2, sections 1.1, 3.1 or 3.2 11
32	032	CAN data bus to DI control module (N1/3), Left DI control module (N1/4), Right DI control module (N1/5), interrupted	23⇒ 28.0 Read out DTC for N1/3, N1/4, N1/5: see DM, Engines, Vol. 2 sections 5.2 or 5.3 11
33	033	CAN data bus, interrupted	23⇒ 28.0 Read out DTC for N4/1: see DM, Engines, Vol. 2, sections 6.2 or 6.3 11 Read out DTC for N1/3, N1/4, N1/5: see DM, Engines, Vol. 2 sections 5.2 or 5.3 11 Read out DTC for N3/1, N3/2, N3/3, N3/4: see DM, Engines, Vol. 2, sections 1.1, 3.1 or 3.2 11 Read out DTC for N15/1: see DM, Chassis & Drivetrain, Vol. 1 section 2.2 12

[1] Observe Preparation for Test, see 22.

Diagnosis - Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Test step/Remedy [1]
ASR MIL (A1e22) or ABS MIL (A1e17) comes on while engine is running		12, Base module 1.1 11
ASR MIL (A1e22) or ABS MIL (A1e17) comes on while driving and stays on		12
ASR MIL (A1e22) or ABS MIL (A1e17) intermittently comes on while driving	Voltage supply less than 11 V, too many electrical consumers on	Test generator (G2), 12
ABS MIL (A1e17) does not come on with Ignition: **ON**		23 ⇒ 2.0
ASR MIL (A1e22) does not come on with Ignition: **ON**		23 ⇒ 3.0
ASR MIL (A1e22) comes on while engine is running, DTC 21 in memory		Hydraulic Test 33 ⇒ 1.0, 2.0 23 ⇒ 2.0
ABS MIL (A1e17) comes on while engine is running, after applying brakes or on a dynamometer	VSS implausible due to different VSS from front and rear axle	12

[1] Observe Preparation for Test, see 22.

Electrical Test Program - Component Locations

Electrical Components on Front Axle and in Engine Compartment

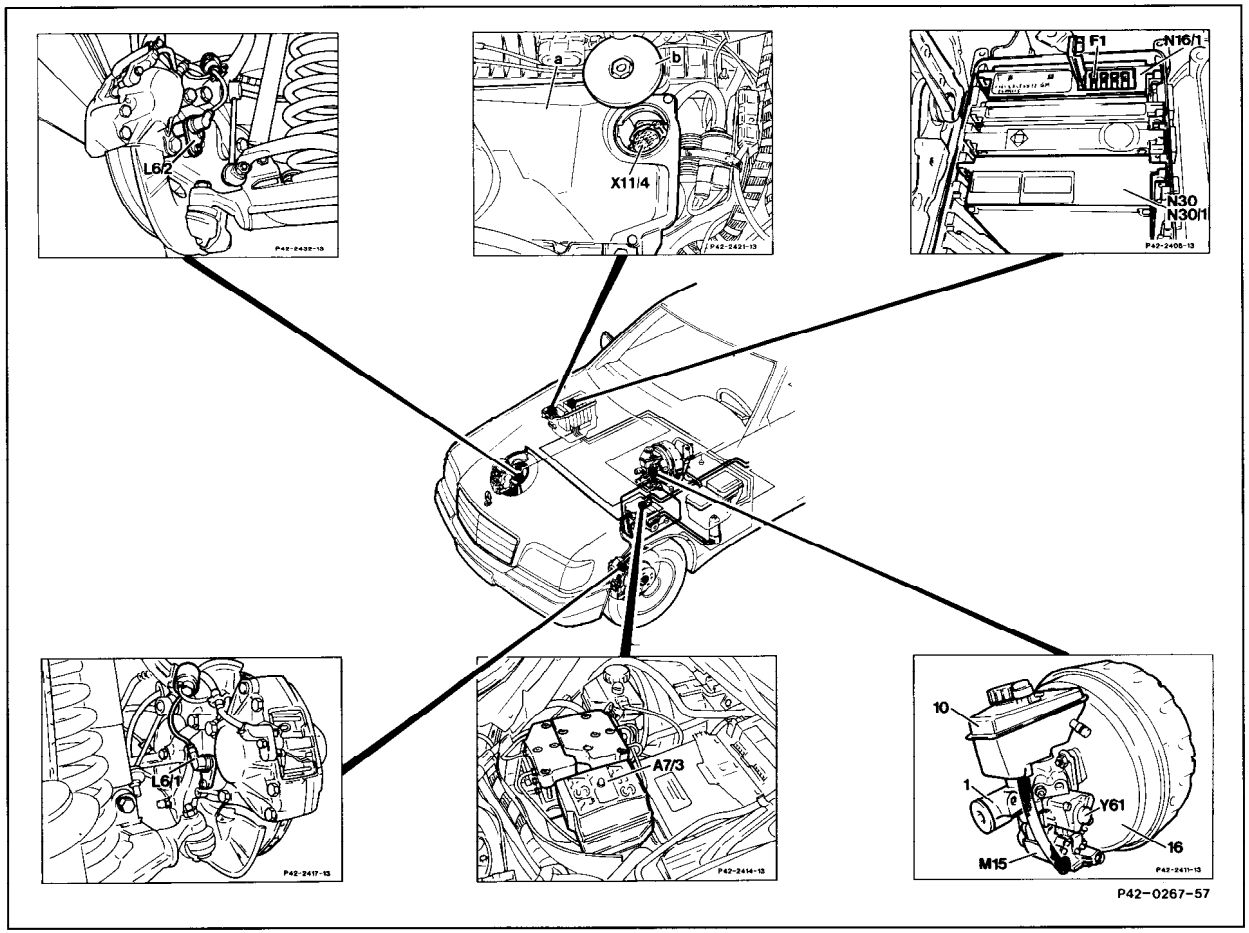


Figure 1

A7/3	ABS/ASR hydraulic unit
L6/1	Left front axle VSS sensor
L6/2	Right front axle VSS sensor
M15	ASR charging pump
N16/1	Base module (BM)
N30/1	ABS/ASR control module
X11/4	Data link connector (DTC readout)
Y61	Master brake cylinder switchover valve

P42-0267-57

Electrical Test Program - Component Locations

Electrical Components on the Rear Axle and in Passenger Compartment

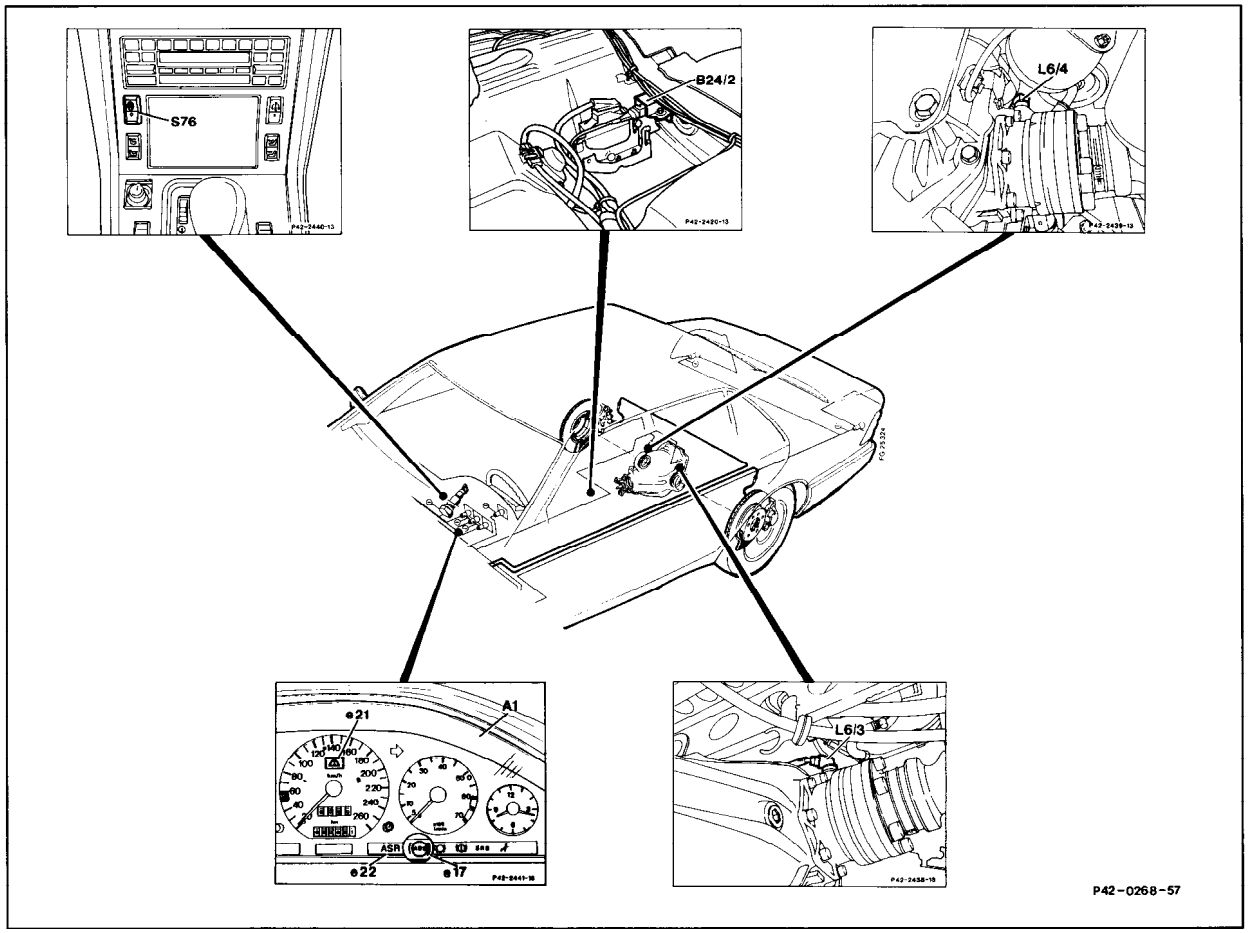


Figure 2

A1	Instrument cluster
A1e17	ABS MIL
A1e21	ASR warning lamp
A1e22	ASR MIL
B24/2	ASR lateral acceleration sensor
L6/3	Left rear axle VSS sensor
L6/4	Right rear axle VSS sensor

P42-0268-57

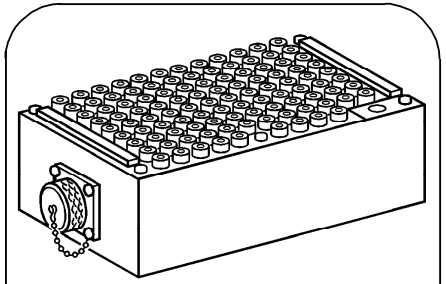
Electrical Test Program - Preparation for Test

1. Ignition: **OFF**
2. Disconnect ABS/ASR control module (N30/1).
3. Connect socket box (050) with contact module 2 (072) and contact box (070) according to connection diagram.

Electrical wiring diagrams :

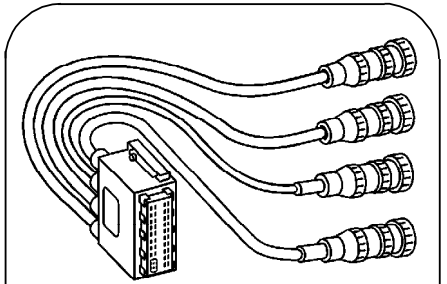
Electrical Troubleshooting Manual, Model 124
Electrical Troubleshooting Manual, Model 129
Electrical Troubleshooting Manual, Model 140.

