
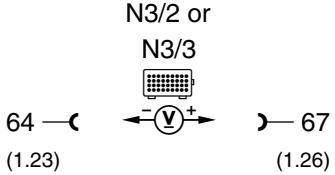
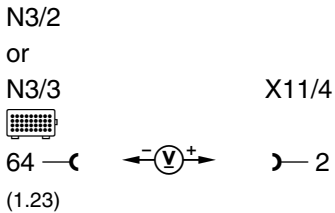
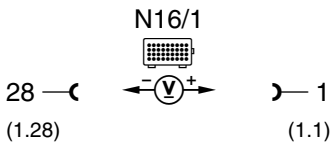



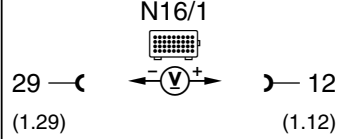


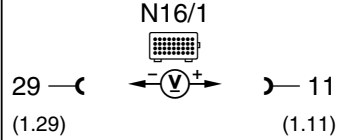
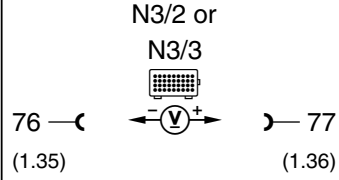






Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		LH-SFI control module (N3/2 or N3/3) Voltage supply Circuit 30	 64 — (1.23) 67 — (1.26)	Ignition: ON	11 – 14 V	⇒ 1.1 – 1.4
1.1		Ground connection	 64 — (1.23) 2 —	Ignition: ON	11 – 14 V	Wiring, Model 129 Ground (module box bracket) (W27, Figure 3) Model 140 Ground (electronics output ground - right footwell) (W15, Figure 13).
1.2		Base module (N16/1) Voltage supply Circuit 30	 28 — (1.28) 1 — (1.1)	Ignition: OFF Connect socket box to N16/1. Ignition: ON	11 – 14 V	Wire to terminal block (X4/10) (Figures 1 – 2).


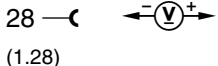
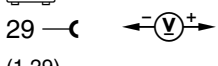


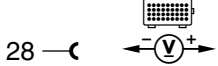


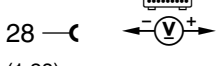
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.3		 <p>DTC readout from base module (N16/1) Voltage supply from N16/1 to right LH-SFI control module (N3/3) Circuit 30</p>	<p>N16/1</p> 	Ignition: ON	11 – 14 V	N16/1.
1.4		 <p>DTC readout from base module (N16/1) Voltage supply from N16/1 to left LH-SFI control module (N3/2) Circuit 30</p>	<p>N16/1</p> 	Ignition: ON	11 – 14 V	N16/1.
2.0		<p>LH-SFI control module (N3/2 or N3/3) Voltage supply Circuit 87/M1e</p>	<p>N3/2 or N3/3</p> 	Ignition: ON	11 – 14 V	⇒ 2.1 – 2.6


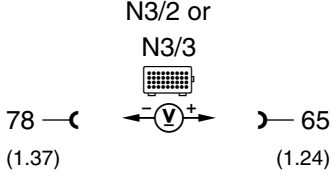
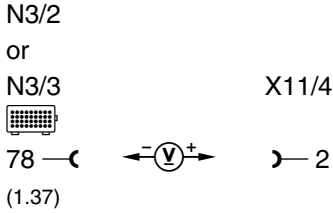

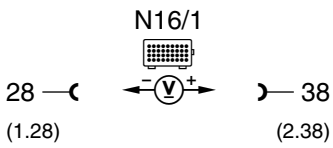
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.1		Ground, electronics (W15/1) (right footwell)	N3/2 or N3/3  76 — ♂ ♂ — 2 (1.35)	Ignition: ON	11 – 14 V	W15/1.
2.2		Base module (N16/1) Voltage supply Circuit 15 unfused	N16/1  28 — ♂ ♂ — 34 (1.28) (1.34)	Connect socket box to N16/1. Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Wiring, Ignition/starter switch (S2/1), Wiring, Ignition/starter switch (S2/1).
2.3		Base module (N16/1) Voltage supply Circuit 15	N16/1  28 — ♂ ♂ — 15 (1.28) (1.15)	Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Wiring, Fuse.




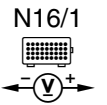
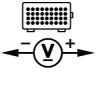
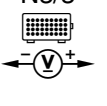
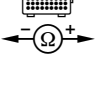
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.4		Output ground, base module (N16/1)	<p>N16/1 X11/4</p> <p></p> <p>28 — 2 (1.28)</p> <p>and</p> <p>N16/1 X11/4</p> <p></p> <p>29 — 2 (1.29)</p>	Ignition: ON	11 – 14 V	Ground wire W15/1.
2.5		<p> DTC readout from base module (N16/1) Voltage supply (fused) for right LH-SFI control module (N3/3)</p>	<p>N16/1</p> <p></p> <p>28 — 7 (1.28) (1.7)</p>	Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Fuse (F2) at N16/1, N16/1.
2.6		<p> DTC readout from base module (N16/1) Voltage supply (fused) for left LH-SFI control module (N3/2)</p>	<p>N16/1</p> <p></p> <p>28 — 26 (1.28) (1.26)</p>	Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Fuse (F4) at N16/1, N16/1.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.0		LH-SFI control module (N3/2 or N3/3) Voltage supply Circuit 87	<p>N3/2 or N3/3</p> 	Ignition: ON	11 – 14 V	Wiring, ⇒ 3.1.
3.1		Ground output (W15) (right footwell)	<p>N3/2 or N3/3</p> 	Ignition: ON	11 – 14 V	Ground, output (W15, right footwell).
4.0		DTC readout from base module (N16/1) Voltage supply for right bank injectors (Y64)	<p>N16/1</p> 	Connect socket box to N16/1. Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Fuse (F2) at N16/1.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.0		 DTC readout from base module (N16/1) Voltage supply for left bank injectors (Y63)	N16/1  28 — ♂ (1.28) ♀ — 18 (2.18)	Connect socket box to N16/1. Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Fuse (F4) at N16/1, N16/1.
6.0	4 ²⁾	Hot wire MAF sensor (B2/3 or B2/4) Voltage at hot wire	N3/2 or N3/3  34 — ♂ (2.34) ♀ — 17 (2.17)	Ignition: ON Engine: at Idle	1.0 – 1.2 V 1.3 – 1.7 V ¹⁾	Wiring, ⇒ 6.1, ⇒ 7.0, B2/3 or B2/4.
6.1		Hot wire MAF sensor (B2/3 or B2/4) Voltage supply	N3/2 or N3/3  64 — ♂ (1.23) ♀ — 23 (2.23)	Ignition: ON	11 – 14 V	LH-SFI control module (N3/2 or N3/3), ⇒ 7.0
7.0	4 ²⁾	Ground wire for hot wire MAF sensor (B2/3 or B2/4)	N3/2 or N3/3  34 — ♂ (2.34) ♀ — 76 (1.35)	Ignition: OFF	< 6 Ω	Ground wire (W16) (front spring tower).



