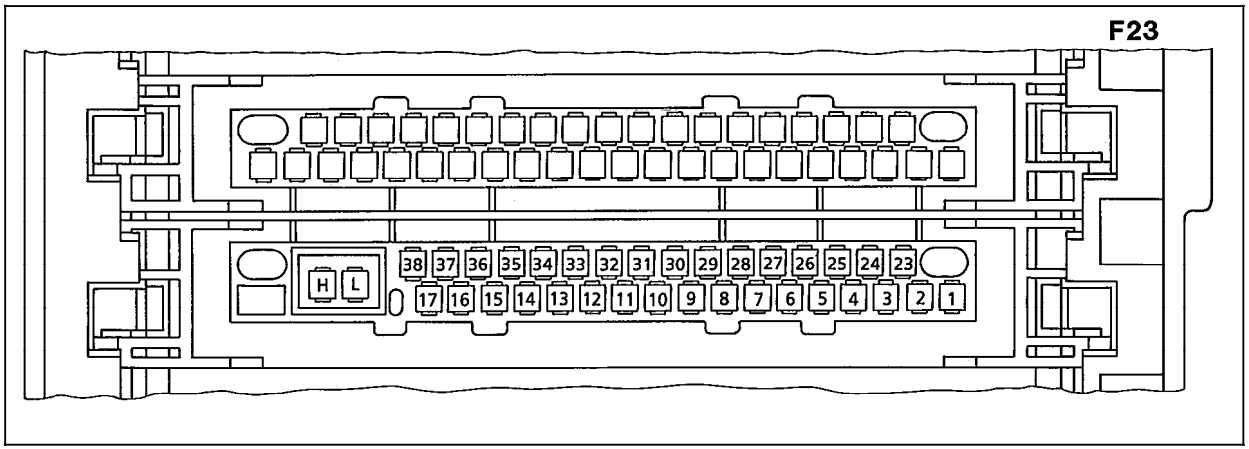
Electrical Test Program - Test

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



P07-5171-53

Figure 16

F23 Module box

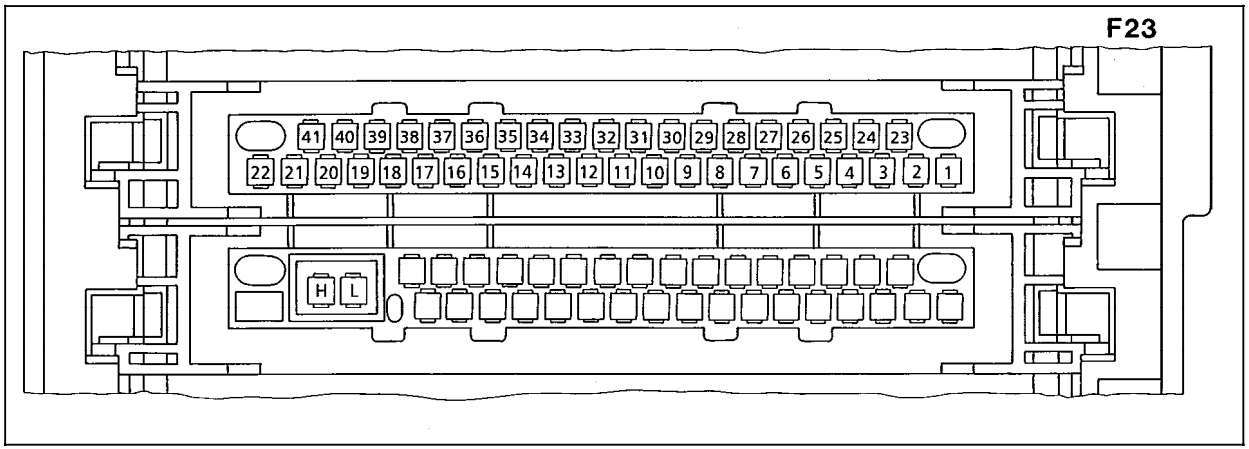
1 **Model 124.036 (02/93 →), 129.076, 140.04/05/07**
ABS lateral acceleration sensor (B24/2)
2 Not used
3 **Model 140.032 (06/93 →)**
VSS sensor output status
4 Stop lamp switch (S9/1), N.C. contact
5 Not used
6 Parking brake switch (S12)
7 Not used
8 Stop lamp switch (S9/1), N.O. contact
9-13 Not used
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 (+)

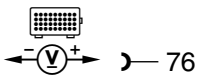
Electrical Test Program - Test

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.