Special Tools



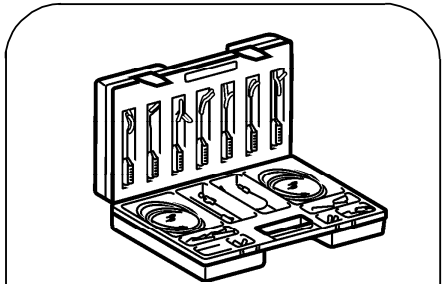
129 589 00 21 00

126-pin socket box



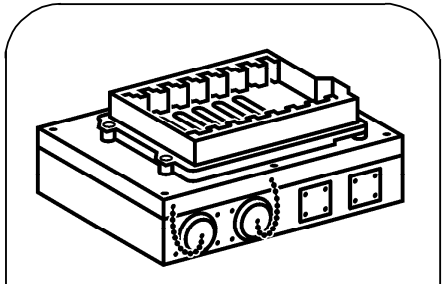
140 589 02 63 00

Contacting module 2



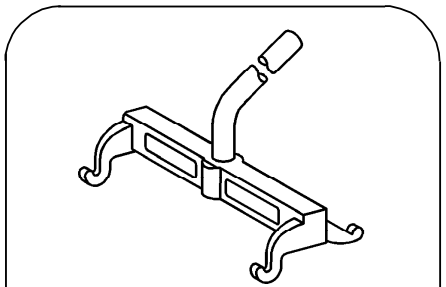
201 589 00 99 00

Electrical connecting set



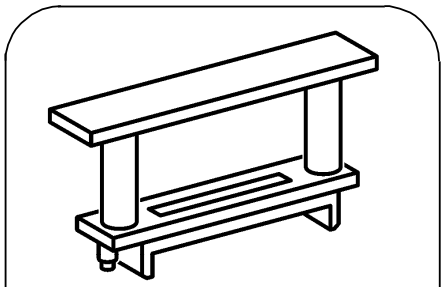
140 589 06 63 00

Contacting box



140 589 01 33 00

Mounting lever



140 589 10 33 00

Spacer

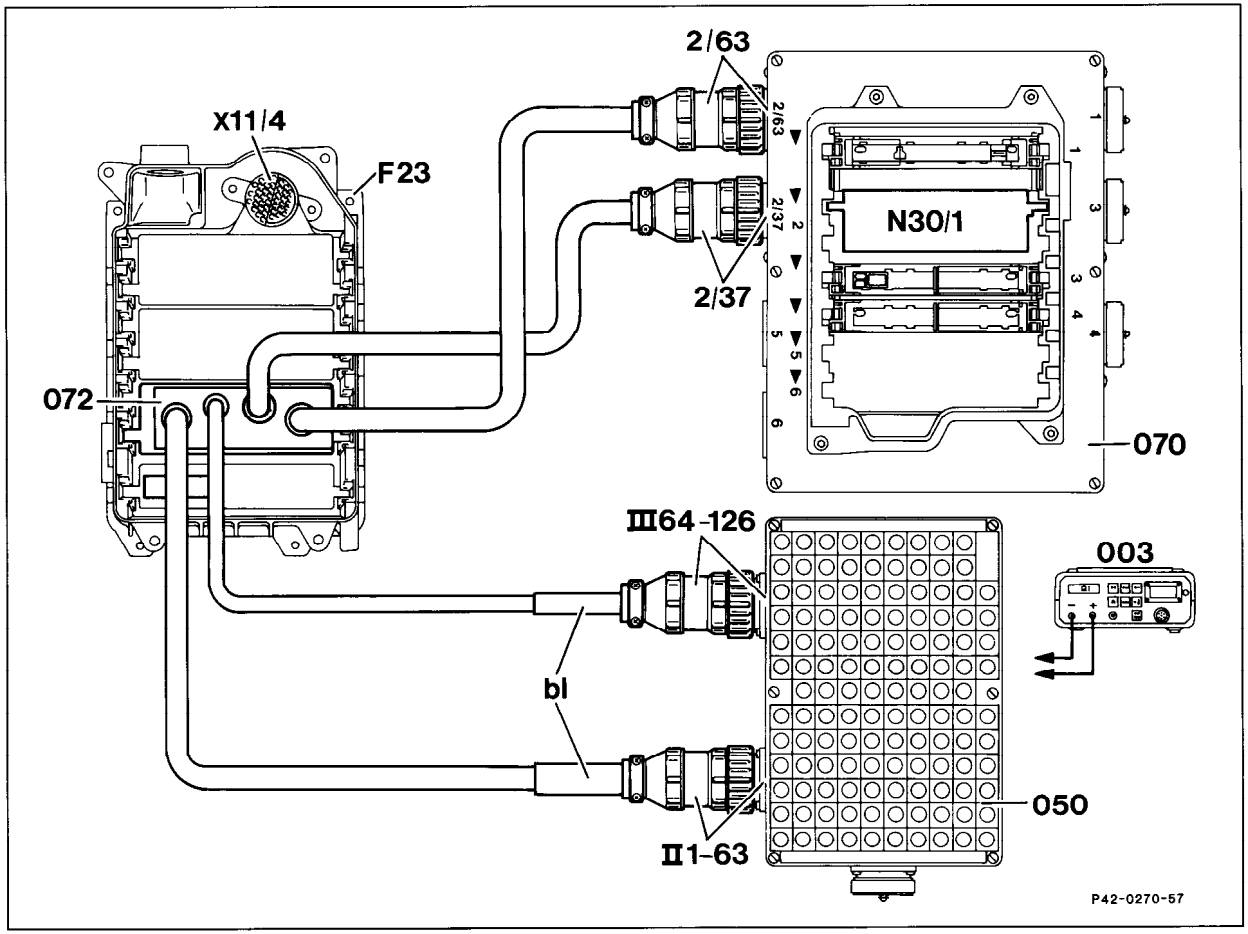
Equipment

Digital multimeter [1]	Fluke model 23, 83, 85, 87

[1] Available through the MBUSA Standard Equipment Program.

Electrical Test Program - Preparation for Test

Connection Diagram - Socket Box
Model 124



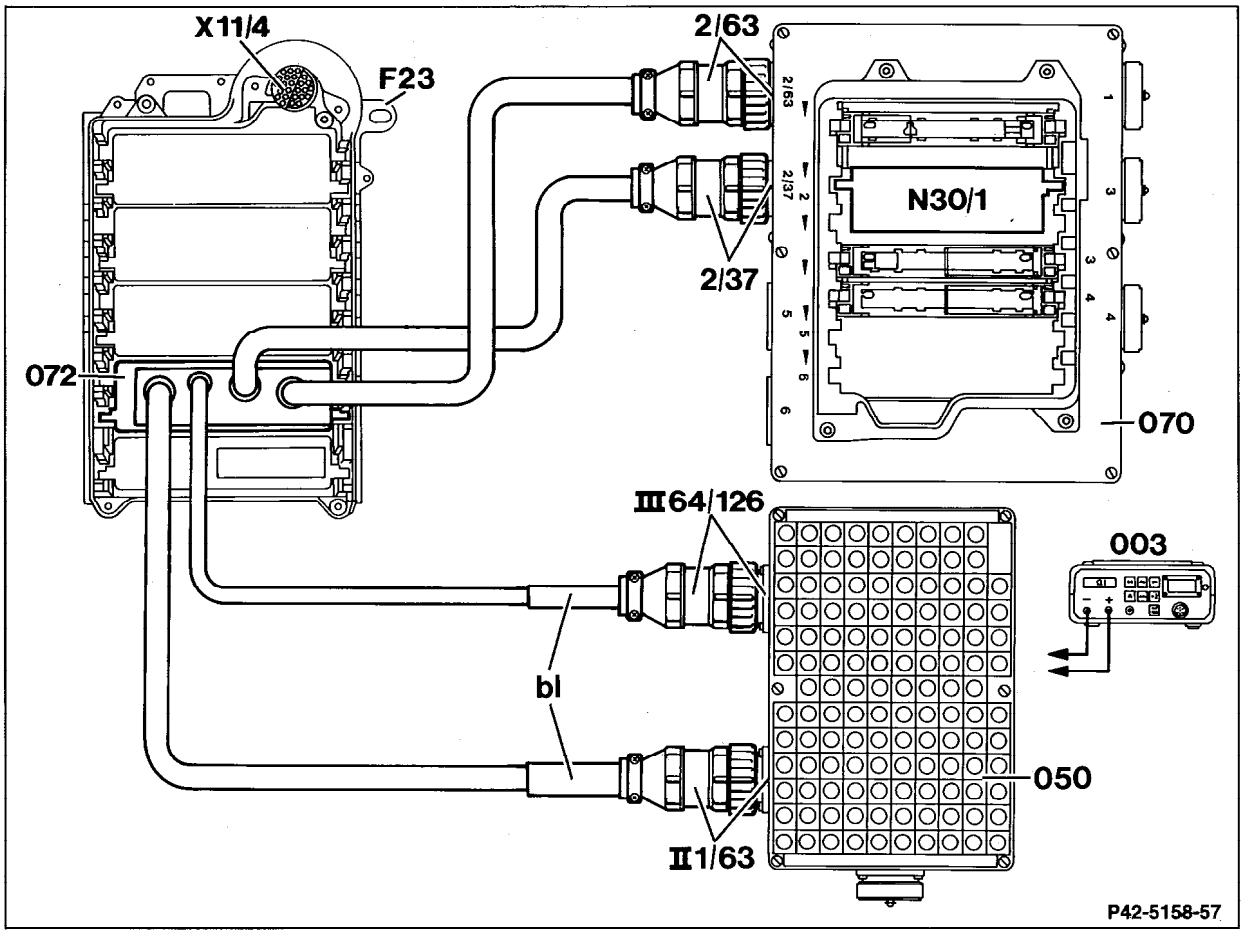
P42-0270-57

Figure 1

003	Digital multimeter
050	Socket box, (126-pole)
070	Contact box
072	Contact module 2
F23	Module box
N30/1	ABS/ASR control module
X11/4	Data link connector
bl	blue

Electrical Test Program - Preparation for Test

Connection Diagram - Socket Box
Model 129



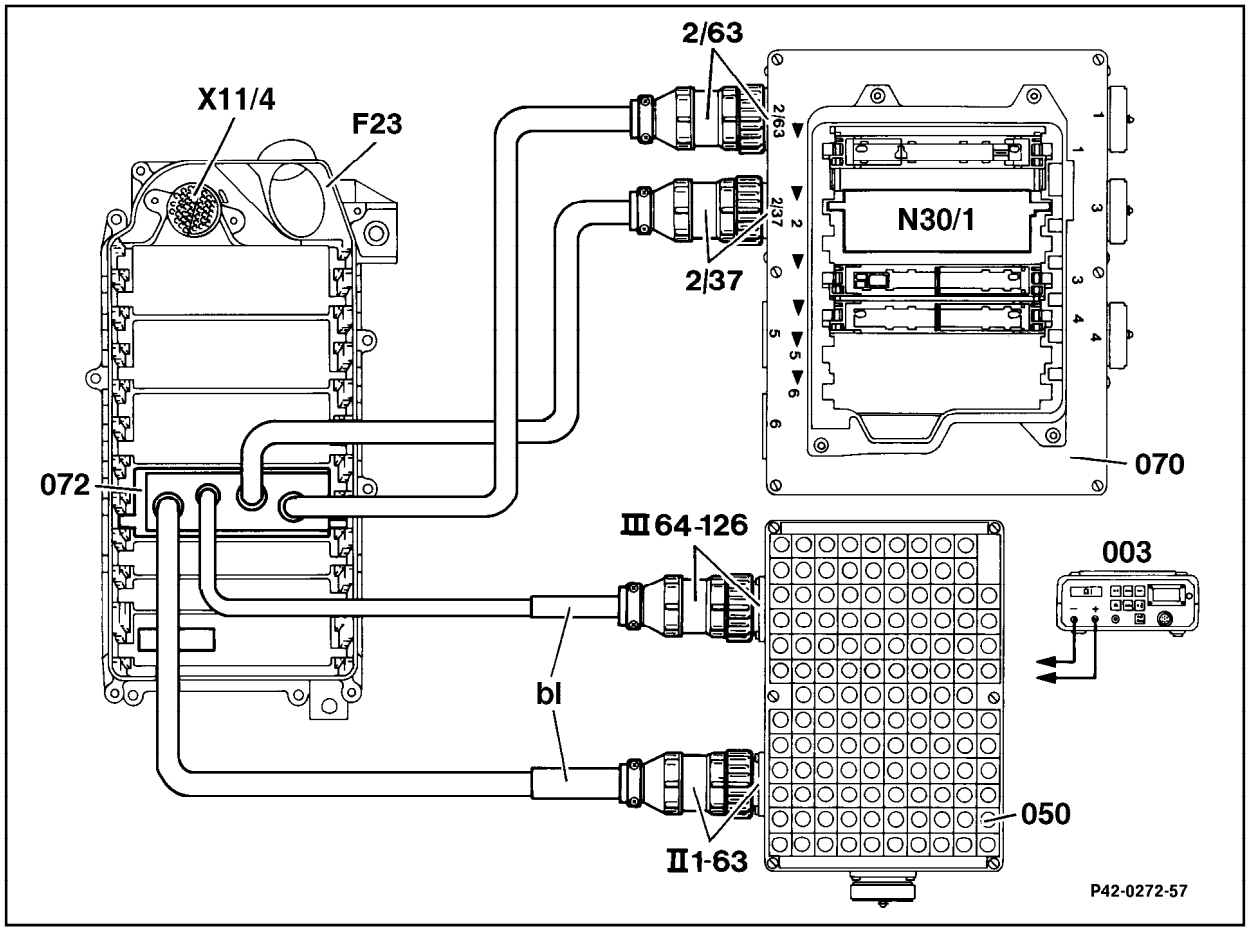
P42-5158-57

Figure 2

003	Digital multimeter
050	Socket box, (126-pole)
070	Contact box
072	Contact module 2
F23	Module box
N30/1	ABS/ASR control module
X11/4	Data link connector
bl	blue

