



Electrical Test Program – Test




⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	Instrument cluster (A1) Voltage supply Circuit 30		Remove A1. Disconnect connector 1, (Figure 1 and 4).	11 – 14 V	Wiring, ⇒ 1.1
1.1	Voltage supply Circuit 15, unfused		Remove A1. Disconnect connector 1. Ignition: ON	11 – 14 V	Wiring, ⇒ 1.2
1.2	Voltage supply Circuit 15		Remove A1. Disconnect connector 1. Ignition: ON	11 – 14 V	Wiring, A1
2.0	Instrument cluster (A1) Illumination LCD display illumination		Remove A1. Disconnect connector 1 (Figure 1 and 4). Ignition: ON Turn on parking lights.	11 – 14 V	Wiring. Values OK: Bulbs, Bulbs for LCD display, Exterior lamp switch (S1), A1

Electrical Test Program – Test



⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy												
3.0	Fuel level gauge (A1p2) Wiring and contacts	<p style="text-align: center;">B4/1</p> <p>2  3</p> <p style="text-align: center;">B4/2</p> <p>2  3</p>	Ignition: OFF Disconnect connector of left fuel level sensor (B4/1) (21, Figure 5). Jumper connect sockets, then remove connector for right fuel level sensor (B4/2) (21, Figure 5). Connect resistance substitution unit. Ignition: ON Resistance substitution unit setting: <table style="margin-left: auto; margin-right: auto;"> <tr><td style="text-align: right;">8 +6 Ω</td><td style="text-align: left;">≈ 0¹⁾</td></tr> <tr><td style="text-align: right;">27 ± 5.3 Ω</td><td style="text-align: left;">≈ Res.¹⁾</td></tr> <tr><td style="text-align: right;">46.5 ± 10.5 Ω</td><td style="text-align: left;">≈ 1/4</td></tr> <tr><td style="text-align: right;">96 ± 11.7 Ω</td><td style="text-align: left;">≈ 1/2</td></tr> <tr><td style="text-align: right;">145.5 ± 13.2 Ω</td><td style="text-align: left;">≈ 3/4</td></tr> <tr><td style="text-align: right;">189 - 7.8 Ω</td><td style="text-align: left;">≈ 1/1</td></tr> </table>	8 +6 Ω	≈ 0 ¹⁾	27 ± 5.3 Ω	≈ Res. ¹⁾	46.5 ± 10.5 Ω	≈ 1/4	96 ± 11.7 Ω	≈ 1/2	145.5 ± 13.2 Ω	≈ 3/4	189 - 7.8 Ω	≈ 1/1	<p style="text-align: center;">Display in A1p2:</p>	Wiring, Instrument cluster (A1), ⇒ 3.1
8 +6 Ω	≈ 0 ¹⁾																
27 ± 5.3 Ω	≈ Res. ¹⁾																
46.5 ± 10.5 Ω	≈ 1/4																
96 ± 11.7 Ω	≈ 1/2																
145.5 ± 13.2 Ω	≈ 3/4																
189 - 7.8 Ω	≈ 1/1																
[3.0]	Vehicles (as of 03/94) with recalibrated resistance values.		Resistance substitution unit setting: <table style="margin-left: auto; margin-right: auto;"> <tr><td style="text-align: right;">6 +6.6 Ω</td><td style="text-align: left;">≈ 0¹⁾</td></tr> <tr><td style="text-align: right;">24 ± 5.3 Ω</td><td style="text-align: left;">≈ Res.¹⁾</td></tr> <tr><td style="text-align: right;">51 ± 10.5 Ω</td><td style="text-align: left;">≈ 1/4</td></tr> <tr><td style="text-align: right;">100.5 ± 11.7 Ω</td><td style="text-align: left;">≈ 1/2</td></tr> <tr><td style="text-align: right;">145.5 ± 13.2 Ω</td><td style="text-align: left;">≈ 3/4</td></tr> <tr><td style="text-align: right;">189 - 7.8 Ω</td><td style="text-align: left;">≈ 1/1</td></tr> </table>	6 +6.6 Ω	≈ 0 ¹⁾	24 ± 5.3 Ω	≈ Res. ¹⁾	51 ± 10.5 Ω	≈ 1/4	100.5 ± 11.7 Ω	≈ 1/2	145.5 ± 13.2 Ω	≈ 3/4	189 - 7.8 Ω	≈ 1/1	<p style="text-align: center;">Display in A1p2:</p>	
6 +6.6 Ω	≈ 0 ¹⁾																
24 ± 5.3 Ω	≈ Res. ¹⁾																
51 ± 10.5 Ω	≈ 1/4																
100.5 ± 11.7 Ω	≈ 1/2																
145.5 ± 13.2 Ω	≈ 3/4																
189 - 7.8 Ω	≈ 1/1																

¹⁾ Fuel reserve warning lamp illuminates.




Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.1	Left fuel level sensor (B4/1).	2 —  — 3	Disconnect connector at B4/1.	3 (± 1) Ω Empty 97.5 (± 3) Ω Full	B4/1
	Right fuel level sensor (B4/2).	2 —  — 3	Disconnect connector at B4/2.	3 (± 1) Ω Empty 97.5 (± 3) Ω Full	B4/2
4.0	Tachometer (A1p5) Wiring and contacts	W16/6  X11/4 17	Ignition: OFF Disconnect all connectors from N3/4 (21, Figure 4). Connect signal generator and set to a voltage amplitude of approx. 10 V (Figure 6). Ignition: ON	Engine 111 30 Hz ≈ 1000/rpm 130 Hz ≈ 4000/rpm 200 Hz ≈ 6200/rpm Engine 104 50 Hz ≈ 1000/rpm 195 Hz ≈ 4000/rpm 315 Hz ≈ 6400/rpm	Wiring, Instrument cluster (A1). Values OK: N3/4, Engine 104: D.M., Engines, Vol. 2 – 1.1, Engine 111: D.M., Engines, Vol. 2 – 1.2).

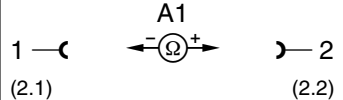

Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.0	Low engine oil level indicator lamp (A1e12, Figure 2) Wiring and contacts	W3  S43 1	Oil level is OK. Disconnect connector from oil level switch (S43). Engine: at Idle	A1e12 does not illuminate.	Wiring, S43, Instrument cluster (A1), ⇒ 5.1
5.1	Wiring and contacts		Engine: at Idle Disconnect connector from S43 (21, Figure 1).	A1e12 illuminates after 60± 10 seconds.	A1e12, Wiring, A1, ⇒ 5.2
5.2		W3  S43 1	Connector unplugged at S43.	0 Ω	S43.

Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
6.0	<p>Electronic speedometer (A1p8) Wiring and contacts</p> <p>Vehicles with ASR or ETS as of 06/94: Left front axle VSS sensor (L6/1) connected to ASR/SPS or ETS/SPS control module (N47-1 or N47-2). See D.M., Chassis and Drivetrain, Vol. 3, 9.2 23</p>	<p>ABS W16/6  N30 ↳ 5 (1.5)</p> <p>ABS/ ASR W16/6  N30/1 ↳ 18 (1.18)</p> <p>ASR/ SPS or ETS/ SPS W16/6  N47-1 N47-2</p>	<p>Ignition: OFF Disconnect connector from ABS control module (N30) or ASR control module (N30/1), ASR/SPS or ETS/SPS control module (N47-1, N47-2) (21, Figure 4).</p> <p>Connect signal generator and set to a voltage amplitude of approx. 10 V (Figure 6). Ignition: ON</p>	<p>With increasing frequency input the vehicle speed indicated must also increase.</p>	<p>Wiring, Instrument cluster (A1).</p> <p>Values OK: N30 or N30/1, D.M., Chassis and Drivetrain, Vol. 2, 5.3 or 6.3 23</p> <p>N47-1 or N47-2 D.M., Chassis and Drivetrain, Vol. 3 – 9.2 23</p>


Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy								
7.0	<p>Outside temperature indicator temperature sensor (B14) (21, Figure 1) Wiring and contacts</p>		<p>Remove A1. Disconnect connector 2 (Figure 4). Measure ambient air temperature at B14, (21, Figure 1).</p>	<p>° F at B14</p> <table border="0"> <tr> <td>- 4 ° F</td> <td>≈ 29 k Ω</td> </tr> <tr> <td>+ 32 ° F</td> <td>≈ 9.8 k Ω</td> </tr> <tr> <td>+ 68 ° F</td> <td>≈ 3.7 k Ω</td> </tr> <tr> <td>+ 104 ° F</td> <td>≈ 1.6 k Ω</td> </tr> </table>	- 4 ° F	≈ 29 k Ω	+ 32 ° F	≈ 9.8 k Ω	+ 68 ° F	≈ 3.7 k Ω	+ 104 ° F	≈ 1.6 k Ω	<p>Wiring, B14</p> <p>Values OK: A1</p>
- 4 ° F	≈ 29 k Ω												
+ 32 ° F	≈ 9.8 k Ω												
+ 68 ° F	≈ 3.7 k Ω												
+ 104 ° F	≈ 1.6 k Ω												
8.0	<p>ECT gauge (A1p1) Wiring and contacts</p>		<p>Separate engine/chassis connector (X26/25) (21, Figure 2) and connect in the resistance substitution unit. Ignition: ON</p>	<p>Display (° C) in A1p1:</p> <table border="0"> <tr> <td>130 Ω</td> <td>≈ 60 °C</td> </tr> <tr> <td>70 Ω</td> <td>≈ 80 °C</td> </tr> <tr> <td>38 Ω</td> <td>≈ 100 °C</td> </tr> <tr> <td>22 Ω</td> <td>≈ 120 °C</td> </tr> </table>	130 Ω	≈ 60 °C	70 Ω	≈ 80 °C	38 Ω	≈ 100 °C	22 Ω	≈ 120 °C	<p>Wiring, A1</p> <p>Values OK: ECT gauge sensor (B13).</p>
130 Ω	≈ 60 °C												
70 Ω	≈ 80 °C												
38 Ω	≈ 100 °C												
22 Ω	≈ 120 °C												



Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
9.0	Low ECL indicator lamp (A1e11, Figure 2) Wiring and contacts		Disconnect connector at ECL switch (S41) (21, Figure 2). Engine: at Idle	A1e11 does not illuminate.	Wiring, A1 Values OK: ECL switch (S41), ⇒ 9.1
9.1	Wiring and contacts	1 S41 —(—)— 2	Disconnect connector at S41 Engine: at Idle	A1e11 illuminates after approx. 5 – 60 sec.	A11e1, Wiring, A1 Values OK: S41
10.0	Low windshield washer fluid level indicator lamp (A1e13, Figure 2) Wiring and contacts		Disconnect connector at windshield washer fluid level switch (S42) (21, Figure 6). Engine: at Idle	A1e13 does not illuminate.	Wiring, A1 Values OK: S42, ⇒ 10.1


Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
10.1	Wiring and contacts	<p style="text-align: center;">S42</p> <p style="text-align: center;">1  2</p>	<p>Disconnect connector at S42.</p> <p>Engine: at Idle</p>	<p>A1e13 illuminates.</p>	<p>A1e13, Wiring, A1</p> <p>Values OK: S42</p>
11.0	<p>Brake pad wear indicator lamp (A1e6, Figure 2)</p> <p>Wiring and contacts</p>		<p>Disconnect connector at left front brake pad wear sensor connector (S10/1x1) (21, Figure 3).</p> <p>Disconnect connector at right front brake pad wear sensor connector (S10/2x1) (21, Figure 3).</p> <p>Engine: at Idle</p>	<p>A1e6 does not illuminate.</p>	<p>Wiring, A1</p> <p>Values OK: S10/1 or S10/2, ⇒ 11.1</p>




Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
11.1	Wiring and contacts	<p>1 S10/1x1 </p> <p>2</p> <p>1 S10/2x1 </p> <p>2</p>	<p>Disconnect connector at S10/1x1. Engine: at Idle</p> <p>Disconnect connector at S10/2x1. Engine: at Idle</p>	<p>A1e6 illuminates.</p> <p>A1e6 illuminates.</p>	<p>Brake pad wear indicator lamp (A1e6), Wiring, A1</p> <p>Values OK: S10/1 or S10/2, Left or right front brake pads.</p>
12.0	<p>Low brake fluid level/ parking brake indicator lamp (A1e7, Figure 2) Wiring and contacts</p>		<p>Disconnect connector at brake fluid level switch (S11, 21, Figure 2) as well as flat pin connector at parking brake switch (S12, 21, Figure 3).</p> <p>Engine: at Idle</p>	<p>A1e7 does not illuminate.</p>	<p>Wiring, ⇒ 12.1</p>




Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
12.1	Wiring and contacts	<p style="text-align: center;">S11</p> <p style="text-align: center;">1  2</p>	<p>Disconnect connector at S11. Engine: at Idle Set parking brake.</p> <p>Connect flat pin connector at S12 (21, Figure 3) Engine: at Idle</p>	<p>A1e7 does not illuminate.</p> <p>A1e7 illuminates.</p>	<p>A1e7, Wiring, A1 Values OK: S11, S12</p>
13.0	<p>Generator charge indicator lamp (A1e5, Figure 3)</p> <p>Wiring and contacts</p>		<p>Disconnect D+ connector at generator (G2). Ignition: ON</p>	<p>A1e5 does not illuminate.</p>	<p>Wiring, A1, ⇒ 13.1</p>
13.1	Wiring and contacts		<p>Disconnect D+ connector at generator (G2), and touch to ground. Ignition: ON</p>	<p>A1e5 illuminates.</p>	<p>A1e5, Wiring, A1 Values OK: Generator (G2).</p>

Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
14.0	SRS MIL (A1e15, Figure 3) Wiring and contacts	W16/6  X11/4 30	Connect socket 30 of 38-pole data link connector (X11/4, Figure 6) to ground in right of component compartment (W16/6, 21, Figure 4). Engine: at Idle	A1e15 illuminates.	A1e15, Wiring, A1 Values OK: D.M., Body and Accessories, Vol. 3 – 16.3
15.0	ABS MIL (A1e17, Figure 3) Wiring and contacts	W16/6  N30 29 (1.29)	Ignition: OFF Disconnect connector at ABS control module (N30, 21, Figure 4). Engine: at Idle	A1e17 illuminates.	A1e17, Wiring, A1. Values OK: D.M., Chassis and Drivetrain, Vol. 2 – 6.3
16.0	ASD MIL (A1e24, Figure 3) Wiring and contacts	W16/6  N30/2 2 (1.2)	Ignition: OFF Disconnect ASD control module (N30/2) from connector (21, Figure 6). Engine: at Idle	A1e24 illuminates.	A1e24, Wiring, A1 Values OK: D.M., Chassis and Drivetrain, Vol. 2 – 4.3

Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
17.0	ASR MIL (A1e22, Figure 3) Wiring and contacts	W16/6  N30/1 10 (1.10)	Ignition: OFF Disconnect connector from ASR control module (N30/1) (21 Figure 4). Engine: at Idle	A1e22 illuminates.	A1e22, Wiring, A1 Values OK: D.M., Chassis and Drivetrain, Vol. 2 – 5.3
18.0	ASD warning lamp (A1e25) Wiring and contacts	W16/6  N30/2 4 (1.4)	Ignition: OFF Disconnect ASD control module (N30/2) from connector (21, Figure 6). Engine: at Idle	A1e25 illuminates.	A1e25, Wiring, A1 Values OK: D.M., Chassis and Drivetrain, Vol. 2 – 4.3
19.0	ASR warning lamp (A1e21) Wiring and contacts	W16/6  N30/1 12 (1.12)	Ignition: OFF Disconnect connector from ASR control module (N30/1) (21, Figure 4). Engine: at Idle	A1e21 illuminates.	A1e21, Wiring, A1 Values OK: D.M., Chassis and Drivetrain, Vol. 2 – 5.3

Electrical Test Program – Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
20.0	<p>“CHECK ENGINE” MIL (A1e26, Figure 2) Wiring and contacts</p>		<p>Ignition: OFF Disconnect connector from diagnostic module (N59/1) (21, Figure 6). Engine: at Idle</p>	<p>A1e26 does not illuminate.</p>	<p>Wiring, ⇒ 20.1</p>
20.1	<p>Wiring and contacts</p>	<p>2 N59/1 -(← →)- 9</p>	<p>Ignition: OFF Disconnect connector from N59/1 (Install bridge, Figure 5). Engine: at Idle</p>	<p>A1e26 illuminates.</p>	<p>Wiring, A1, Diagnostic module (N59/1). Values OK: D.M., Engines, Vol. 3 – 8.5</p>