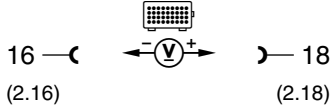
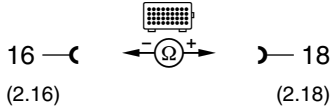
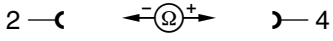
1) Voltage increases with increasing rpm.

2) The DTC "4" can be displayed on vehicles up to 7/91 even if no fault exists.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
8.0		Hot wire MAF sensor (B2/3 or B2/4) Burn-off control	<p>N3/2 or N3/3</p>	<p>Ignition: OFF</p> <p>Unplug N3/2 or N3/3, wait for approx. 5 sec. and then plug back in again.</p> <p>Engine: Start</p> <p>Engine coolant temperature > 60 °C.</p> <p>Engine speed > 2000 rpm for 15 seconds.</p> <p>Turn off engine.</p>	<p>After approx. 4 sec., 3 – 5 V for approx. 1 sec.</p> <p>Simultaneous visual check: hot-wire glows briefly</p>	<p>Wiring, B2/3 or B2/4, LH-SFI control module (N3/2 or N3/3).</p>
9.0		FP relay module (K27/1 or K27/2) Control	<p>N3/2 or N3/3</p>	<p>Engine: Start</p>	<p>11 – 14 V while cranking.</p>	<p>⇒ 9.1, N3/2 or N3/3.</p>
9.1		Starter signal circuit 50	<p>N3/2 or N3/3</p>	<p>Engine: Start</p>	<p>11 – 14 V while cranking.</p>	<p>Wiring.</p>



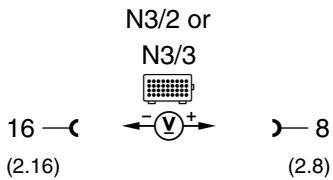
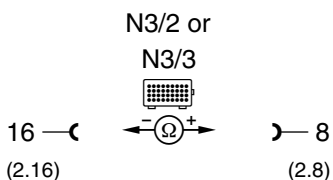
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy																																	
10.0		ECT sensor (B11/9 or B11/10) Voltage at sensor circuit 1	<p>N3/2 or N3/3</p> 	Ignition: ON	<table border="1"> <thead> <tr> <th>°C</th> <th>V</th> <th>Ω</th> </tr> </thead> <tbody> <tr><td>20</td><td>3.5</td><td>2500</td></tr> <tr><td>30</td><td>3.1</td><td>1700</td></tr> <tr><td>40</td><td>2.7</td><td>1170</td></tr> <tr><td>50</td><td>2.3</td><td>830</td></tr> <tr><td>60</td><td>1.9</td><td>600</td></tr> <tr><td>70</td><td>1.5</td><td>435</td></tr> <tr><td>80</td><td>1.2</td><td>325</td></tr> <tr><td>90</td><td>1.0</td><td>245</td></tr> <tr><td>100</td><td>0.8</td><td>185</td></tr> <tr><td colspan="2" style="text-align: center;">± 5%</td><td style="text-align: center;">± 5%</td></tr> </tbody> </table>	°C	V	Ω	20	3.5	2500	30	3.1	1700	40	2.7	1170	50	2.3	830	60	1.9	600	70	1.5	435	80	1.2	325	90	1.0	245	100	0.8	185	± 5%		± 5%	⇒ 10.1, LH-SFI control module (N3/2 or N3/3).
°C	V	Ω																																					
20	3.5	2500																																					
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90	1.0	245																																					
100	0.8	185																																					
± 5%		± 5%																																					
10.1		Resistance Sensor circuit 1	<p>N3/2 or N3/3</p> 	Ignition: OFF Disconnect N3/2 or N3/3 from contact box (070).	Nominal values, see ⇒ 10.0	Wiring, ⇒ 10.2																																	
10.2		Resistance ECT sensor (B11/9 or B11/10) Sensor circuit 1	<p>B11/9 or B11/10</p> 	Connector on B11/9 or B11/10 unplugged.	Nominal values, see ⇒ 10.0, Connection see Figure 20.	B11/9 or B11/10.																																	






Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy																																	
11.0		ECT sensor (B11/9 or B11/10) Voltage at sensor circuit 2	<p>N3/2 or N3/3</p>	Ignition: ON	<table border="1"> <thead> <tr> <th>°C</th> <th>V</th> <th>Ω</th> </tr> </thead> <tbody> <tr><td>20</td><td>3.5</td><td>2500</td></tr> <tr><td>30</td><td>3.1</td><td>1700</td></tr> <tr><td>40</td><td>2.7</td><td>1170</td></tr> <tr><td>50</td><td>2.3</td><td>830</td></tr> <tr><td>60</td><td>1.9</td><td>600</td></tr> <tr><td>70</td><td>1.5</td><td>435</td></tr> <tr><td>80</td><td>1.2</td><td>325</td></tr> <tr><td>90</td><td>1.0</td><td>245</td></tr> <tr><td>100</td><td>0.8</td><td>185</td></tr> <tr><td></td><td>± 5%</td><td>± 5%</td></tr> </tbody> </table>	°C	V	Ω	20	3.5	2500	30	3.1	1700	40	2.7	1170	50	2.3	830	60	1.9	600	70	1.5	435	80	1.2	325	90	1.0	245	100	0.8	185		± 5%	± 5%	Wiring, ⇒ 11.1, LH-SFI control module (N3/2 or N3/3).
°C	V	Ω																																					
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100	0.8	185																																					
	± 5%	± 5%																																					
11.1		Resistance Sensor circuit 2	<p>N3/2 or N3/3</p>	Ignition: OFF Disconnect N3/2 or N3/3 from contact box (070).	Nominal values, see ⇒ 11.0	Wiring, ⇒ 11.2																																	
11.2		Resistance ECT sensor (B11/9) or (B11/10) Sensor circuit 2	<p>B11/9 or B11/10</p>	Connector on B11/9 or B11/10 unplugged.	Nominal values, see ⇒ 11.0, Connection see Figure 20.	B11/9 or B11/10.																																	

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy																														
12.0		IAT sensor (B17/5 or B17/6) Voltage	<p>N3/2 or N3/3</p> 	Ignition: ON	<table border="1"> <thead> <tr> <th>°C</th> <th>V</th> <th>Ω</th> </tr> </thead> <tbody> <tr><td>10</td><td>1.8</td><td>3700</td></tr> <tr><td>20</td><td>1.5</td><td>2500</td></tr> <tr><td>30</td><td>1.2</td><td>1700</td></tr> <tr><td>40</td><td>0.9</td><td>1170</td></tr> <tr><td>50</td><td>0.6</td><td>830</td></tr> <tr><td>60</td><td>0.5</td><td>600</td></tr> <tr><td>70</td><td>0.4</td><td>435</td></tr> <tr><td>80</td><td>0.3</td><td>325</td></tr> <tr><td></td><td>± 5%</td><td>± 5%</td></tr> </tbody> </table>	°C	V	Ω	10	1.8	3700	20	1.5	2500	30	1.2	1700	40	0.9	1170	50	0.6	830	60	0.5	600	70	0.4	435	80	0.3	325		± 5%	± 5%	⇒ 12.1, LH-SFI control module (N3/2 or N3/3).
°C	V	Ω																																		
10	1.8	3700																																		
20	1.5	2500																																		
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60	0.5	600																																		
70	0.4	435																																		
80	0.3	325																																		
	± 5%	± 5%																																		
12.1		Resistance	<p>N3/2 or N3/3</p> 	Ignition: OFF Disconnect N3/2 or N3/3 from socket box.	Nominal values, see ⇒ 12.0	Wiring, B17/5 or B17/6.																														