Electrical Test Program - Preparation for Test

Connection Diagram - Socket Box
Model 140 with LH-SFI



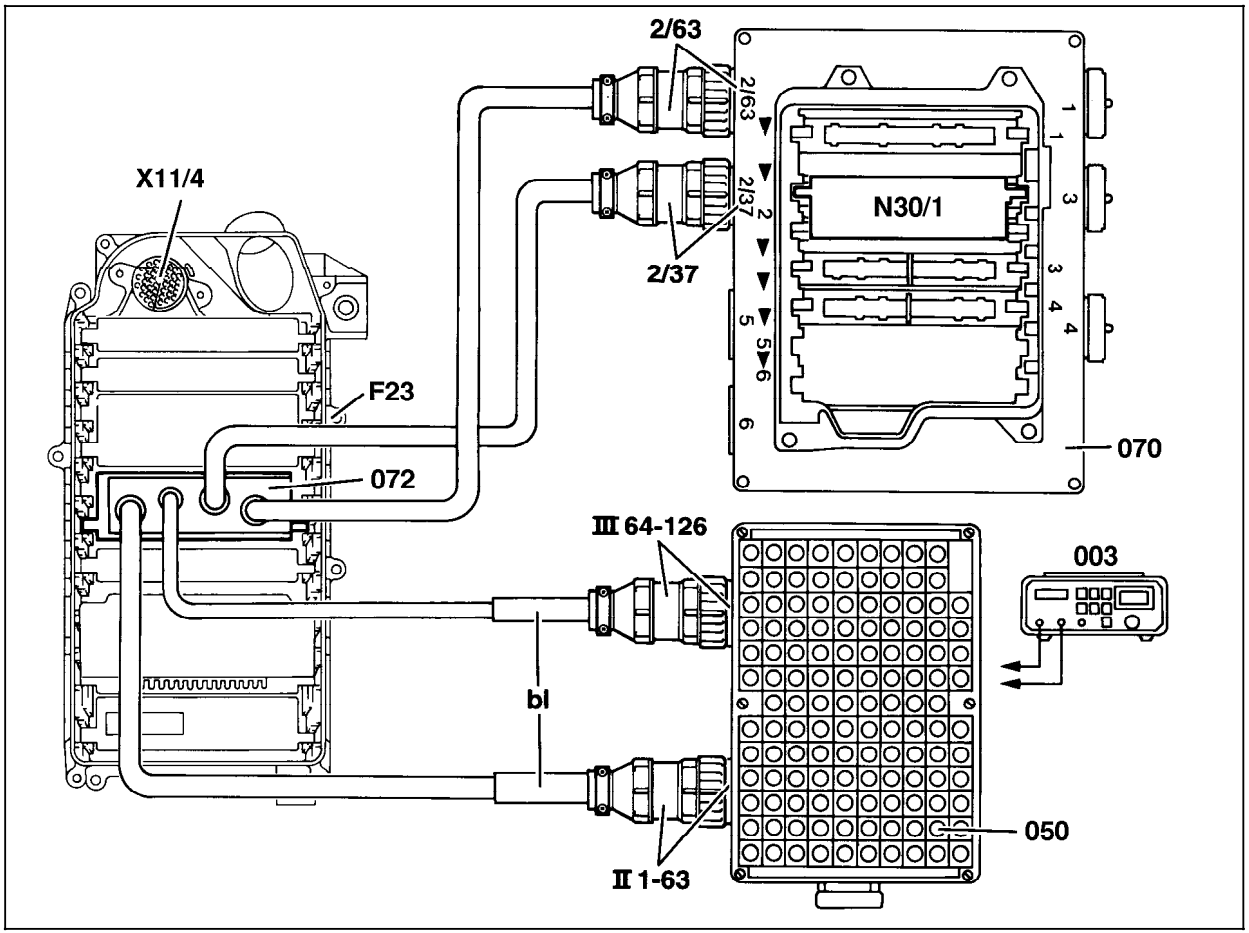
P42-0272-57

Figure 3

003	Digital multimeter
050	Socket box, (126-pole)
070	Contact box
072	Contact module 2
F23	Module box
N30/1	ABS/ASR control module
X11/4	Data link connector
bl	blue

Electrical Test Program - Preparation for Test

Connection Diagram - Socket Box
Model 140 with HFM-SFI



P42-5192-57

Figure 4

003	Digital multimeter
050	Socket box, (126-pole)
070	Contact box
072	Contact module 2
F23	Module box
N30/1	ABS/ASR control module
X11/4	Data link connector
bl	blue

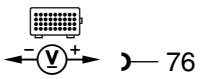
Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0 17	**ABS/ASR control module (N30/1)** Voltage supply Circuit 87	N30/1 32 (2.32) — V — 68 (1.27) 25 (2.25) — V — 68 (1.27) 40 (2.40) — V — 68 (1.27)	Ignition: **ON**	11– 14 V	⇒ 1.1
⇒ 1.1	Voltage supply from base module (BM) (N16/1)	N30/1 W16 W16/1 — V — 68 (1.27) W27	Ignition: **ON**	11 – 14 V	Fuse (F1) in N16/1, 1.1 or 1.2 23, Wiring, ⇒ 1.2.

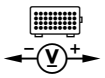
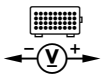
Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.2	Ground wire	N30/1  **Model 124** W27 Ω 32 (1.32) W16 Ω 25 (2.25) W16 Ω 40 (2.40) **Model 129** W27 Ω 32 (1.32) W27 Ω 25 (2.25) W27 Ω 40 (2.40) **Model 140** W16/1 Ω 32 (1.32) W16/1 Ω 25 (2.25) W16/1 Ω 40 (2.40)	Ignition: **OFF**	< 1 Ω	Wiring, **Model 124** Ground (W16), Ground (W27). **Model 129** Ground (W27). **Model 140** Ground (W16/1).

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 2.0	**ABS MIL (A1e17)**	N30/1  40 (2.40) — 76 (1.35)	Ignition: **ON** Engine: **at Idle**	< 2 V A1e17: **ON** 10 – 14 V A1e17: **OFF**	A1e17, ⇒ 2.1 12, Wiring, N30/1.
⇒ 2.1	Diode in ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1)	—	Ignition: **OFF** Disconnect N30/1 from contact box. Ignition: **ON** Engine: **at Idle**	 A1e17: **ON** A1e17: **ON**	Wiring, A7/3k1.

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 3.0	**ASR MIL (A1e22)**	N30/1  40 (2.40) — 76 (1.29)	Ignition: **ON** Engine: **at Idle**	< 2 V A1e22: **ON** 10 – 14 V A1e22: **OFF**	A1e22, ⇒ 3.1 12, Wiring, N30/1.
⇒ 3.1	Diode in ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1)	—	Ignition: **OFF** Disconnect N30/1 from contact box. Ignition: **ON** Engine: **at Idle**	 A1e22: **ON** A1e22: **ON**	Wiring, A7/3k1.
⇒ 4.0	**ASR warning lamp (A1e21)**	N30/1  78 (1.37) — 68 (1.27)	Ignition: **ON** Engine: **at Idle**	 A1e21: **ON** 10 – 14 V A1e21: **OFF** < 2 V	Wiring, A1e21.

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 5.0	**Diagnosis output**	N30/1 40 (2.40) — V — 57 (1.16)	Ignition: **ON**	10 – 14 V	Wiring, N30/1.
⇒ 6.0	**Circuit 61e voltage**	N30/1 40 (2.40) — V — 66 (1.25)	Ignition: **ON** Engine: **at Idle**	< 1 V 11 – 14 V	Wiring, Generator (G2).
⇒ 7.0	**ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1)** Control Monitoring	N30/1 27 (2.27) — V — 7 (2.7) N30/1 40 (2.40) — V — 1 (2.1) 40 (2.40) — V — 21 (2.21) 40 (2.40) — V — 22 (2.22)	Ignition: **ON**	10 – 14 V 11 – 14 V	12, ⇒ 7.1.

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 7.1	Voltage supply	N30/1 40 (2.40) — V — 7 (2.7)	Ignition: **ON**	11 – 14 V	Wiring, ⇒ 1.0, N30/1, ⇒ 7.2.
⇒ 7.2	Coil resistance	N30/1 27 (2.27) — Ω — 7 (2.7)	Ignition: **OFF** Disconnect N30/1 from contact box.	40 – 80 Ω	Wiring, A7/3k1, ⇒ 7.3
⇒ 7.3	Working contact	W14 (2.27) — Ω — N30/1 7 (2.7)	Ignition: **OFF** Disconnect N30/1 from contact box.	< 12 Ω	Wiring, A7/3k1.

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 8.0 10	**ABS/ASR hydraulic unit, high-pressure/return pump relay (A7/3k2)** Voltage supply	N30/1 40 (2.40) — V — 7 (2.7)	Ignition: **ON**	11 – 14 V	Wiring, ⇒ 8.1.
⇒ 8.1	Coil resistance	N30/1 28 (2.28) — Ω — 7 (2.7)	Ignition: **OFF** Disconnect N30/1 from contact box.	40 – 80 Ω	Wiring, A7/3k2.
⇒ 9.0 12 **Model 124.036 (02/93 →), 129.076, 140.04/05/07**	**Master brake cylinder switchover valve (Y61)** Internal resistance	N30/1 1 (2.1) — Ω — 19 (2.19)	Ignition: **OFF** Disconnect N30/1 from contact box.	7 – 8 Ω	Wiring, Y61.

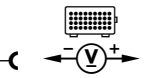
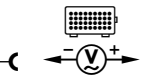
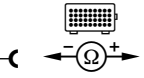
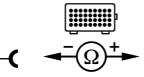
Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 10.0	**Stop lamp switch (S9/1)** N.O. contact	N30/1 40 (2.40) — V — 49 (1.8)	Ignition: **ON** Brake pedal not depressed. Depress brake pedal.	 < 1 V 11 – 14 V	Wiring, S9/1.
	N.C. contact	N30/1 40 (2.40) — V — 45 (1.4)	Brake pedal not depressed. Depress brake pedal.	11 – 14 V < 1 V	
⇒ 11.0	**Parking brake switch (S12)**	N30/1 47 (2.40) — V — 68 (1.6)	Ignition: **ON** Apply parking brake. Engine: **at Idle** Parking brake not applied.	 A1e7: **ON** < 1 V A1e7: **OFF** 11 – 14 V	Wiring, Parking brake indicator lamp (A1e7).

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 12.0	**ASR snow chain switch (S76)**	N30/1 40 (2.40) — V — 55 (1.14)	Engine: **at Idle** Press and hold switch S76 in **ON** position. Press and hold switch S76 in **OFF** position.	 < 1 V S76 indicator: **ON** 11 – 14 V S76 indicator: **OFF**	Wiring, S76, N30/1.
⇒ 13.0 14 29 **Model 124.036 (02/92 →), 129.076, 140.04/05/07**	**ABS lateral acceleration sensor (B24/2)** Voltage supply	N30/1 75 (1.34) — V — 64 (1.23)	Ignition: **ON**	 4.75 – 5.25 V	Wiring, B24/2, ⇒ 13.1.
	Sensor signal at rest	N30/1 75 (1.34) — V — 42 (1.1)		2.35 – 2.65 V	
	Sensor signal dynamic	N30/1 75 (1.34) — V~ — 42 (1.1)	Strongly shake vehicle in lateral direction.	> 0.01 V ~ Value changes with movement	

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 13.1	Voltage supply at sensor input	N30/1  75 (1.34) — 64 (1.23)	Ignition: **ON** Remove connector from B24/2.	4.75 – 5.25 V	Wiring, N30/1.
⇒ 14.0 **2 16 25**	**Left front axle VSS sensor (L6/1)**	N30/1  10 (2.10) — 30 (2.30)	Raise front of vehicle Ignition: **ON** Rotate left front wheel.	> 0.1 V ~	⇒ 14.1, ⇒ 14.2.
⇒ 14.1	Insulation resistance	N30/1  40 (2.40) — 30 (2.30)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 20 kΩ	Wiring
⇒ 14.2	Internal resistance	N30/1  10 (2.10) — 30 (2.30)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.8 – 3.7 kΩ	Wiring, L6/1.

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 15.0	**Left front axle VSS sensor (L6/1) output**	N30/1 40 (2.40) — V — 77 (1.36)	Raise front of vehicle. Ignition: **ON** Rotate left front wheel.	> 3 V ~	Wiring, ⇒ 14.0, ⇒ 15.1, N30/1.
⇒ 15.1	Load with control modules connected	N30/1 40 (2.40) — Ω — 77 (1.36)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 5 kΩ	Wiring, Control modules (N4/1, N4/3, N10/2, N22 or A2, A2/3y) connected.
⇒ 16.0 3 16 26	**Right front axle VSS sensor (L6/2)**	N30/1 13 (2.13) — V — 34 (2.34)	Raise front of vehicle Ignition: **ON** Rotate left front wheel.	> 0.1 V ~	⇒ 16.1, ⇒ 16.2.
⇒ 16.1	Insulation resistance	N30/1 40 (2.40) — V — 34 (2.34)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 20 kΩ	Wiring

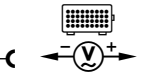
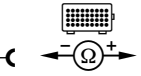
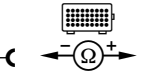
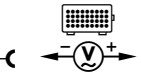
Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 16.2	Internal resistance	N30/1 13 (2.13) — Ω — 34 (2.34)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.8 – 3.7 kΩ	Wiring, L6/2.
⇒ 17.0	**Right front axle VSS sensor (L6/2) output**	N30/1 40 (2.40) — V~ — 79 (1.38)	Raise front of vehicle. Ignition: **ON** Rotate right front wheel.	> 3 V ~	Wiring, ⇒ 16.0, ⇒ 17.1, N30/1.
⇒ 17.1	Load with control modules connected	N30/1 40 (2.40) — Ω — 79 (1.38)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 5 kΩ	Wiring, Control modules (N16/1, N51) connected.
⇒ 18.0 4 16 27	**Left rear axle VSS sensor (L6/3)**	N30/1 73 (1.32) — V~ — 74 (1.33)	Raise rear of vehicle. Ignition: **ON** Rotate left rear wheel.	> 0.1 V ~	⇒ 18.1, ⇒ 18.2.