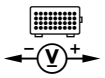
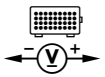
Electrical Test Program - Test

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.

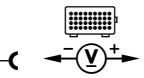
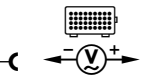
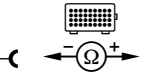
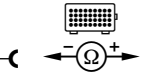
Electrical Test Program - Test

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

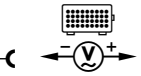
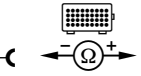
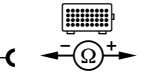
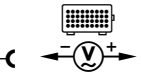
Electrical Test Program - Test

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.

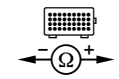
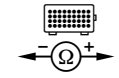
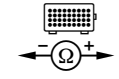
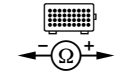
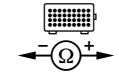
Electrical Test Program - Test

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.

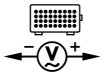
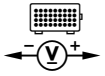
Electrical Test Program - Test

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.

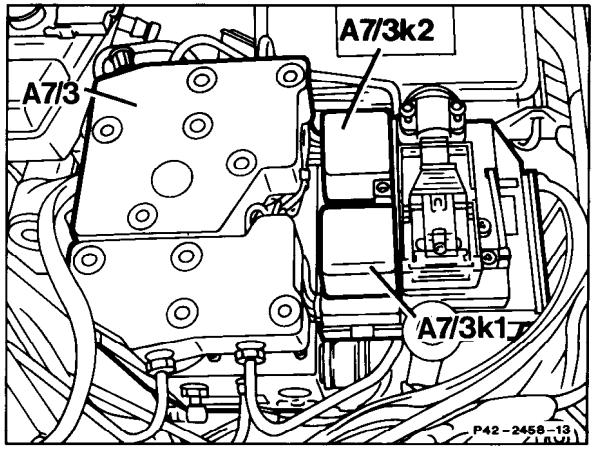
Electrical Test Program - Test

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.

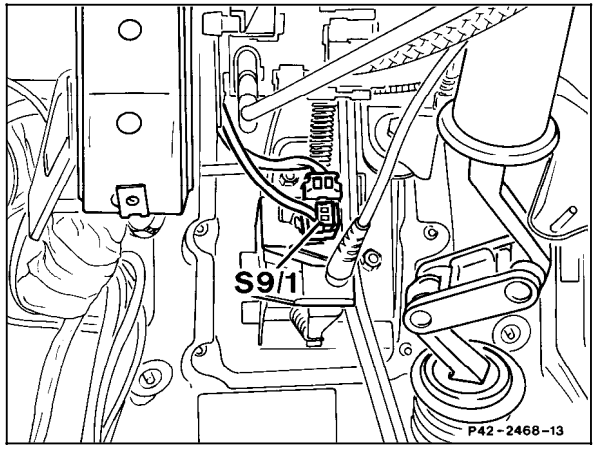
Electrical Test Program - Test



P42-2458-13

Figure 1

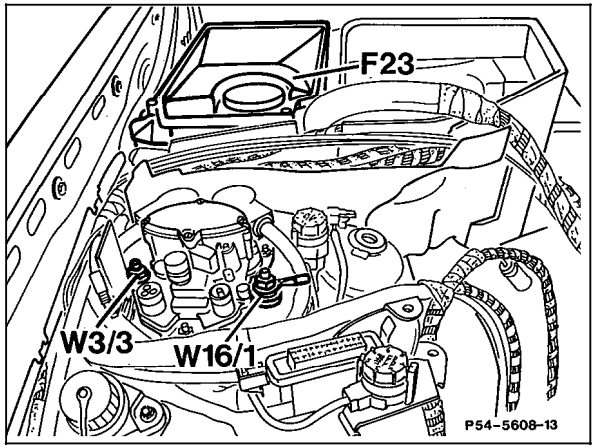
A7/3k1	Solenoid valve relay
A7/3k2	High-pressure/return pump relay