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
13.0		TN-signal (rpm signal) – input from DI control module (N1/4 or N1/5)	<p>N3/2 or N3/3 ¹⁾</p>  <p>76 — 5 (1.35) (2.5)</p> <p>N3/2 or N3/3 ²⁾</p>  <p>76 — 5 (1.35) (2.5)</p>	Engine: Start Engine: at Idle	Signal, see Figure 17. 5 – 7.5 V	Wiring, DI control module (N1/4 or N1/5), LH-SFI control module (N3/2 or N3/3).
14.0		TN-signal (rpm signal) – output Right LH-SFI control module (N3/3)	<p>N3/3</p>  <p>76 — 69 (1.35) (1.28)</p>	Engine: Start Engine: at Idle	5 – 7.5 V	Wiring, N3/3, Base module (N16/1).

¹⁾ Test with oscilloscope.

²⁾ Test with multimeter only if oscilloscope is not available.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
15.0		CMP sensor (L5/2 or L5/3) signal from DI control module (N1/4 or N1/5)	<p>N3/2 or N3/3 ¹⁾</p> <p>77 — 6 (1.36) (2.6)</p> <p>N3/2 or N3/3 ²⁾</p> <p>77 — 6 (1.36) (2.6)</p>	<p>Engine: Start</p> <p>Engine: at Idle</p>	<p>Signal, see Figure 16.</p> <p>0.8 – 1.8 V</p>	<p>Wiring, L5/2 or L5/3 (Test, see DM, Engines, Vol. 2, section 5.2), N1/4 or N1/5.</p>
16.0		CTP (idle) recognition signal from EA/CC/ISC actuator (M16/3 or M16/4)	<p>N3/2 or N3/3</p> <p>76 — 52 (1.35) (1.11)</p>	<p>Ignition: ON</p> <p>Accelerator pedal in CTP (idle)</p> <p>Accelerator pedal in WOT (full throttle)</p>	<p>4.8 V</p> <p>5.5 V</p>	<p>Wiring, M16/3 or M16/4 (Test see DM, Engines, Vol. 3, section 6.2), EA/CC/ISC control module (N4/1).</p>
17.0		Fuel safety shut-off from EA/CC/ISC actuator (M16/3 or M16/4)	<p>N3/2 or N3/3</p> <p>76 — 71 (1.35) (1.30)</p>	<p>Ignition: ON</p>	<p>2.2 – 11 V (Fluctuates on an even rhythmic cycle).</p>	<p>Wiring M16/3 or M16/4 (Test, see DM, Engines, Vol. 3, section 6), N4/1.</p>

¹⁾ Test with oscilloscope.



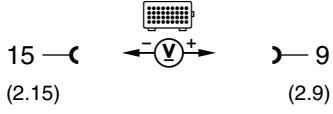
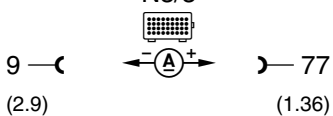

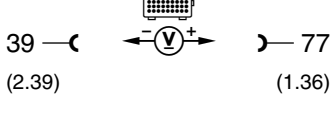
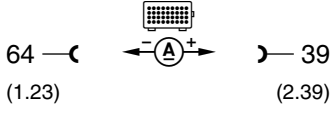
²⁾ Test with multimeter only if oscilloscope is not available.

⁶⁾ The DTC "iD" can be displayed on vehicles up to 7/91 even if no fault exists.

Electrical Test Program – Test



⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
18.0		Fuel safety shut-off	<p>N3/2 or N3/3</p> <p>76 (1.35) 71 (1.30)</p>	Engine: Start and apply WOT (full throttle).	Engine speed surges between 1200 – 1600 rpm.	LH-SFI control module (N3/2 or N3/3).
19.0		O2S 1 (before TWC) (G3/3 or G3/4) Signal	<p>N3/2 or N3/3</p> <p>15 —(15 (2.15) 14 (2.14)</p>	Engine: at Idle and at operating temperature > 80 °C let engine run for a minimum of 2 minutes.	Oscillates between –0.2 and +1.0 V by more than 0.3 V	Wiring, G3/3 or G3/4, ⇒ 19.1, ⇒ 19.2, ⇒ 20.0.
19.1		Insulation, O2S 1 wire	<p>N3/2 or N3/3</p> <p>13 —(13 (2.13) 14 (2.14)</p>	Ignition: OFF Disconnect N3/2 or N3/3 from contact box (070).	∞ Ω	Wiring.
19.2		O2S 1 control from LH-SFI control module (N3/2 or N3/3)	<p>N3/2 or N3/3</p> <p>14 (2.14) 76 (1.35)</p>	On-off ratio tester connected. Engine: at Idle and at operating temperature > 80 °C	90 – 100% at on-off ratio tester	N3/2 or N3/3.

Electrical Test Program – Test


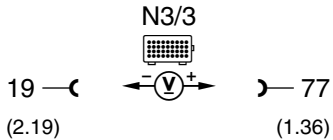
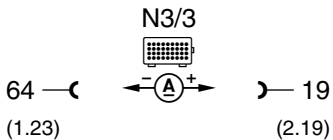
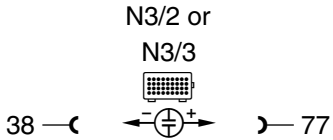
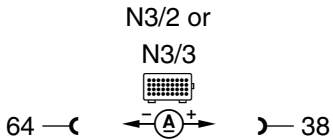
⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
20.0		O2S 1 (before TWC) heater (G3/3 or G3/4) Control signal	N3/2 or N3/3 	Engine: at Idle Engine coolant temperature > 80 °C	11 – 14 V	⇒ 20.1, LH-SFI control module (N3/2 or N3/3).
20.1		O2S 1 (before TWC) heater Current draw	N3/2 or N3/3 	Disconnect N3/2 or N3/3 from contact box (070). Ignition: ON	0.6 – 3.4 A	Wiring, G3/3 or G3/4.
21.0		EGR switchover valve (Y27/2 or Y27/3) Control signal	N3/2 or N3/3 	Engine: at Idle Engine coolant temperature > 60 °C Accelerate briefly	11 – 14 V	⇒ 22.0 – 23.0, Wiring, N3/2 or N3/3.
21.1		Current draw	N3/2 or N3/3 	Disconnect N3/2 or N3/3 from contact box (070). Ignition: ON	0.3 – 0.5 A	Wiring, Y27/2 or Y27/3.