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 18.1	Insulation resistance	N30/1 40 (2.40) — Ω — 74 (1.33)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 20 kΩ	Wiring.
⇒ 18.2	Internal resistance	N30/1 73 (1.32) — Ω — 74 (1.33)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.6 – 3.2 kΩ	Wiring, L6/3.
⇒ 19.0	**Left rear axle VSS sensor (L6/3) output**	N30/1 40 (2.40) — V~ — 69 (1.28)	Raise rear of vehicle. Ignition: **ON** Rotate left rear wheel.	> 3 V ~	Wiring, ⇒ 18.0, ⇒ 19.1, N30/1.
⇒ 19.1	Load with control modules connected	N30/1 40 (2.40) — Ω — 69 (1.28)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 5 kΩ	Wiring, Control modules (N4/3, N49/1) connected.

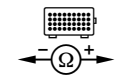
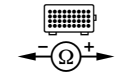
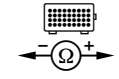
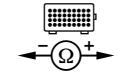
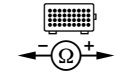
Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 20.0 5 16 28	**Rear axle VSS sensor (L6/4)**	N30/1  71 (1.30) — 72 (1.31)	Raise rear of vehicle. Ignition: **ON** Rotate right rear wheel.	> 0.1 V ~	⇒ 20.1, ⇒ 20.2.
⇒ 20.1	Insulation resistance	N30/1  40 (2.40) — 72 (1.31)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 20 kΩ	Wiring.
⇒ 20.2	Internal resistance	N30/1  71 (1.30) — 72 (1.31)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.6 – 3.2 kΩ	Wiring, L6/4.
⇒ 21.0	**Rear axle VSS sensor (L6/4) output**	N30/1  40 (2.40) — 67 (1.26)	Raise rear of vehicle. Ignition: **ON** Rotate right rear wheel.	> 3 V ~	Wiring, ⇒ 20.0, ⇒ 21.1, N30/1.

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 21.1	Load with control modules connected	N30/1 40 (2.40) — Ω — 67 (1.26)	Ignition: **OFF** Disconnect N30/1 from contact box.	> 5 kΩ	Wiring, Control modules (N4/3, N49/1) connected.
⇒ 22.0 21 22 23	**ABS/ASR hydraulic unit, pressure switch (A7/3s1)**	N30/1 37 (2.37) — V — 68 (1.27)	Engine: **at Idle** Pressure reservoir full Vent reservoir at connection “SP“ for a maximum of two seconds.	9 – 14 V < 3 V	⇒ 22.1, 33 ⇒ 1.0, 2.0, Pressure reservoir is empty. Wiring, A7/3.
⇒ 22.1	Pressure switch	N30/1 W14 — Ω — 37 (2.37)	Ignition: **ON** Disconnect relay (A7/3k1) from hydraulic unit. Disconnect N30/1 from contact box. Pressure reservoir: **Full** Pressure reservoir: **Empty**	< 1.8 kΩ > 20 kΩ	Wiring, A7/3.

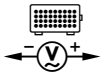
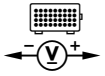
Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 23.0 6	**ABS/ASR hydraulic unit, left front axle solenoid valve (A7/3y1)** Internal resistance	N30/1  20 (2.20) — 21 (1.21)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.7 – 2.2 Ω	Wiring, A7/3.
⇒ 24.0 7	**ABS/ASR hydraulic unit, right front axle solenoid valve (A7/3y2)** Internal resistance	N30/1  39 (2.39) — 21 (1.21)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.7 – 2.2 Ω	Wiring, A7/3.
⇒ 25.0 8	**ABS/ASR hydraulic unit, left rear axle solenoid valve (A7/3y3)** Internal resistance	N30/1  2 (2.2) — 21 (1.21)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.7 – 2.2 Ω	Wiring, A7/3.
⇒ 26.0 9	**ABS/ASR hydraulic unit, right rear axle solenoid valve (A7/3y4)** Internal resistance	N30/1  24 (2.24) — 21 (1.21)	Ignition: **OFF** Disconnect N30/1 from contact box.	0.7 – 2.2 Ω	Wiring, A7/3.
⇒ 27.0 20	**ABS/ASR hydraulic unit, switchover/solenoid valve (A7/3y5)** Internal resistance	N30/1  5 (2.5) — 21 (1.21)	Ignition: **OFF** Disconnect N30/1 from contact box.	1.8 – 3.0 Ω	Wiring, A7/3.

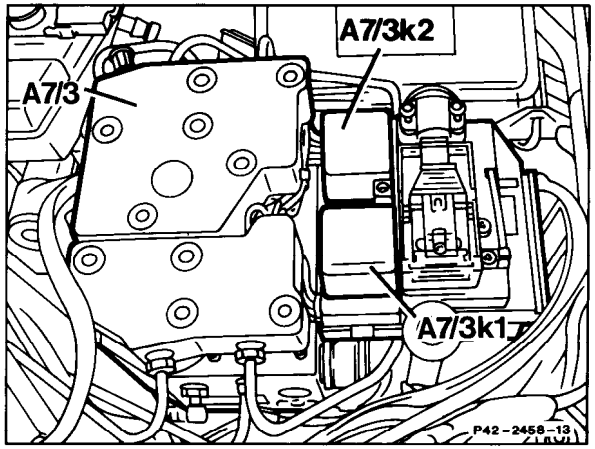
Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 28.0 30 31 32 33	**CAN data bus**	N30/1 L — ◄ –Ω+ ► — H	Ignition: **OFF** Disconnect N30/1 or contact module 2. Connect ohmmeter directly to both wide terminals on N30/1 connector.	55 – 65 Ω	CAN data line, ⇒ 28.1.
⇒ 28.1	**CAN element in LH-SFI or engine control module (N3/1, N3/4 respectively)** Resistance	**Engine 104, 119** N3/1 L — ◄ –Ω+ ► — H	Disconnect N3/1 or N3/4. Test directly on control module.	115 – 125 Ω	N3/1 or N3/4, ⇒ 28.2.
⇒ 28.2	**CAN element in DI control module (N1/3, N1/4, N1/5)** Resistance	**Engine 104 LH-SFI, Engine 119 LH-SFI** N1/3 3 — ◄ –Ω+ ► — 4 **Engine 120** N1/4 N1/4 3 — ◄ –Ω+ ► — 4	Disconnect connector “B“ from N1/3. Test directly on control module. Disconnect connector “B“ from control modules N1/4 and N1/5. Test directly on control modules.	115 – 125 Ω	N1/3 N1/4, N1/5

Electrical Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 29.0 **Model 140.032 (06/93 →)**	**VSS sensor output status** Signal: Vehicle stationary	N30/1  40 (2.40) — 44 (1.3)	Ignition: **ON**	> 3 V ~	⇒ 29.1
⇒ 29.1	Signal: Fault	N30/1  40 (2.40) — 44 (1.3)	Ignition: **ON**	< 10 V	⇒ 14.0, N30/1.

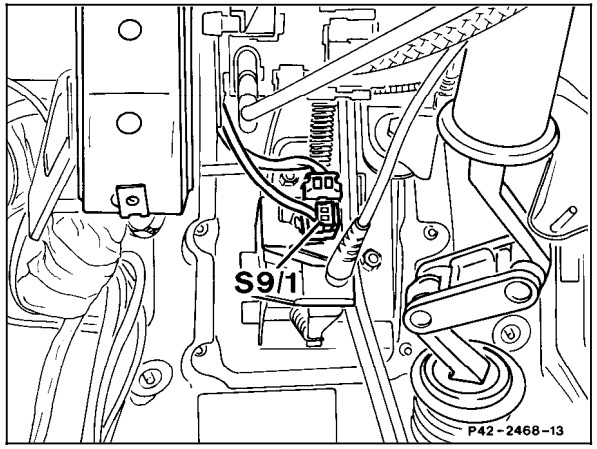
Electrical Test Program - Test



P42-2458-13

Figure 1

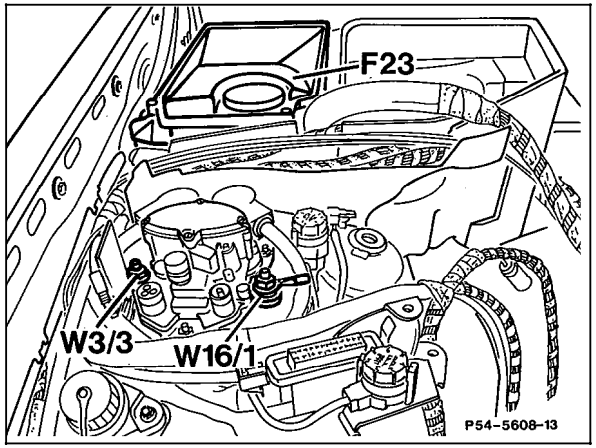
A7/3k1	Solenoid valve relay
A7/3k2	High-pressure/return pump relay



P42-2468-13

Figure 2

S9/1	Stop lamp switch (4-pole)



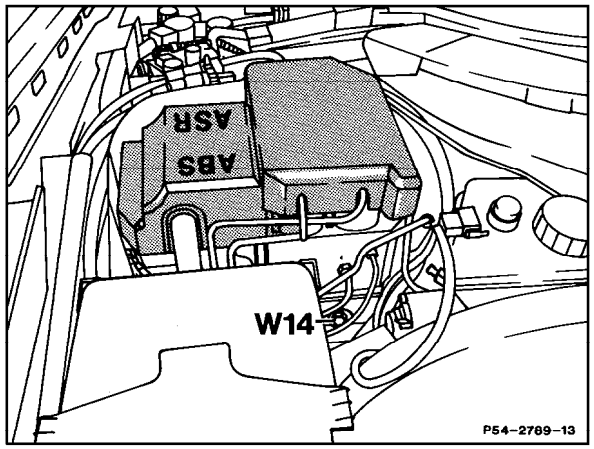
P54-5608-13

Figure 3

Model 140

W3/3	Ground (right front wheelhousing - DI)
W16/1	Ground (right front spring tower)

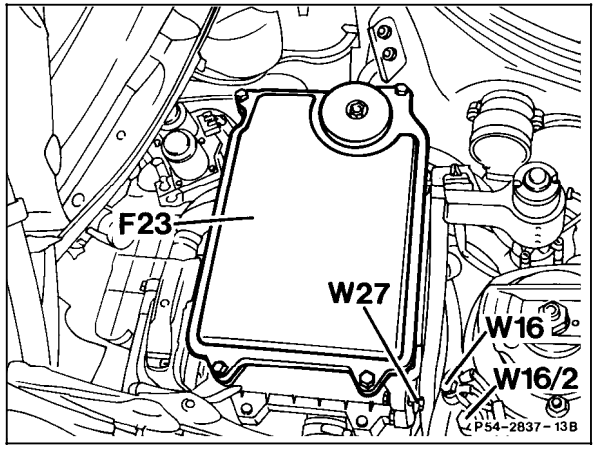
Electrical Test Program - Test



P54-2789-13

Figure 4

W14 Ground (ABS hydraulic unit bracket)

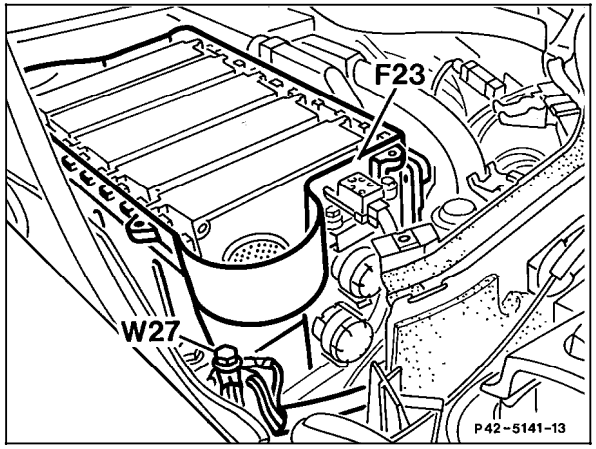


P54-2837-13B

Figure 5

Model 124

W16 Ground (component compartment)
W27 Ground (module box bracket)