Electrical Test Program – Test

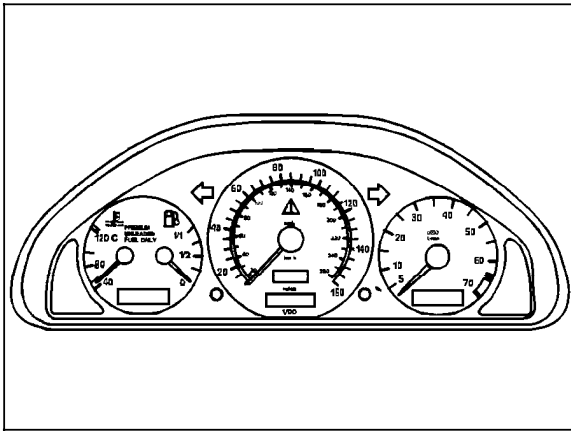


Figure 1

A1 Instrument cluster

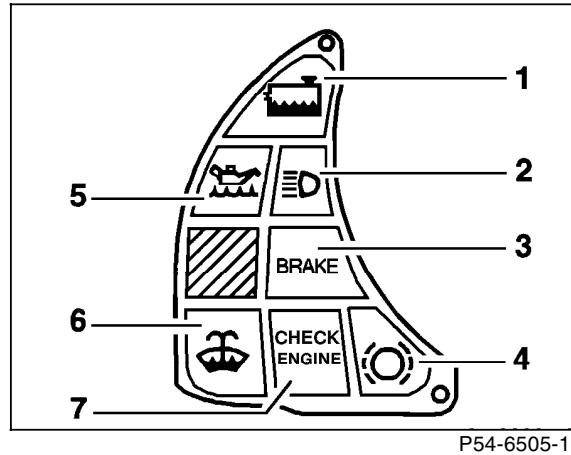


Figure 2

Indicator/warning lamps (left)

- 1 Low ECL indicator lamp
- 2 High beam indicator lamp
- 3 Low brake fluid level and parking brake indicator lamp
- 4 Brake pad wear indicator lamp
- 5 Low engine oil level indicator lamp
- 6 Low windshield washer fluid level indicator lamp
- 7 "CHECK ENGINE " MIL

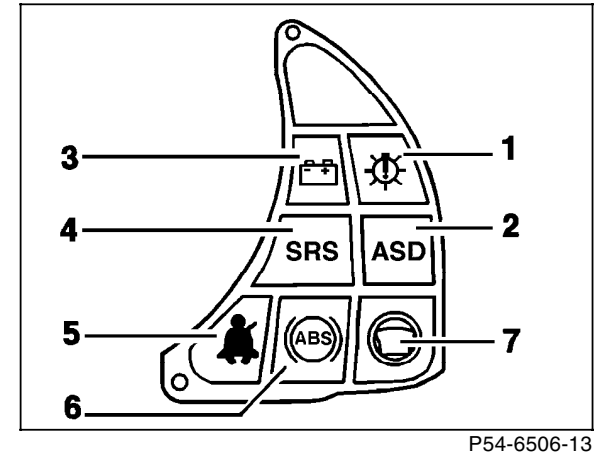
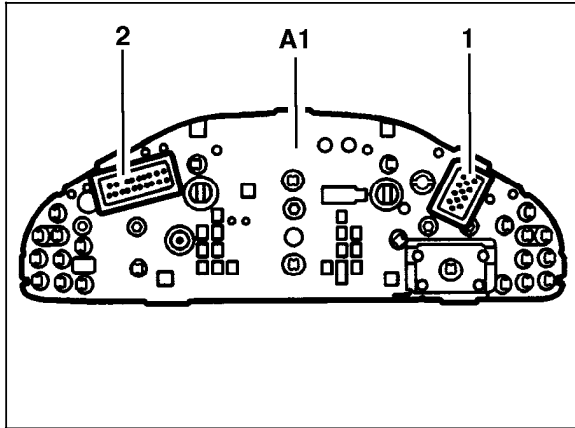


Figure 3

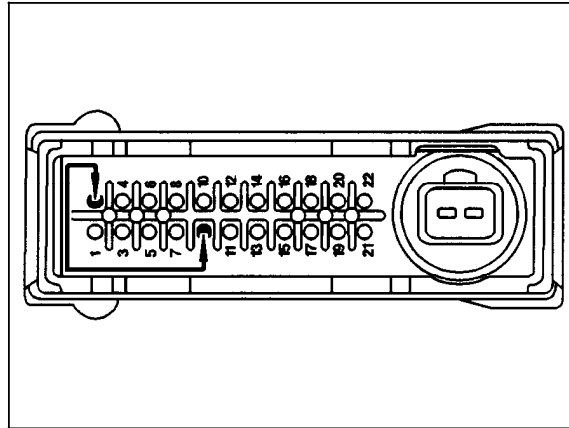
Indicator/warning lamps (right)