6) The DTC "1B" can be displayed on vehicles up to 7/91 even if no fault exists.

Electrical Test Program – Test





⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
22.0		EGR switchover valve (Y27/2 or Y27/3) Vacuum control	35 —  — 10	Test connection note: Connect vacuum tester to EGR valve with Y-fitting. N3/2 or N3/3 plugged in. Engine: at Idle Engine coolant temperature > 60 °C. Accelerate briefly.	> 400 mbar	Vacuum lines, EGR valve, Y27/2 or Y27/3.
23.0		Left or right EGR valve Mechanical test		Test connection note: Connect vacuum tester directly to left or right EGR valve. Using vacuum tester, apply 500 mbar vacuum. Disconnect vacuum line on EGR valve	Left or right EGR valve closes audibly.	EGR valve.

Electrical Test Program – Test



⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
24.0	1)	Right cylinder bank only AIR relay module (K17) Control signal		Unplug right ECT sensor (B11/10) and simulate 2.5 kΩ at sockets 2 and 4 with resistance substitution unit. Engine: at Idle	11 – 14 V for approx. 2 minutes after start and AIR pump runs.	⇒ 24.1, N3/3.
24.1		AIR relay module (K17) Current draw		Disconnect right LH-SFI control module (N3/3) from contact module (072). Ignition: ON	0.1 – 0.3 A	Wiring, K17.
25.0	23	Purge control valve (Y58/2 or Y58/3) Control signal		Engine: at Idle and at operating temperature.	After approx. 1 minute, purge control valve Y58/2 or Y58/3, (Figure 14 and 15) must cycle noticeable. Signal, see Figure 26.	⇒ 25.1, ⇒ 26.0. LH-SFI control module (N3/2 or N3/3).
25.1		Current draw		Disconnect N3/2 or N3/3 from contact module (072). Ignition: ON	0.2 – 0.4 A	Wiring, Y58/2 or Y58/3.

1) The DTC "I1" can be displayed on vehicles up to 7/91 even if no fault exists.





















Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
26.0		Purge control valve (Y58/2 or Y58/3) Vacuum control		Test connection note: Connect vacuum tester to Y58/2 or Y58/3 (Figure 14 and 15), connection (B). Engine: at Idle and at operating temperature. Increase engine speed slowly to max. 3000 rpm.	After approx. 1 minute, > 400 mbar	Vacuum lines, ⇒ 25.0, Y58/2 or Y58/3.
27.0		Left or right adjustable camshaft timing solenoid (Y49/1 or Y49/2) Current draw	1 —  — 2 Y49/1 or Y49/2	Test connection note: Connect test cable (102 589 04 63 00) to solenoid. Engine: Start and raise engine speed to approx. 3000 rpm	Briefly approx. 1.5 A, then 1 A	⇒ 27.1, ⇒ 28.0, N3/2 or N3/3.
27.1		Resistance	41 —  — 77 (2.41) (1.36) N3/2 or N3/3	Disconnect LH-SFI control module (N3/2 or N3/3) from contact box (070).	4 – 6 Ω	Wiring, Y49/1 or Y49/2.




Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
28.0		Left or right adjustable camshaft timing solenoid (Y49/1 or Y49/2) Mechanical operation	N3/2 or N3/3  41 —()— (2.41) —()— 76 (1.35)	Engine: at Idle Bridge socket box sockets for maximum of 10 seconds.	Engine runs unevenly after approx. 5 sec.	⇒ 27.0 Mechanical camshaft adjustment (see SMS, Job No. 05-216).
29.0	E	<i>Non-USA vehicles only. Continue to next test step.</i>				
30.0	2B	<i>Non-USA vehicles only. Continue to next test step.</i>				

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy																																																												
31.0	27	Injectors (Y63 or Y64) Resistance and assignment <table style="margin-left: 40px;"> <tr> <td></td> <td>(N3/3)</td> <td></td> <td>(N3/2)</td> </tr> <tr> <td></td> <td>right</td> <td></td> <td>left</td> </tr> <tr> <td></td> <td>cylinder</td> <td></td> <td>cylinder</td> </tr> <tr> <td></td> <td>bank</td> <td></td> <td>bank</td> </tr> </table>		(N3/3)		(N3/2)		right		left		cylinder		cylinder		bank		bank	N3/2 or N3/3 	Test connection note: Connect ohmmeter to socket box for each subsequent injector. Disconnect N3/2 or N3/3 from contact box (070).	14 – 16 Ω ∞ Ω	Wiring, Y63 or Y64, Wires reversed.																																												
	(N3/3)		(N3/2)																																																															
	right		left																																																															
	cylinder		cylinder																																																															
	bank		bank																																																															
		<table style="margin-left: 40px;"> <tr> <td>Cyl.</td> <td>1</td> <td>/</td> <td>12</td> </tr> <tr> <td>Cyl.</td> <td>2</td> <td>/</td> <td>11</td> </tr> <tr> <td>Cyl.</td> <td>3</td> <td>/</td> <td>10</td> </tr> <tr> <td>Cyl.</td> <td>4</td> <td>/</td> <td>9</td> </tr> <tr> <td>Cyl.</td> <td>5</td> <td>/</td> <td>8</td> </tr> <tr> <td>Cyl.</td> <td>6</td> <td>/</td> <td>7</td> </tr> </table>	Cyl.	1	/	12	Cyl.	2	/	11	Cyl.	3	/	10	Cyl.	4	/	9	Cyl.	5	/	8	Cyl.	6	/	7	<table style="margin-left: 40px;"> <tr> <td>27 —</td> <td></td> <td>77</td> </tr> <tr> <td>(2.27)</td> <td></td> <td>(1.36)</td> </tr> <tr> <td>25 —</td> <td></td> <td>77</td> </tr> <tr> <td>(2.25)</td> <td></td> <td>(1.36)</td> </tr> <tr> <td>26 —</td> <td></td> <td>77</td> </tr> <tr> <td>(2.26)</td> <td></td> <td>(1.36)</td> </tr> <tr> <td>2 —</td> <td></td> <td>77</td> </tr> <tr> <td>(2.2)</td> <td></td> <td>(1.36)</td> </tr> <tr> <td>4 —</td> <td></td> <td>77</td> </tr> <tr> <td>(2.4)</td> <td></td> <td>(1.36)</td> </tr> <tr> <td>3 —</td> <td></td> <td>77</td> </tr> <tr> <td>(2.3)</td> <td></td> <td>(1.36)</td> </tr> </table>	27 —		77	(2.27)		(1.36)	25 —		77	(2.25)		(1.36)	26 —		77	(2.26)		(1.36)	2 —		77	(2.2)		(1.36)	4 —		77	(2.4)		(1.36)	3 —		77	(2.3)		(1.36)	Connector on injector connected. Connector on injector unplugged.		
Cyl.	1	/	12																																																															
Cyl.	2	/	11																																																															
Cyl.	3	/	10																																																															
Cyl.	4	/	9																																																															
Cyl.	5	/	8																																																															
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3 —		77																																																																
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Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
32.0		Injectors (Y63) or (Y64) Control and injection time	N3/2 or N3/3 	Test connection note: For connection information on individual injectors, see ⇒ 31.0. Engine coolant temperature approx. 20 °C at start → Engine coolant temperature approx. 80 °C at idle → accelerate briefly →	Injection time: approx. 8 ms approx. 3 – 5 ms approx. 17 ms (see signals, Figures 18 and 19)	Wiring, ECT sensor (B11/9 or B11/10), IAT sensor (B17/5 or B17/6), O2S 1 (before TWC) (G3/3 or G3/4). LH-SFI control module (N3/2 or N3/3).
33.0	25 ⁴⁾	Right cylinder bank only Upshift delay switchover valve (Y3/3) Current draw	N3/3  64 —┘ (1.23) ┘— 20 (2.20)	Disconnect right LH-SFI control module (N3/3) from contact box (070). Ignition: ON	450 ± 80 mA	Wiring, Y3/3.