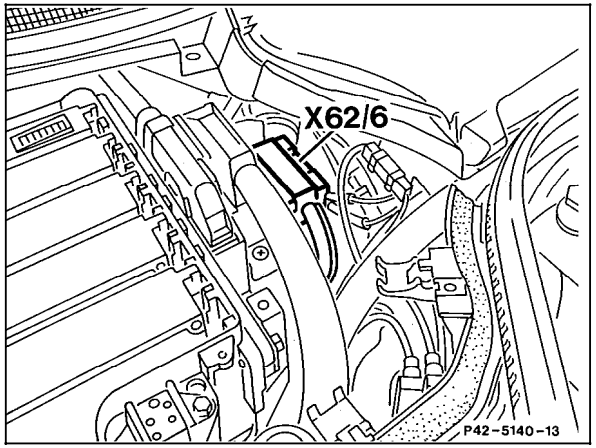
P42-5141-13

Figure 6

Model 129

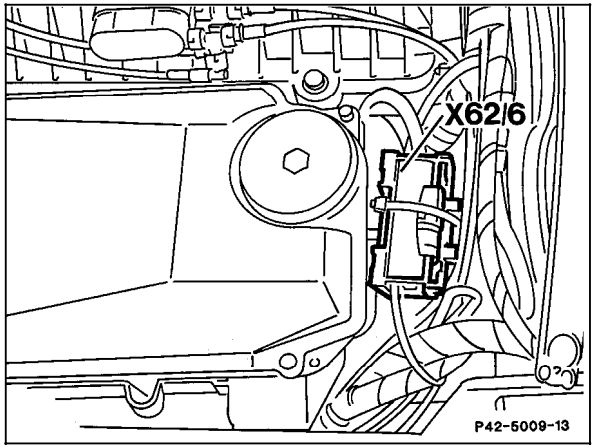
W27 Ground (module box bracket)

Electrical Test Program - Test



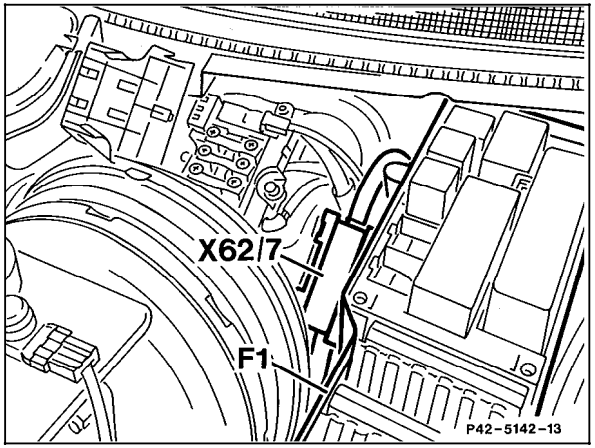
P42-5140-13

Figure 7
Model 129
X62/6 Right front axle VSS sensor connector (component compartment)



P42-5009-13

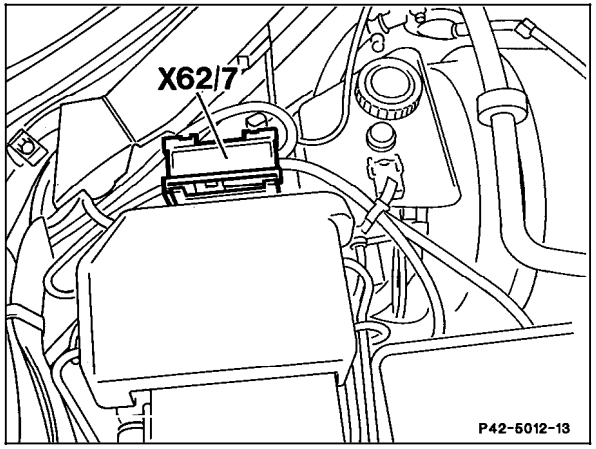
Figure 8
Model 140
X62/6 Right front axle VSS sensor connector (component compartment)



P42-5142-13

Figure 9
Model 129
X62/7 Left front axle VSS sensor connector (component compartment)

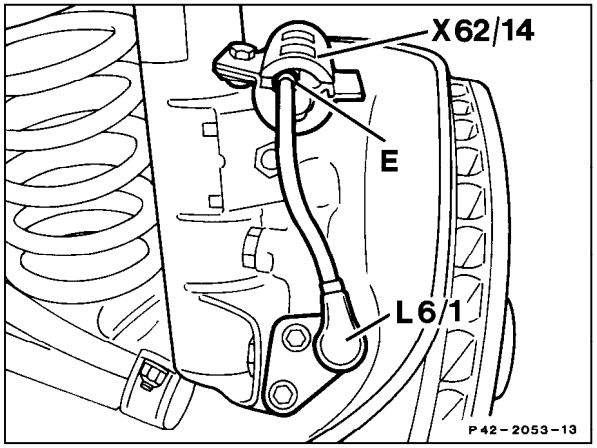
Electrical Test Program - Test



P42-5012-13

Figure 10
Model 140

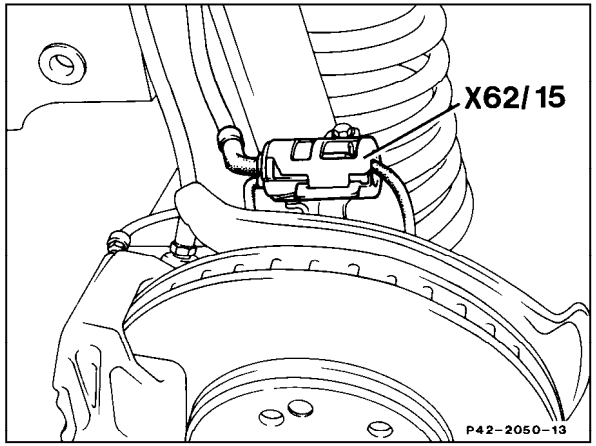
X62/7 Left front axle VSS sensor connector (component compartment)



P42-2053-13

Figure 11
Model 129

L6/1 Left front axle VSS sensor
X62/14 Left front axle VSS sensor connector (axle spindle)

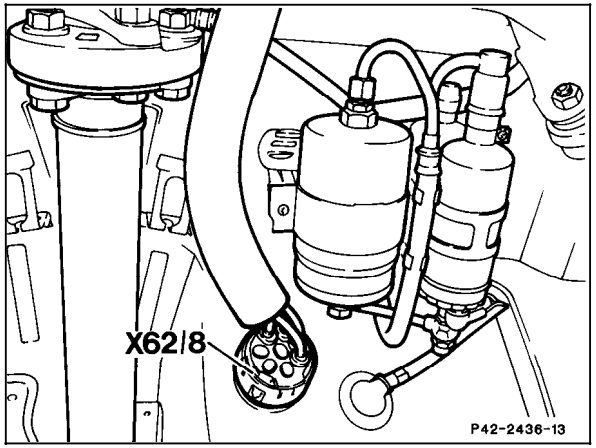


P42-2050-13

Figure 12
Model 129

X62/15 Right front axle VSS sensor connector (axle spindle)

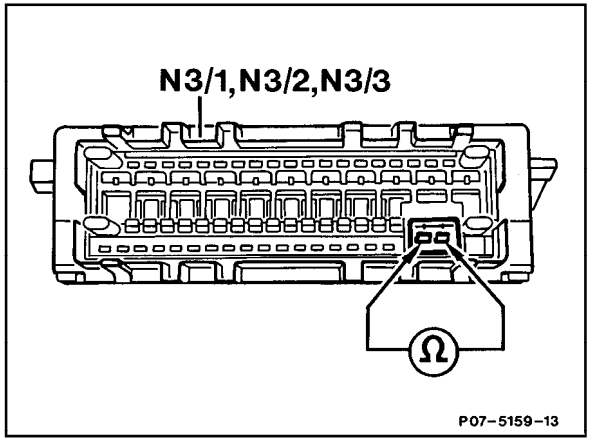
Electrical Test Program - Test



P42-2436-13

Figure 13

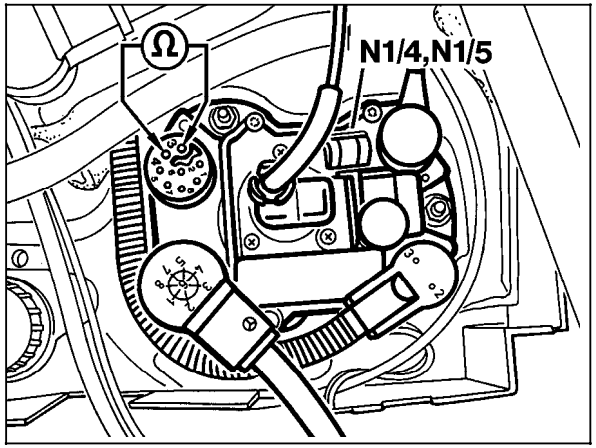
X62/8	Rear axle multiple circuit junction connector



P07-5159-13

Figure 14

N3/1	LH-SFI control module
N3/2	Left LH-SFI control module
N3/3	Right LH-SFI control module



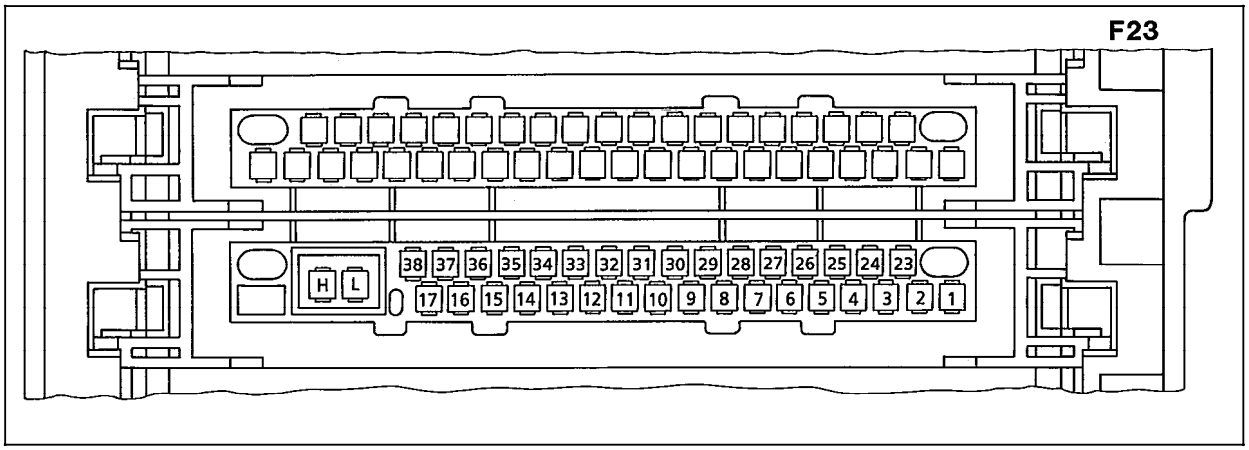
P15-5058-13

Figure 15

N1/3	DI/KSS control module
N1/4	Left DI control module
N1/5	Right DI control module

Electrical Test Program - Test

ABS/ASR control module (N30/1) layout connector 1 (component compartment)



P07-5171-53

Figure 16

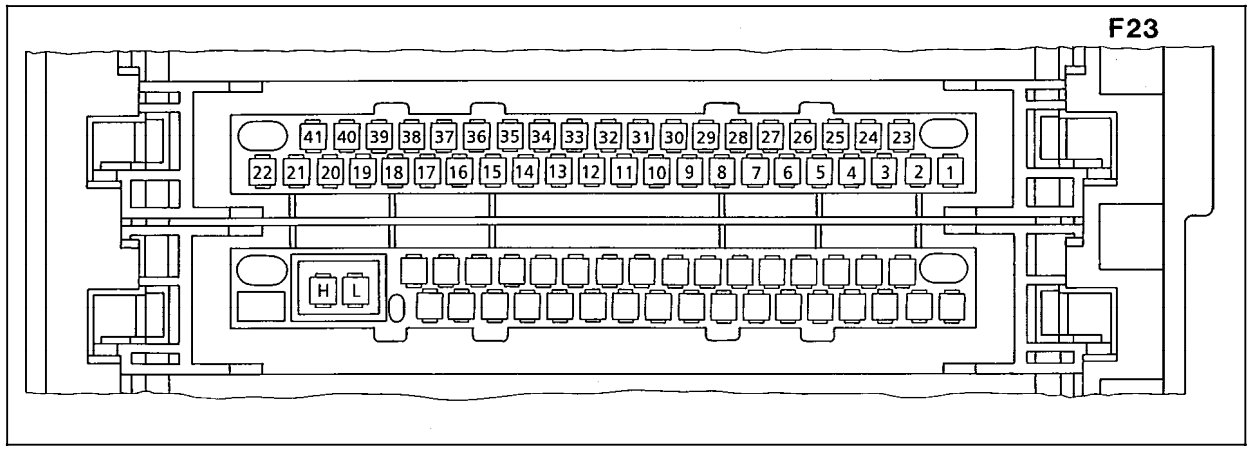
F23	Module box
1	**Model 124.036 (02/93 →), 129.076, 140.04/05/07** ABS lateral acceleration sensor (B24/2)
2	Not used
3	**Model 140.032 (06/93 →)** VSS sensor output status
4	Stop lamp switch (S9/1), N.C. contact
5	Not used
6	Parking brake switch (S12)
7	Not used
8	Stop lamp switch (S9/1), N.O. contact
9-13	Not used
14	ASR snow chain switch (S76)
15	Not used
16	Diagnosis output
17-22	Not used
23	**Model 124.036 (02/93 →), 129.076, 140.04/05/07** ABS lateral acceleration sensor (B24/2), voltage supply
24	ASR snow chain switch (S76), indicator lamp
25	Circuit 61e voltage
26	Right rear VSS sensor (L6/4) output
27	Voltage supply from BM (N16/1), circuit 87
28	Left rear VSS sensor (L6/3) output
29	ASR MIL (A1e22)
30	Right rear axle VSS sensor (L6/4) (–)
31	Right rear axle VSS sensor (L6/4) (+)
32	Left rear axle VSS sensor (L6/3) (–)
33	Left rear axle VSS sensor (L6/3) (+)
34	**Model 129.076, 140.04/05/07** ABS lateral acceleration sensor (B24/2), ground
35	ABS MIL (A1e17)
36	Left front VSS sensor (L6/1) output
37	ASR warning lamp (A1e21)
38	Right front VSS sensor (L6/2) output