P42-2468-13

Figure 2

S9/1	Stop lamp switch (4-pole)



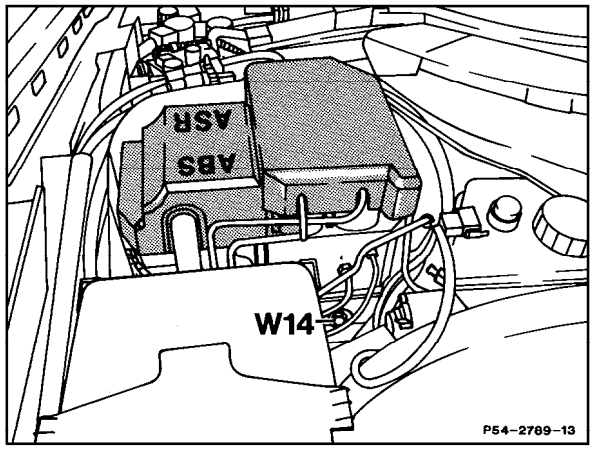
P54-5608-13

Figure 3

Model 140

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

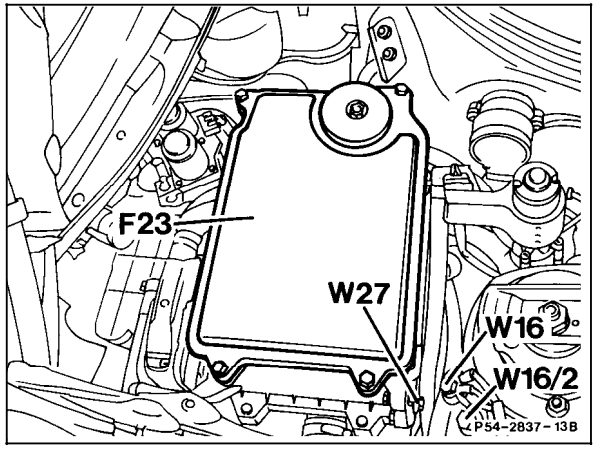
Electrical Test Program - Test



P54-2789-13

Figure 4

W14 Ground (ABS hydraulic unit bracket)