³⁾ On vehicles as of 7/91.














⁴⁾ The DTC "25" can be displayed on vehicles up to 7/91 even if no fault exists.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
34.0		Pneumatic upshift delay ³⁾ Vacuum control and sealing	<p>N3/3</p>  64 (1.23) ← → 20 (2.20)	<p>Test connection note: Connect vacuum tester to upshift delay switchover valve (Y3/3) according to Figure 22 and connect bridge to socket box.</p> <p>Engine: at Idle</p>	> 400 mbar	Vacuum lines, Y3/3.
35.0	IS	 DTC readout from base module (N16/1) Automatic transmission kickdown valve (Y3) Voltage supply	<p>N16/1</p>  28 (1.28) ← → 36 (1.36)	<p>Connect socket box to N16/1. Engine: at Idle Engine: OFF</p>	11 – 14 V < 1 V	Wiring, N16/1, ⇒ 35.1
35.1		Automatic transmission kickdown valve (Y3) Current draw	<p>N16/1</p>  36 (1.36) ← → 34 (1.34)	<p>N16/1 disconnected from contact box (070). Ignition: ON Accelerator pedal in wide open throttle position and kickdown switch engaged.</p>	950 ± 80 mA	Wiring, Y3, Kickdown switch (S16/6).



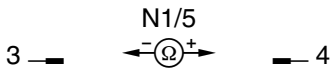
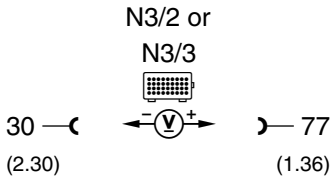
³⁾ On vehicles as of 7/91.

Electrical Test Program – Test

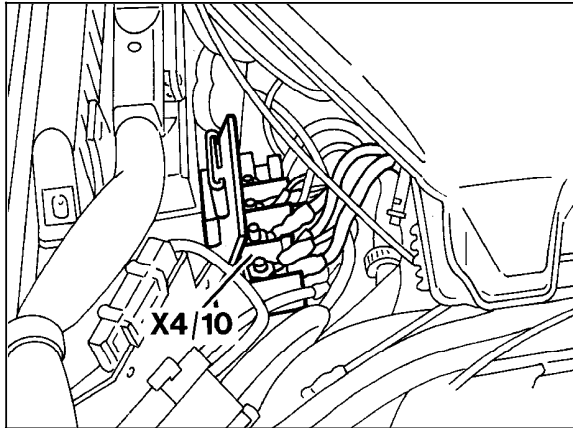
⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
36.0		Diagnostic wire activation	<p>N3/2 or N3/3</p>  <p>76 —  —  — 54</p> <p>(1.35) (1.13)</p>	Engine: ON	11 – 14 V	Wiring, N3/2 or N3/3.
37.0	15	Right cylinder bank only Fuel consumption indicator (A1p10)	<p>N3/3</p>  <p>76 —  —  — 50</p> <p>(1.35) (1.9)</p>	Engine: at Idle and briefly depress accelerator pedal.	> 0.5 V	Wiring, N3/3, A1p10.
38.0		Left cylinder bank only Serial data bus coding	<p>N3/2</p>  <p>43 —  —  — 67</p> <p>(1.2) (1.26)</p>		11 – 14 V	Wiring to electronics ground (W15/1).
39.0	17 18 ⁶⁾ 19	Serial data bus (CAN)	<p>N3/3</p>  <p>L —  —  — H</p>	Ignition: OFF Remove contact module or N3/3 and measure resistance directly at CAN connector for right LH-SFI control module (Figure 23).	55 – 65 Ω	Data line, ⇒ 39.1 ⇒ 39.2

6) The DTC “iB” can be displayed on vehicles up to 7/91 even if no fault exists.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
39.1		CAN element in left DI control module (N1/4)		Disconnect connector (B) on N1/4 and measure directly on control module (Figure 24).	115 – 125 Ω	N1/4.
39.2		CAN element in right DI control module (N1/5)		Disconnect connector (B) on N1/5 and measure directly on control module (Figure 24).	115 – 125 Ω	N1/5.
40.0	28	Coding, LH-SFI control module (N3/2 or N3/3)		Ignition: ON	11 – 14 V	Wiring.
41.0		<i>Non-USA vehicles only.</i> <i>Continue to next test step.</i>				
42.0	15	<i>Non-USA vehicles only.</i> <i>Continue to next test step.</i>				

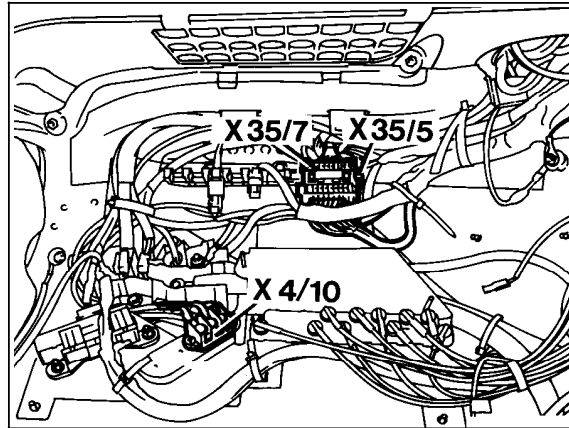
Electrical Test Program – Test



P07-5970-13

Figure 1
Model 129

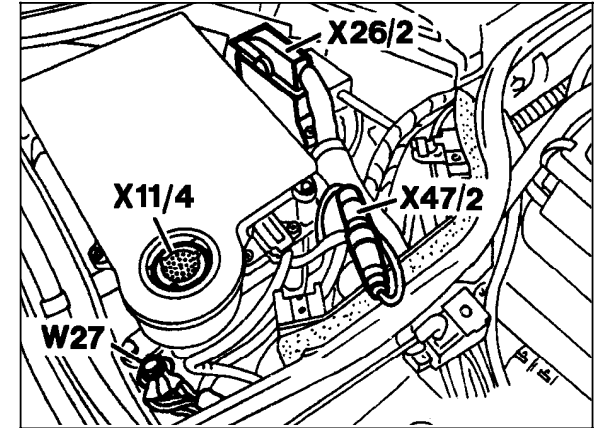
X4/10 Terminal block (circuit 30/30Ü/61e/87L) (6-pole)