Layout of connector 3 (CAN)

L	CAN data line (–)
H	CAN data line (+)

Electrical Test Program - Test

ABS/ASR control module (N30/1) layout connector 2 (engine compartment)



P07-5170-53

Figure 17

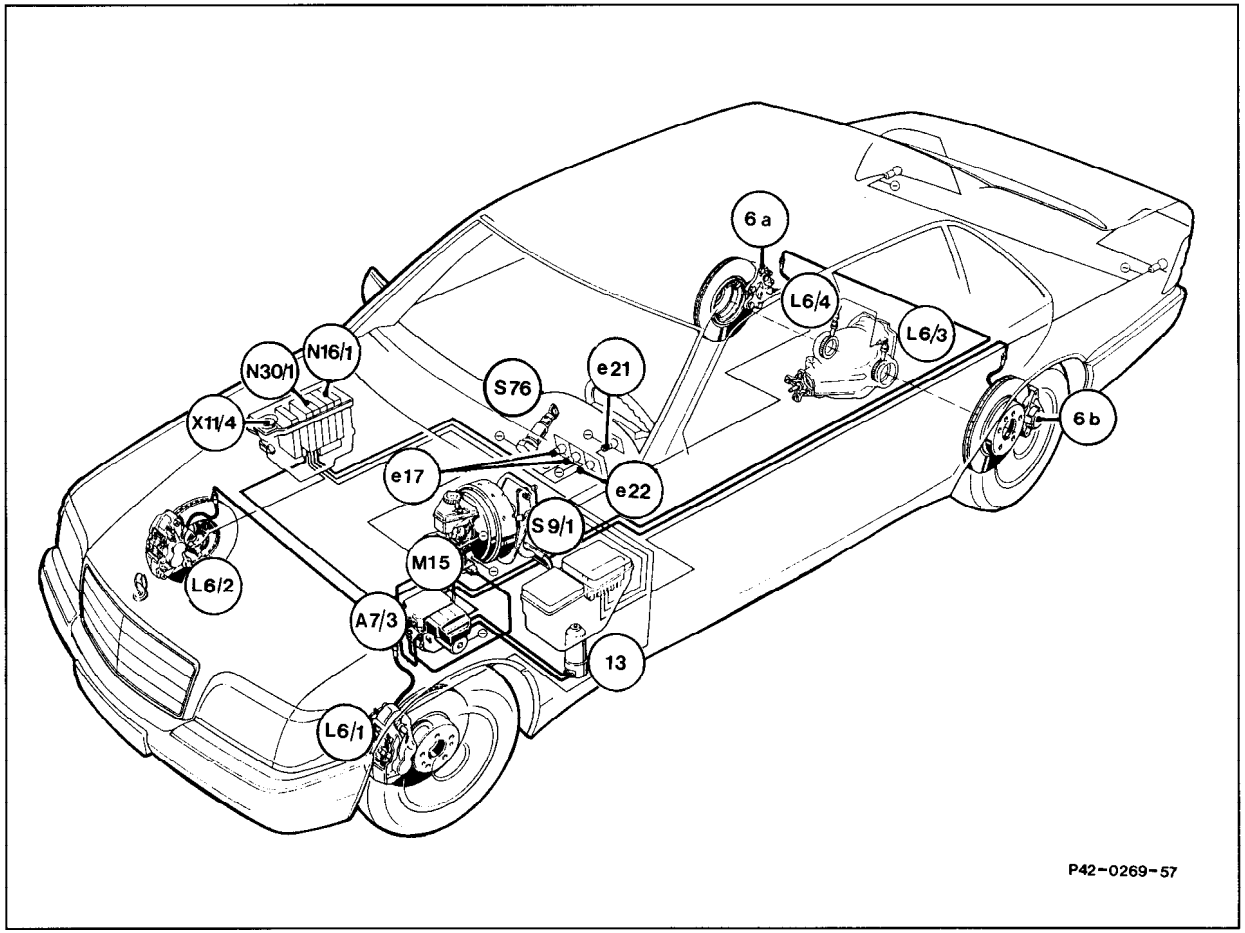
F23	Module box
1	ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1), monitor
2	ABS/ASR hydraulic unit, left rear axle solenoid valve (A73y3) (–)
3-4	Not used
5	ABS/ASR hydraulic unit, switchover/solenoid valve (A7/3y5) (–)
6	Not used
7	ABS/ASR hydraulic unit, high-pressure/return pump relay (A7/3k2) and ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1), voltage supply
8-9	Not used
10	Left front axle VSS sensor (L6/1) (–)
11-12	Not used
13	Right front axle VSS sensor (L6/2) (–)
14-18	Not used
19	**Model 124.036 (02/93), 129.076. 140.04/05/07** Master brake cylinder switchover valve (Y61), control
20	ABS/ASR hydraulic unit, left front axle solenoid valve (A73y1) (–)
21	ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1), monitor
22	ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1), monitor
23	Not used
24	ABS/ASR hydraulic unit, right rear axle solenoid valve (A7/3y4) (–)
25	**Model 129** Ground, module box bracker (W27) **Model 124, 140** Ground (W16 or W16/1)
26	Not used
27	ABS/ASR hydraulic unit, solenoid valve relay (A7/3k1), ground
28	ABS/ASR hydraulic unit, high-pressure/return pump relay (A7/3k2), ground
29	Not used
30	Left front axle VSS sensor (L6/1) (+)
31	Not used
32	**Model 124, 129** Ground, module box bracker (W27) **Model 140** Ground, right front spring tower (W16/1)
33	Not used
34	Right front axle VSS sensor (L6/2) (+)
35	Not used
36	ABS/ASR hydraulic unit, high-pressure/return pump relay (A7/3k2), monitor
37	ABS/ASR hydraulic unit, pressure switch (A7/3s1)
38	Not used
39	ABS/ASR hydraulic unit, right front axle solenoid valve (A73y2) (–)
40	**Model 129** Ground, module box bracker (W27) **Model 124, 140** Ground (W16 or W16/1)
41	ASR charging pump (M15)

Layout of connector 3 (CAN)

L	CAN data line (–)
H	CAN data line (+)

Hydraulic Test Program - Component Locations

Shown on Model 140



P42-0269-57

Figure 1

6a	Right rear brake caliper
6b	Left rear brake caliper
13	Pressure reservoir **Model 129.063/067:** Located on right side of engine compartment
A1e17	ABS MIL
A1e21	ASR warning lamp
A1e22	ASR MIL
A7/3	ABS/ASR hydraulic unit
L6/1	Left front axle VSS sensor
L6/2	Right front axle VSS sensor
L6/3	Left rear axle VSS sensor
L6/4	Right rear axle VSS sensor
M15	ASR charging pump
N16/1	Base module (BM)
N30/1	ABS/ASR control module
S9/1	Stop lamp switch
S76	ASR snow chain switch (with indicator)
X11/4	Data link connector

Hydraulic Test Program - Preparation for Test

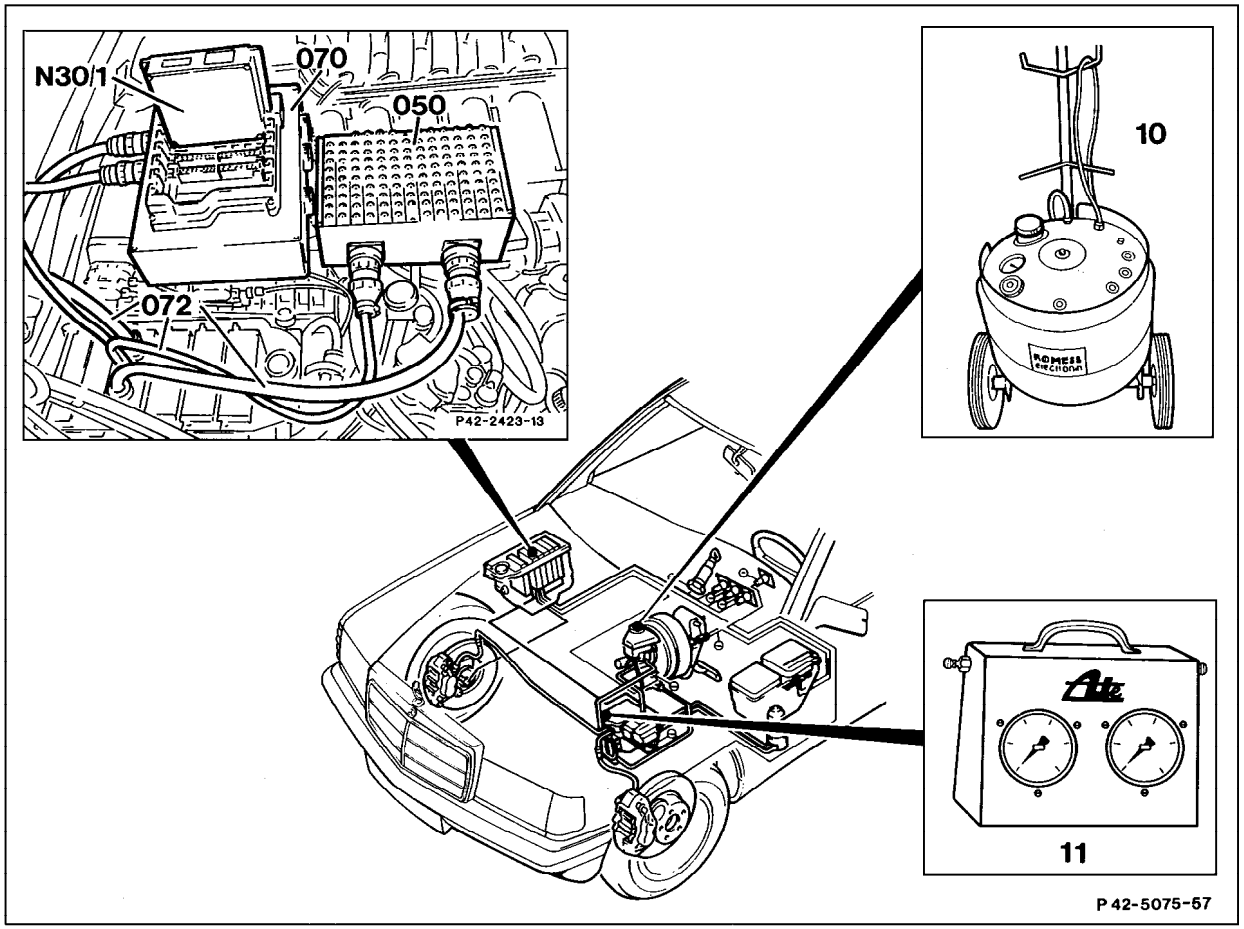


Figure 1

050	Socket box, (126-pole)
070	Contact box
072	Contact module 2
10	Brake bleeder
11	Pressure tester
N30/1	ABS/ASR control module

P42-5075-57

Hydraulic Test Program - Preparation for Test

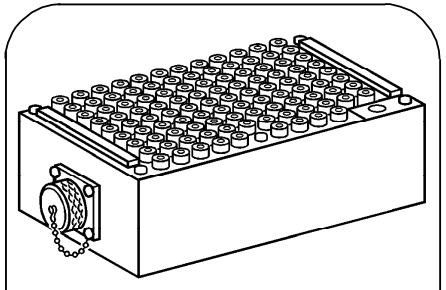
1. Connect brake bleeder.
2. Release system pressure. Ignition: **OFF**. Open vent screw “SP“ on ABS/ASR hydraulic unit (A7/3) and allow contents of pressure reservoir to drain into container for brake fluid.
3. Connect pressure tester to “SP“ on ABS/ASR hydraulic unit (A7/3).

⚠ WARNING!

A hydraulic oil system pressure tester may not be used on a brake fluid system. The mineral oil in the tester will mix with the brake fluid and result in brake failure!