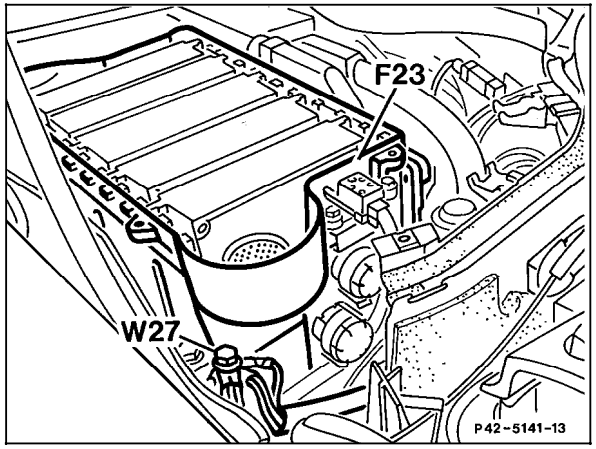


P54-2837-13B

Figure 5

Model 124

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



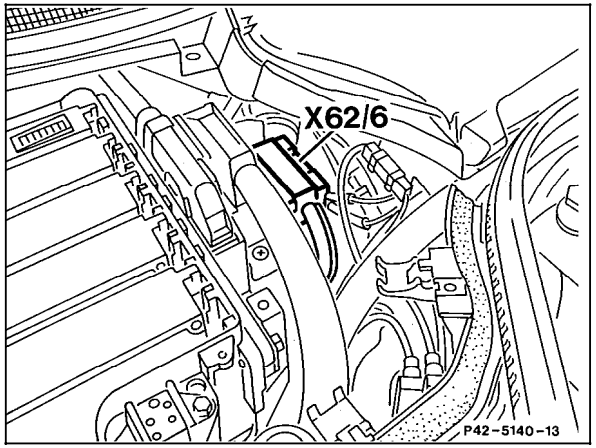
P42-5141-13

Figure 6

Model 129

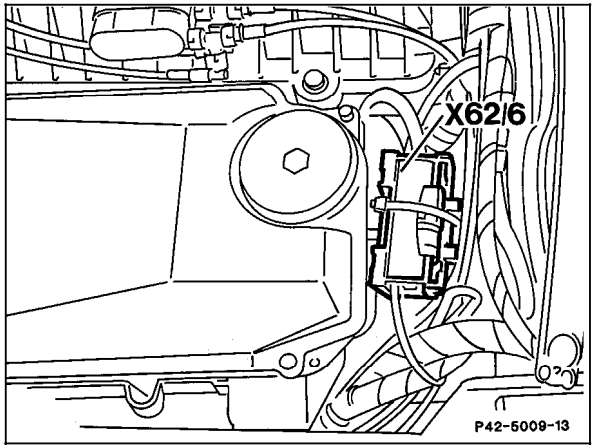
W27 Ground (module box bracket)

Electrical Test Program - Test



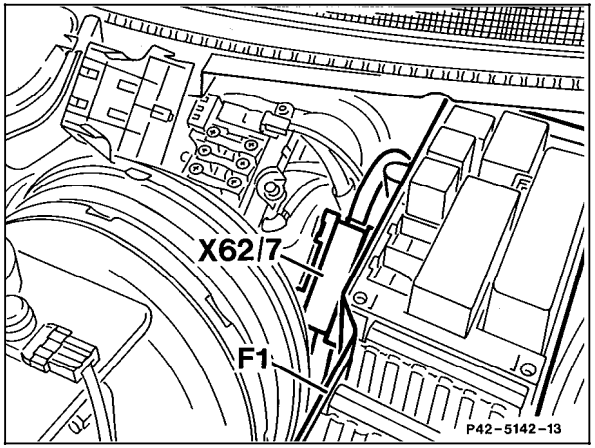
P42-5140-13

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



P42-5009-13

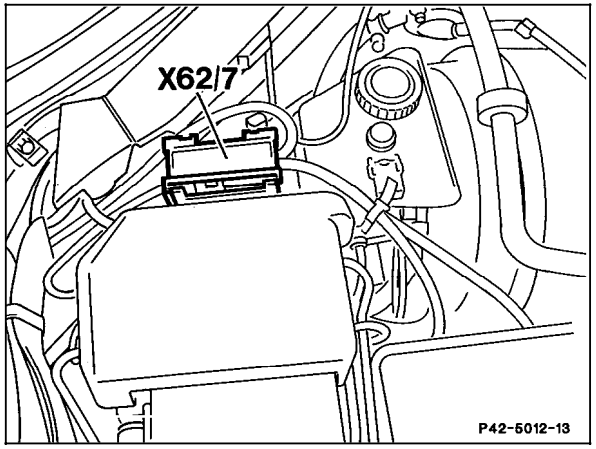
Figure 8
Model 140
X62/6 Right front axle VSS sensor connector (component compartment)