P07-2623-13

Figure 2
Model 140

X4/10 Terminal block (circuit 30/circuit 61 battery)
X35/5 Module box/taillamp harness separation point (ASR/ASD) (12-pole)
X35/7 Cockpit/module box separation point (18-pole)

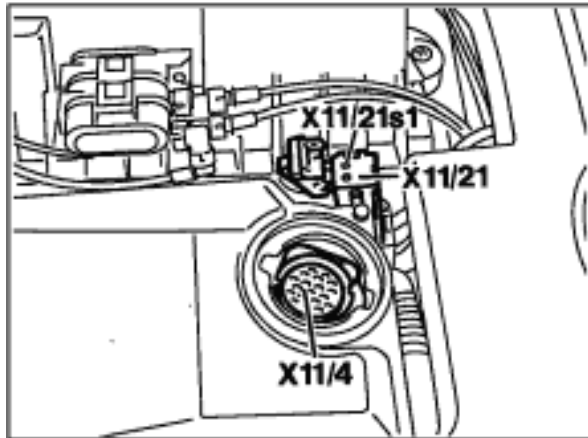


P07-5961-13

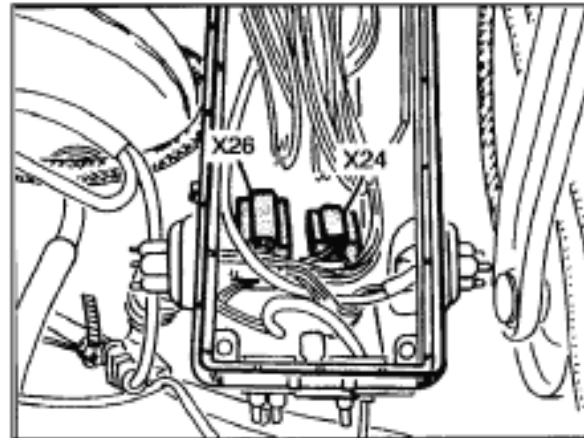
Figure 3
Model 129

W27 Ground (module box bracket)
X11/4 Data link connector (DTC readout)
X26/2 Engine separation point connector
X47/2 CMP sensor intermediate connector

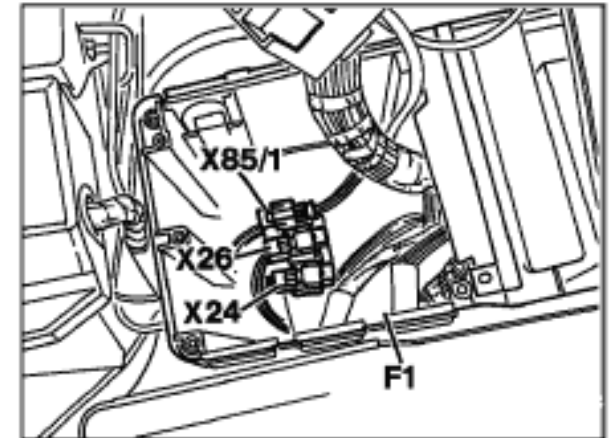
Electrical Test Program – Test



P07-5246-13



0154-34186-1



P54-2864-13

Figure 4
Model 140

- X11/4 Data link connector (DTC readout)
- X11/21 Diagnostic module test connector (3-pole)
(USA) - California
- X11/21s1 Pushbutton (with LED) (USA) - California

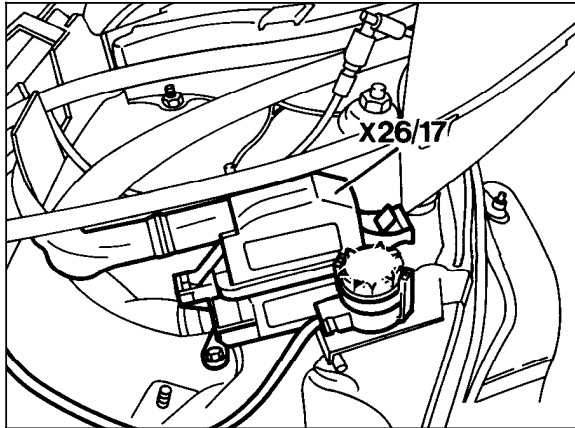
Figure 5
Model 129

- X24 Headlamp harness connector
- X26 Interior/engine connector

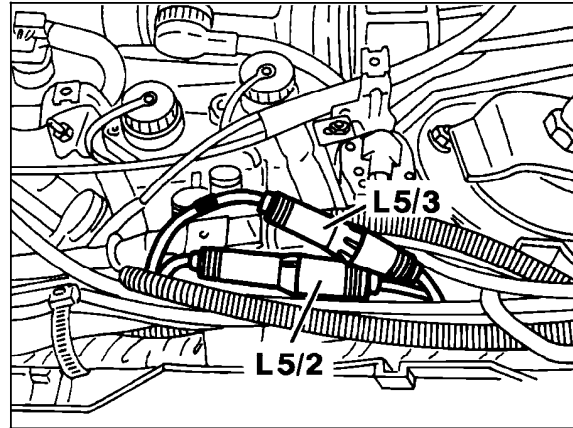
Figure 6
Model 140

- X24 Headlamp harness connector
- X26 Interior/engine connector

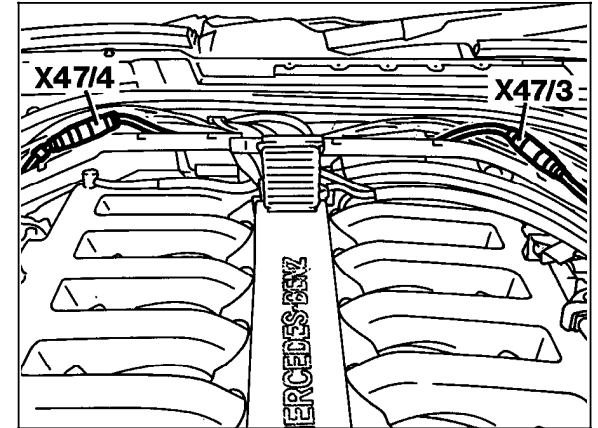
Electrical Test Program – Test



P07-2588-13



P07-5967-13



P07-5219-13

Figure 7
Model 140

X26/17 Engine separation point connector

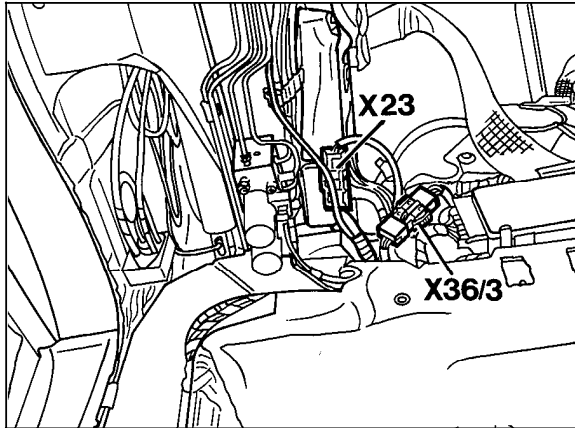
Figure 8
Model 129

X47/3 Left CMP sensor intermediate connector
X47/4 Right CMP sensor intermediate connector