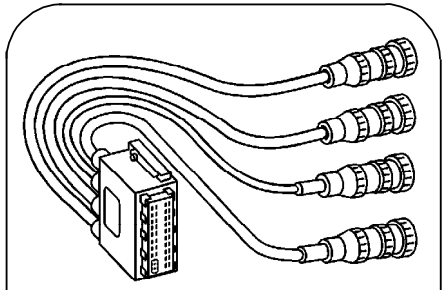
4. Ignition: **OFF**.
5. Disconnect ABS/ASR control module (N30/1).
6. Connect socket box with contact module 2 according to connection diagram (only needed for ⇒ 1.0).
7. Release system pressure by opening vent screw (d) on pressure tester (11).
8. Upon completion of test, load pressure reservoir (connect N30/1 and Engine: **at Idle** until reservoir is full), and then correct fluid level in brake fluid reservoir.

Special Tools



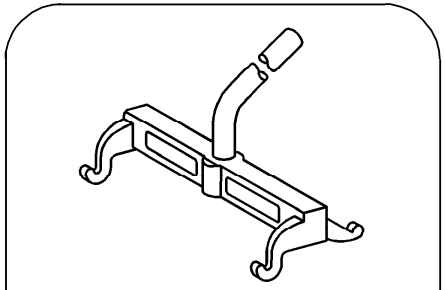
129 589 00 21 00

126-pin socket box



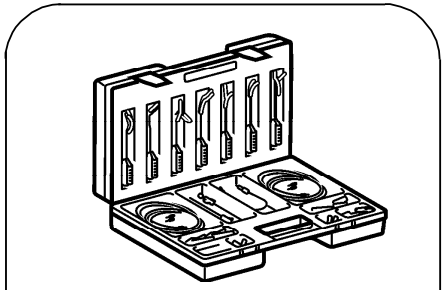
140 589 02 63 00

Contacting module 2



140 589 01 33 00

Mounting lever

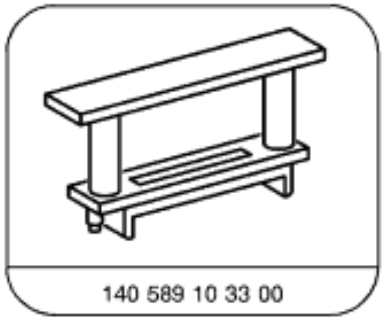


201 589 00 99 00

Electrical connecting set

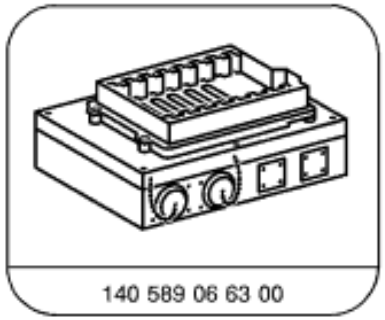
Hydraulic Test Program - Preparation for Test

Special Tools



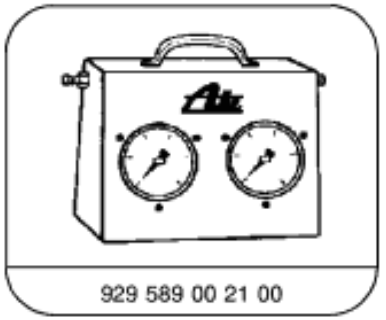
140 589 10 33 00

Spacer



140 589 06 63 00

Contacting box



929 589 00 21 00

Pressure tester

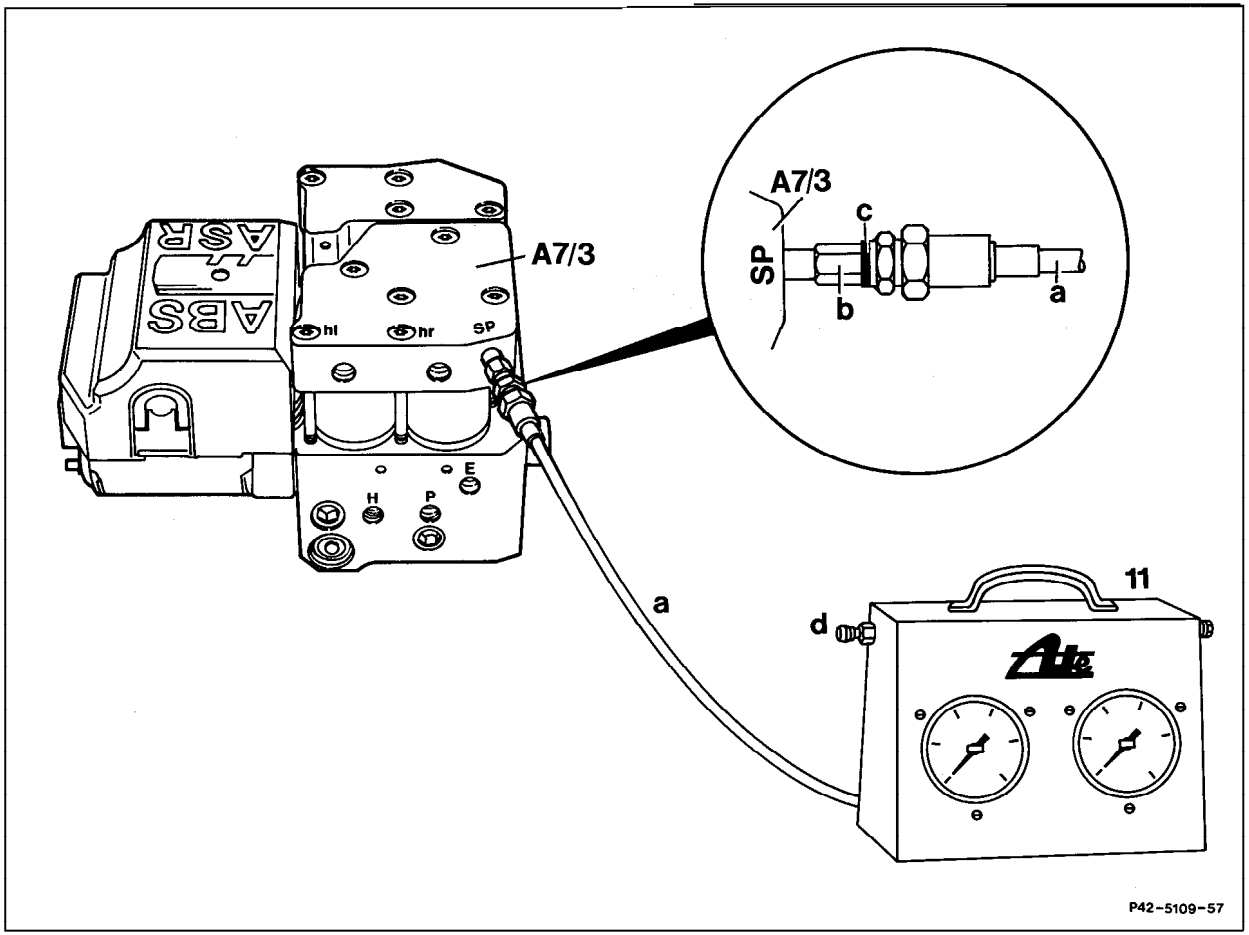
Equipment

Brake bleeder [1])	Ammco model 7301 with adaptor no. 7309

[1]) Available through the MBUSA Standard Equipment Program.

Hydraulic Test Program - Preparation for Test

Connection Diagram - Pressure Tester
ABS/ASR hydraulic unit (A7/3) connection "SP"



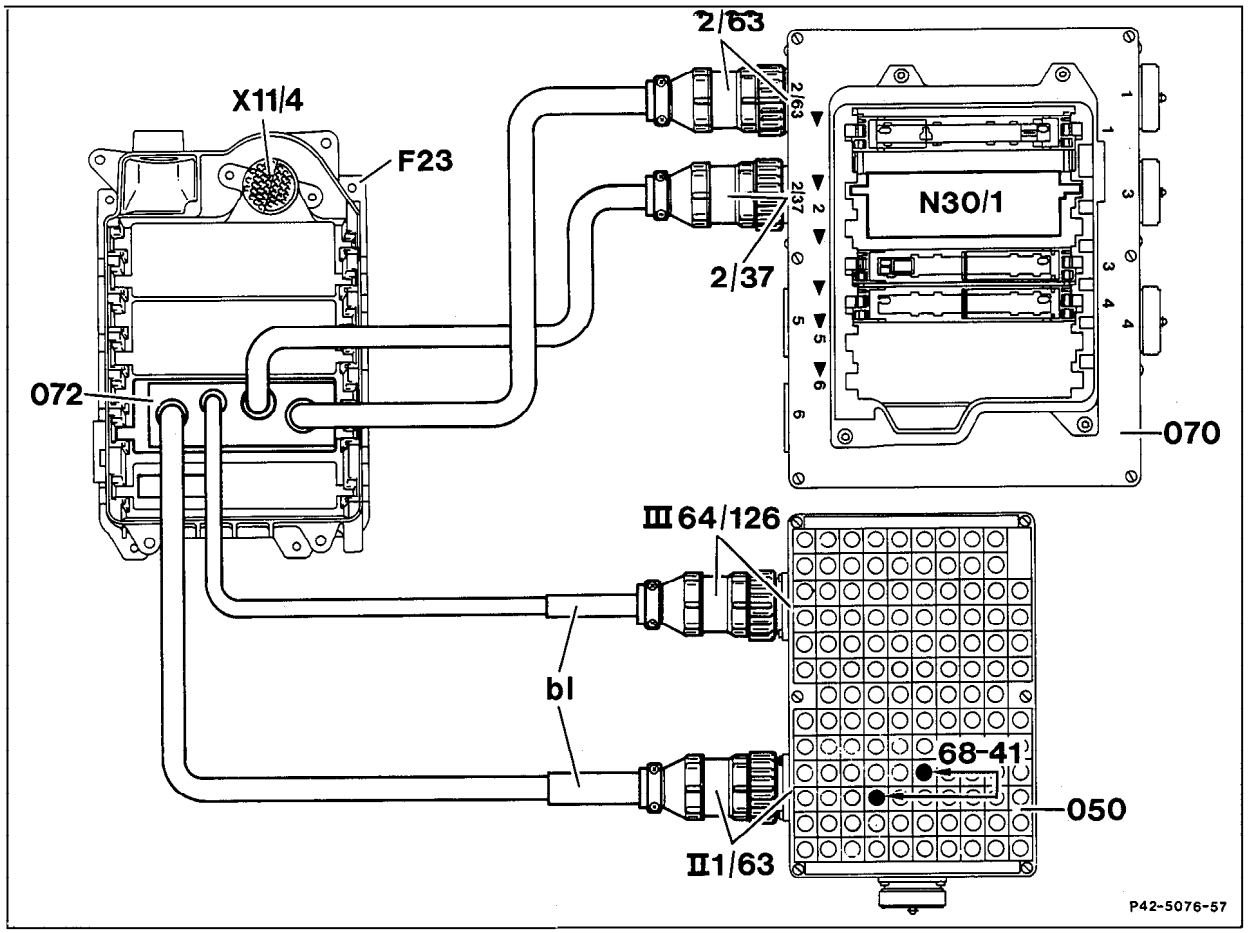
P42-5109-57

Figure 2

A7/3	ABS/ASR hydraulic unit
11	Pressure tester
a	Hose
b	Adaptor
c	Seal
d	Vent screw

Hydraulic Test Program - Preparation for Test

Connection Diagram - Socket Box
Model 124 (only needed for ⇒ 1.0)



P42-5076-57

Figure 3

050	Socket box, (126-pole)
072	Contact module 2
F23	Module box
X11/4	Data link connector
bl	blue

Hydraulic Test Program - Preparation for Test

Connection Diagram - Socket Box
Model 129 (only needed for ⇒ 1.0)