P42-5142-13

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

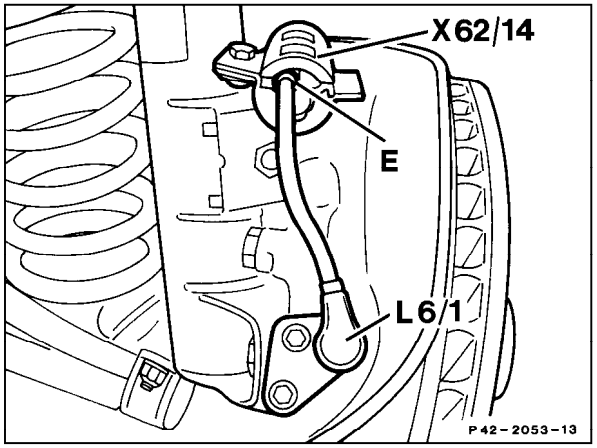
Electrical Test Program - Test



P42-5012-13

Figure 10
Model 140

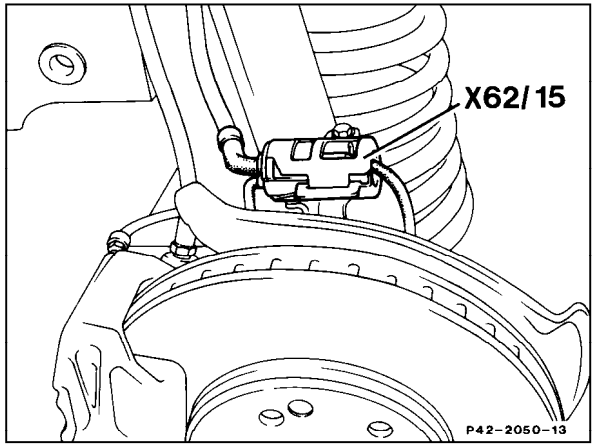
X62/7 Left front axle VSS sensor connector (component compartment)



P42-2053-13

Figure 11
Model 129

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

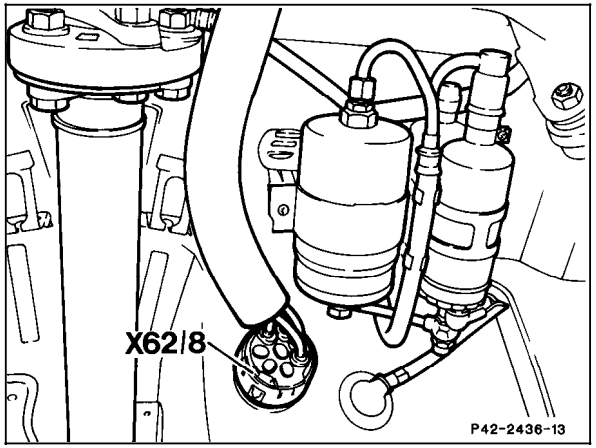


P42-2050-13

Figure 12
Model 129

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

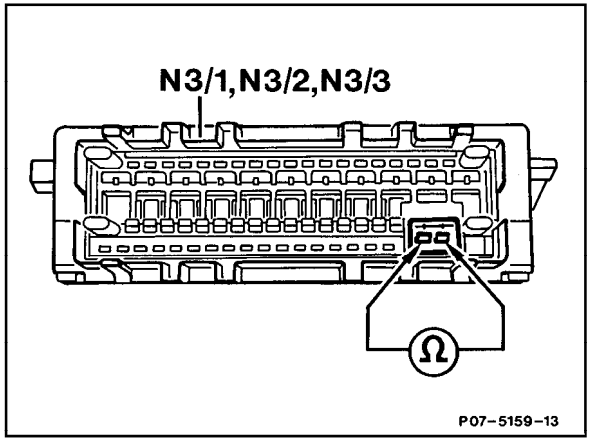
Electrical Test Program - Test



P42-2436-13

Figure 13

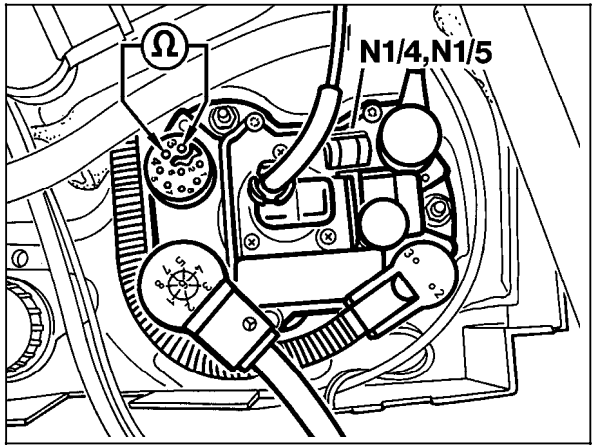
X62/8	Rear axle multiple circuit junction connector



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