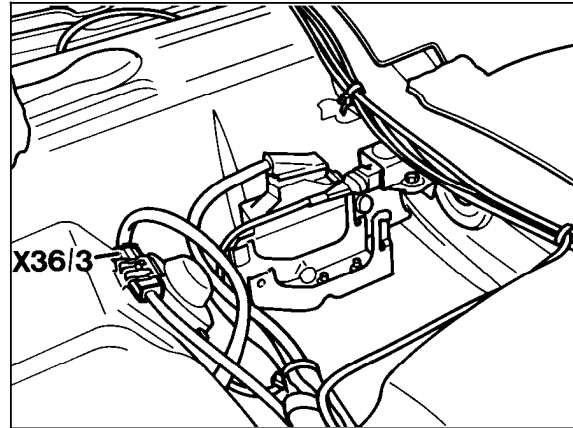
Figure 9
Model 140

X47/3 Left CMP sensor intermediate connector
X47/4 Right CMP sensor intermediate connector

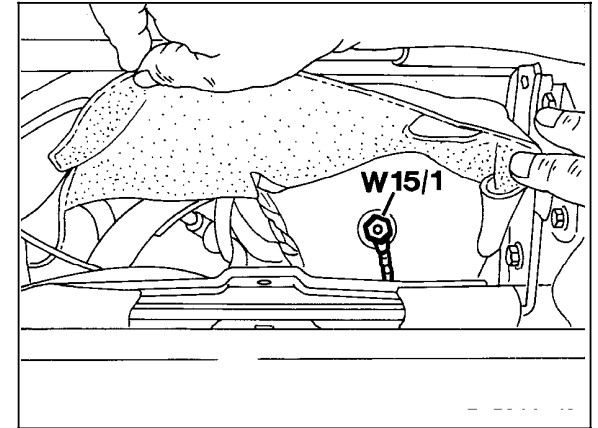
Electrical Test Program – Test



P54-2036-13



P07-2573-13



P07-5963-13

Figure 10
Model 129

X36/3 FP harness connector (2-pole)

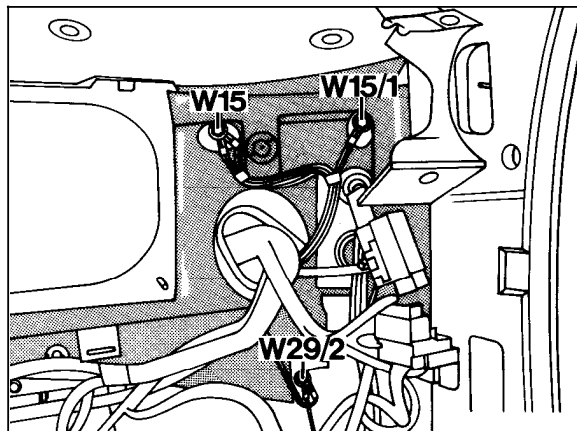
Figure 11
Model 140

X36/3 FP harness connector (2-pole)

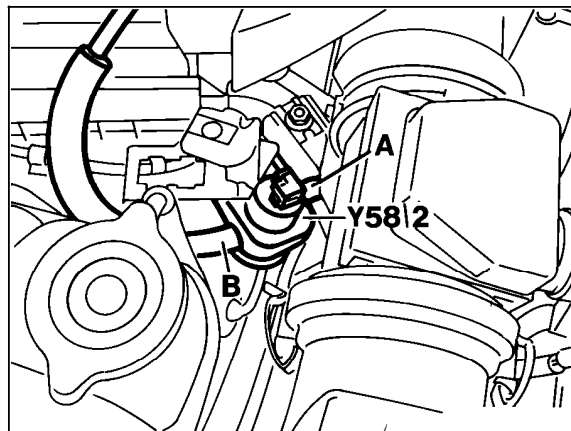
Figure 12
Model 129

W15/1 Ground (electronics - right footwell)

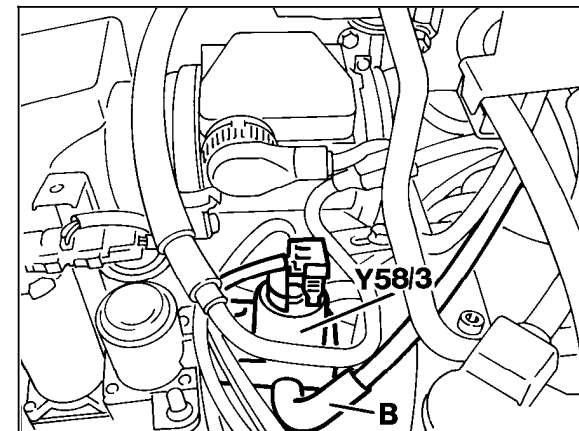
Electrical Test Program – Test



P54-2796-13



P07-5240-13A



P47-5056-13

Figure 13
Model 140

- W15 Ground (electronics output ground - right footwell)
- W15/1 Ground (electronics - right footwell)
- W29/2 Ground (right A-pillar)

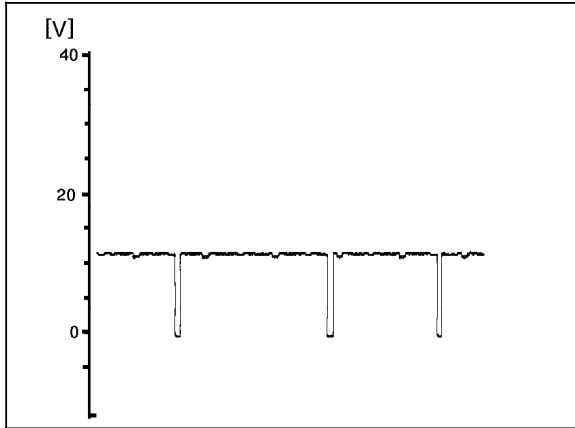
Figure 14

- Y58/2 Left purge control valve
- A Purge line to engine
- B Purge line to charcoal canister

Figure 15

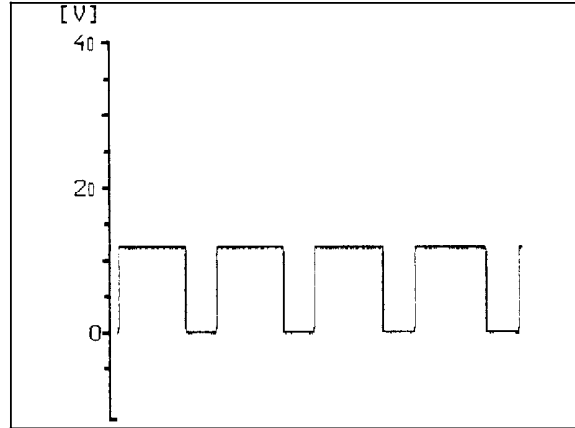
- Y58/3 Right purge control valve
- A Purge line to engine
- B Purge line to charcoal canister