- 1 Exterior lamp failure indicator lamp
- 2 ASD or ASR MIL
- 3 Generator charge indicator lamp
- 4 SRS MIL
- 5 Safety belt reminder lamp
- 6 ABS MIL

Electrical Test Program – Test



P54-6089-13



P54-6553-13

Figure 4

Figure 5

- A1 Instrument cluster
- 1 Connector (24-pole)
- 2 Connector (21-pole)

N59/1 Diagnostic module (OBD II)

Electrical Test Program – Test

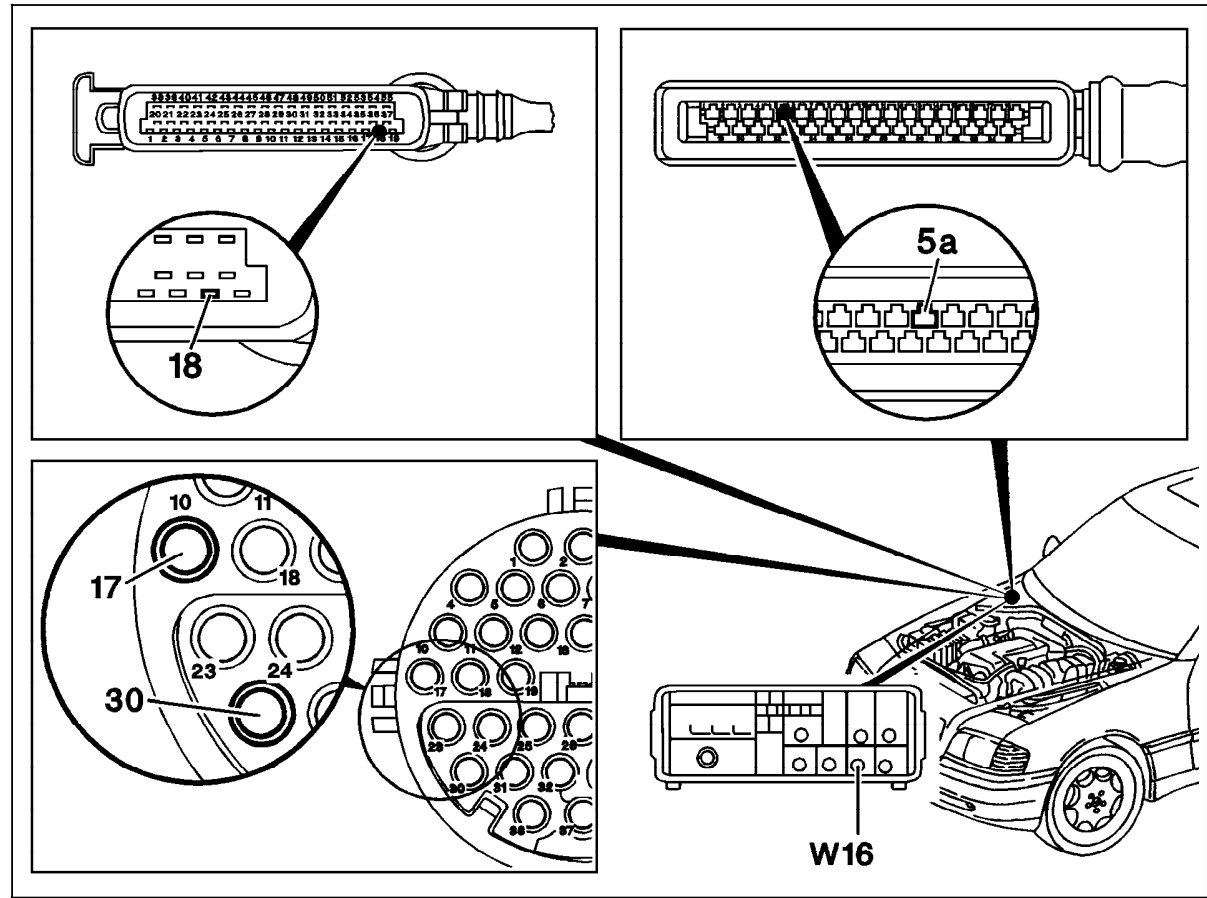


Figure 6

- 5a ABS control module connector, socket 5
- 17 Data link connector, 38-pole (X11/4), socket 17
- 18 ASR control module connector, socket 18
- 30 Data link connector, 38-pole (X11/4), socket 30

P54-6692-57