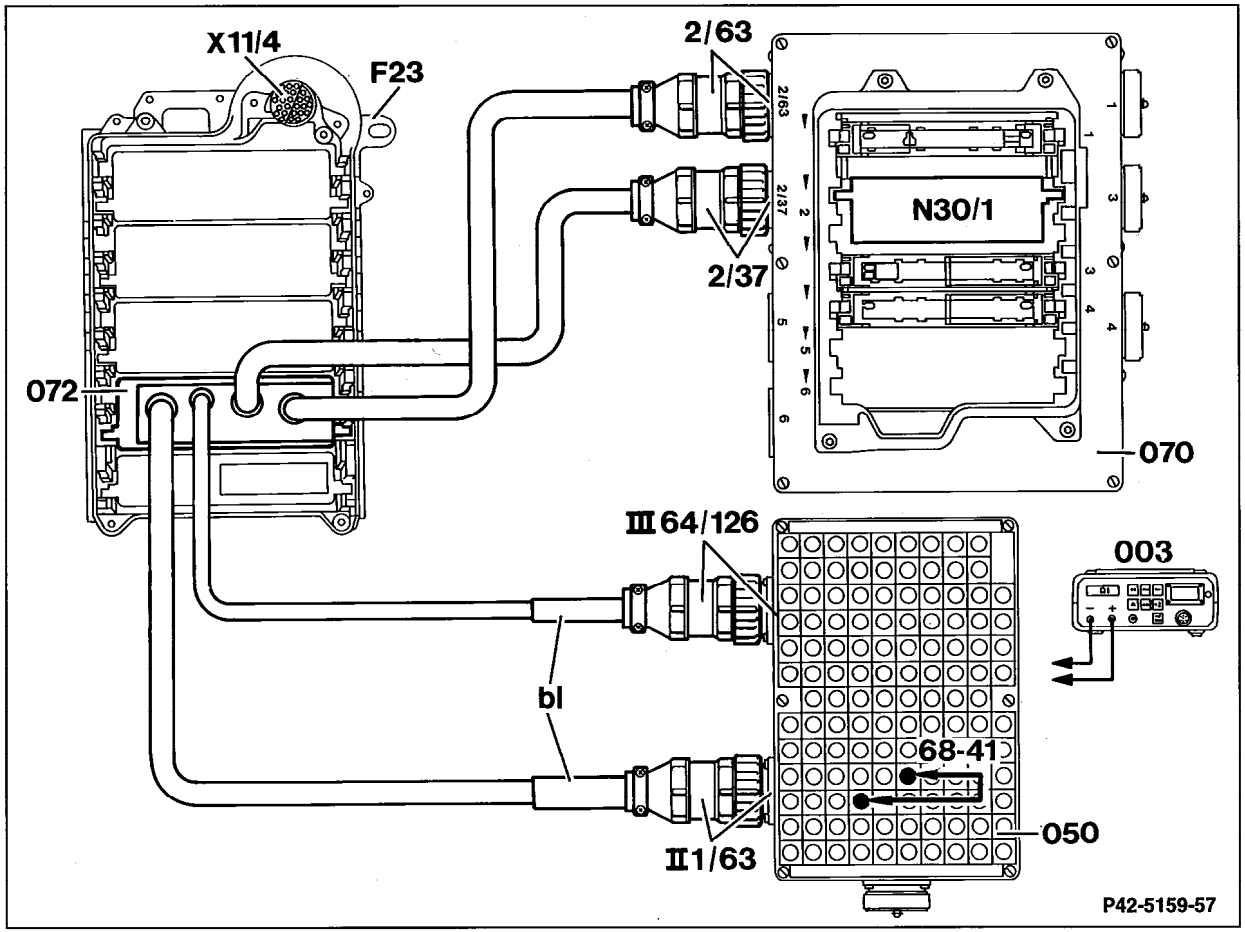


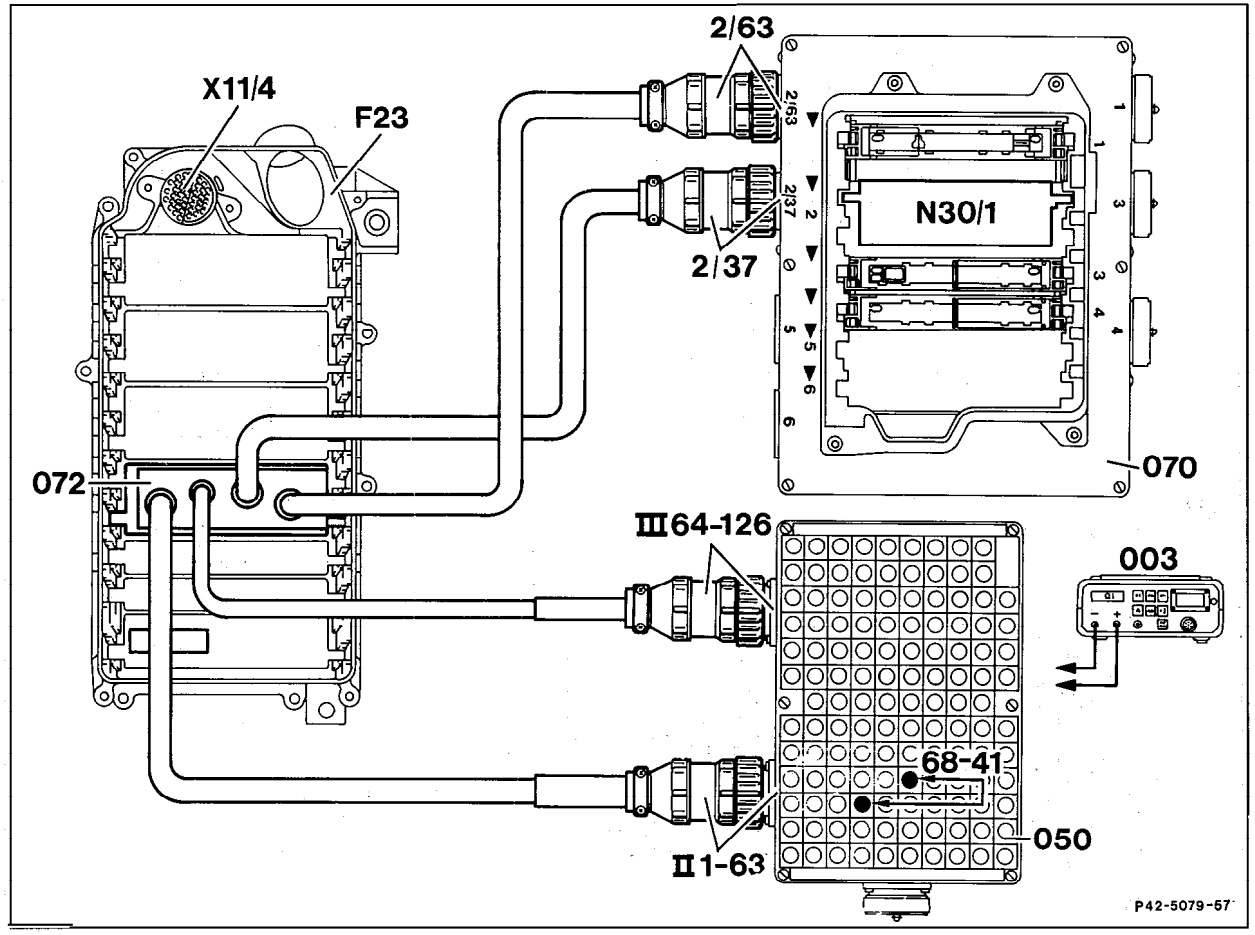
Figure 4

050	Socket box, (126-pole)
072	Contact module 2
F23	Module box
X11/4	Data link connector
bl	blue

P42-5159-57

Hydraulic Test Program - Preparation for Test

Connection Diagram - Socket Box
Model 140 (only needed for ⇒ 1.0)

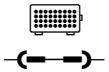


P42-5079-57

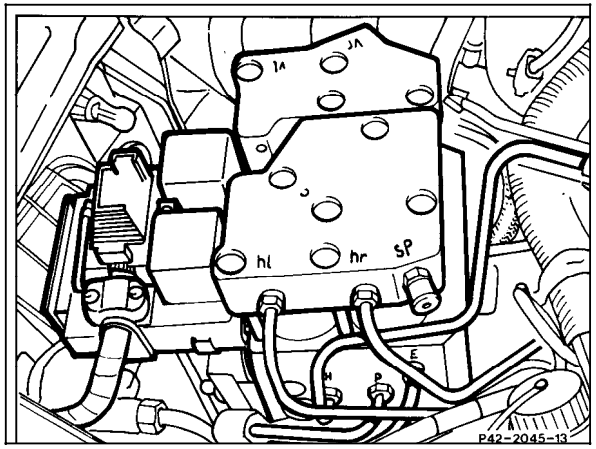
Figure 5

050	Socket box, (126-pole)
072	Contact module 2
F23	Module box
X11/4	Data link connector
bl	blue

Hydraulic Test Program - Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0 21 24	**ASR charging pump (M15)**	10 bar at connection "SP"  41 68	Ignition: **ON** (for a maximum of 60 s)	1.8 – 11 bar [2])	Wiring, Hydraulic connections leaking, M15
⇒ 2.0 10 21 24	**ABS/ASR hydraulic unit, high-pressure/return pump (A7/3m1) and pressure reservoir**	250 bar at connection "SP"	Engine: **at Idle**	Pressure increases quickly to 50 – 110 bar, then increase slowly to 150 – 200 bar. Charging time: maximum of 60 s	Hydraulic connections leaking. If there is no pressure increase, or the increase takes too long (more than 60 s): 23 ⇒ 22.0, A7/3. If the pressure increase quickly to < 50 bar, and then slowly increases to maximum value, or then increases quickly and steadily to maximum value: Replace pressure reservoir.

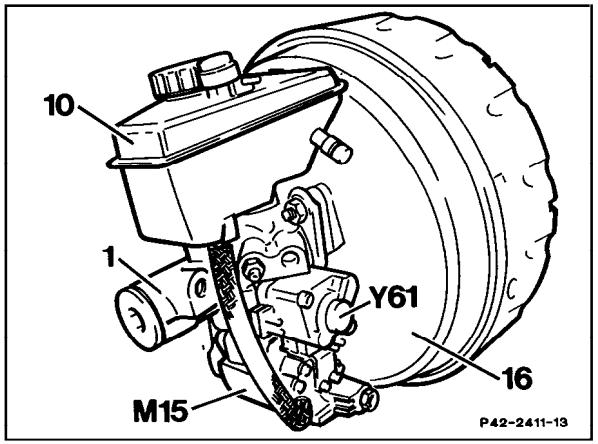
Hydraulic Test Program - Test



P42-2045-13

Figure 1

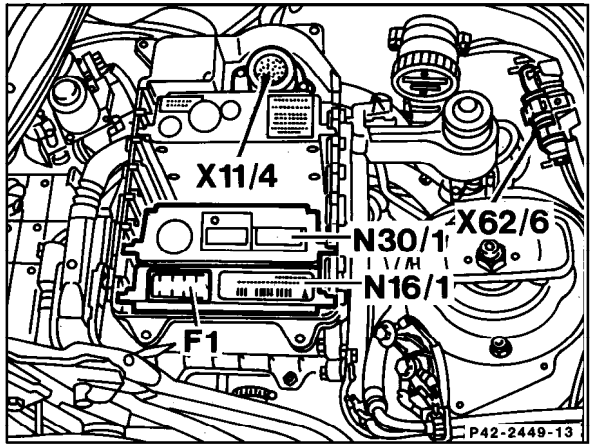
ABS/ASR hydraulic unit (A7/3) vent screw “SP“



P42-2411-13

Figure 2

M15 ASR charging pump

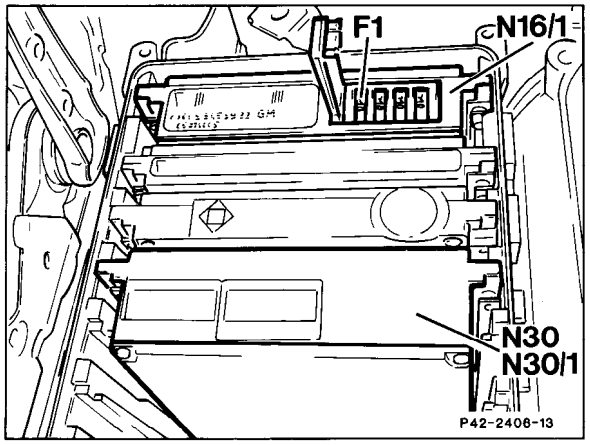


P42-2449-13

Figure 3
Model 124

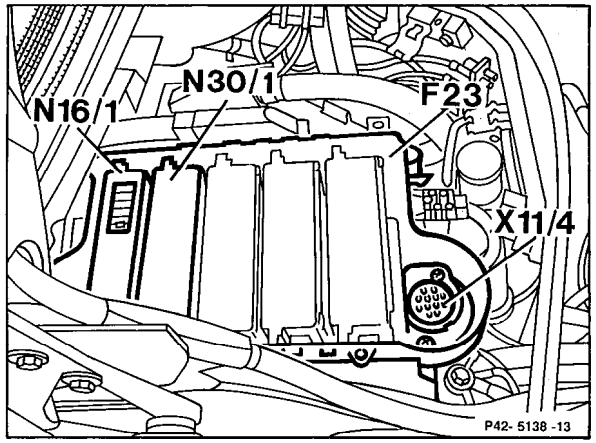
N30/1 ABS/ASR control module

Hydraulic Test Program - Test



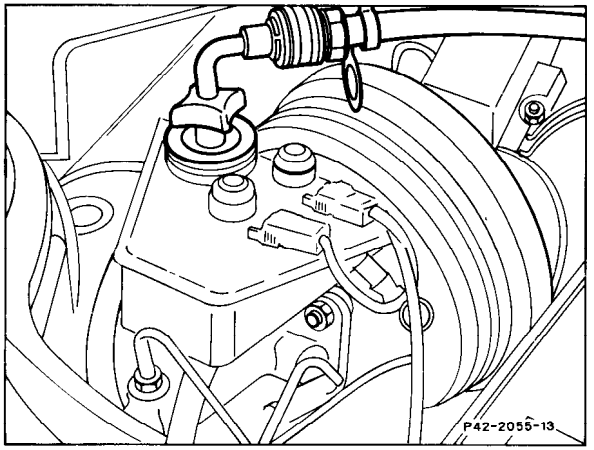
P42-2406-13

Figure 4
Model 140
N30/1 ABS/ASR control module



P42-5138-13

Figure 5
Model 129
N30/1 ABS/ASR control module



P42-2055-13

Figure 6

Connection of brake bleeder to brake fluid reservoir