Electrical Test Program – Test



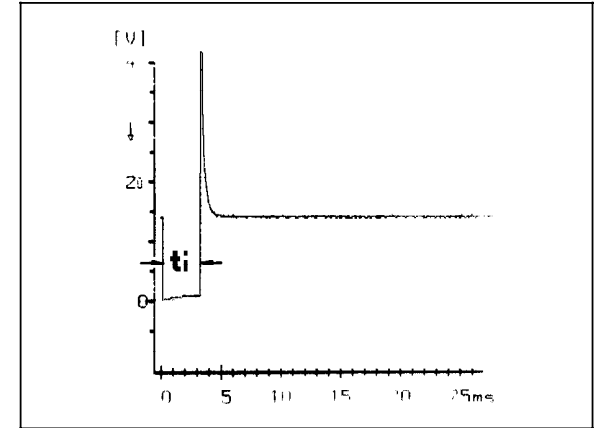
P07-0724-13

Figure 16
Processed CMP sensor signal from DI control module



P15-0370-13

Figure 17
TN-signal



P07-0699-13

Figure 18
Injection time signal "ti" of injectors at closed throttle position
ti = Injection time

Electrical Test Program – Test

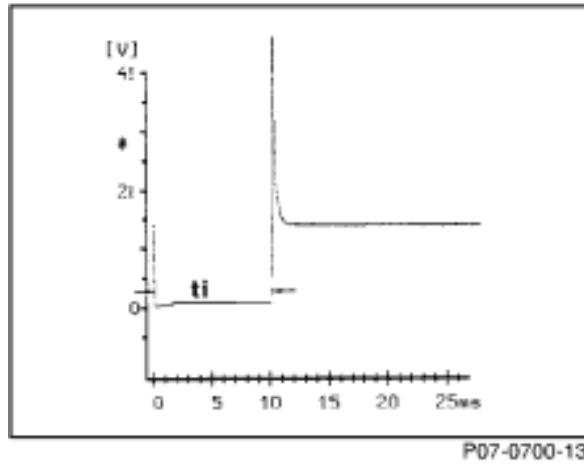


Figure 19
Model

Injection time signal "ti" of injectors when briefly accelerating
ti = Injection time

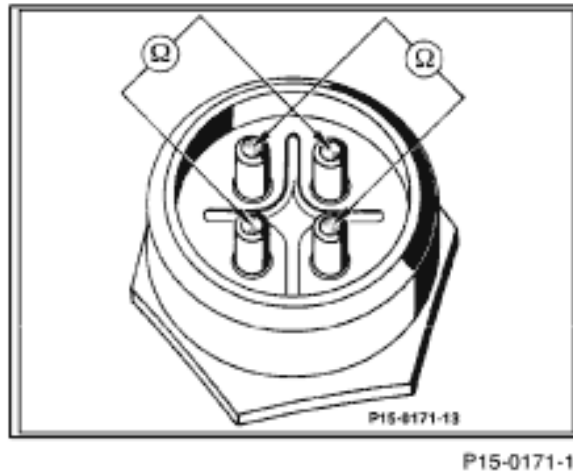


Figure 20
Model

ECT sensor (B11/9 or B11/10)

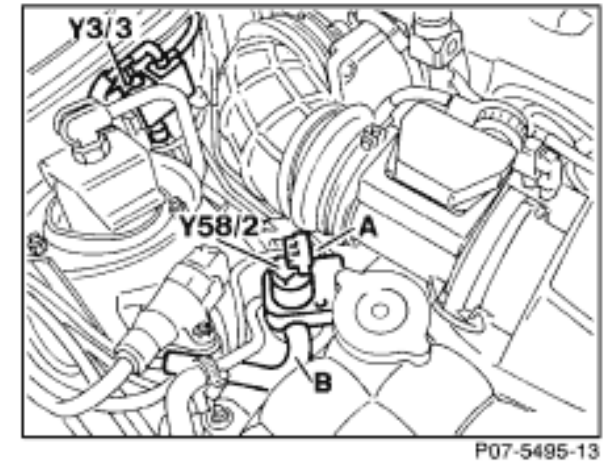
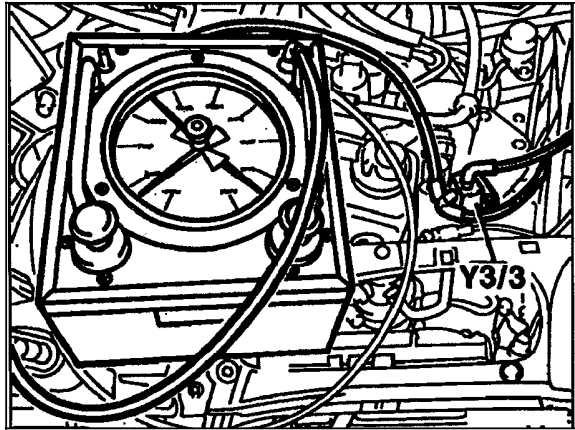


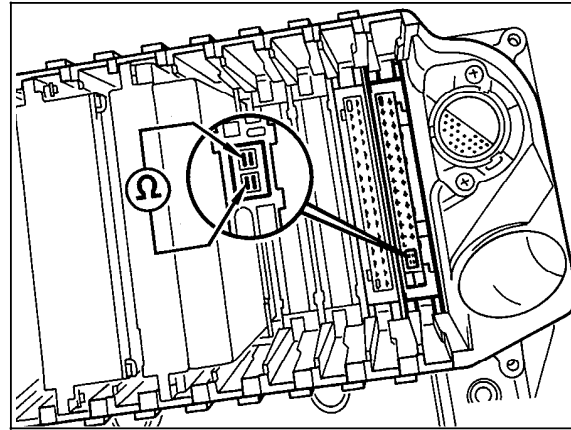
Figure 21
Model 129

Y3/3 Upshift delay switchover valve

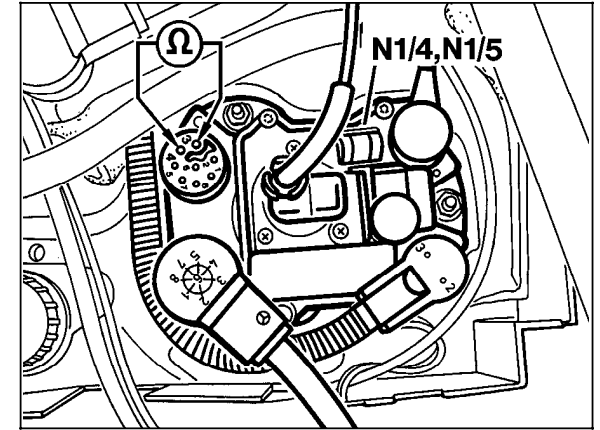
Electrical Test Program – Test



P07-5221-13



P07-5160-13



P15-5058-13

Figure 22
Model 140

Figure 23

Figure 24

Y3/3 Upshift delay switchover valve

Electrical Test Program – Test

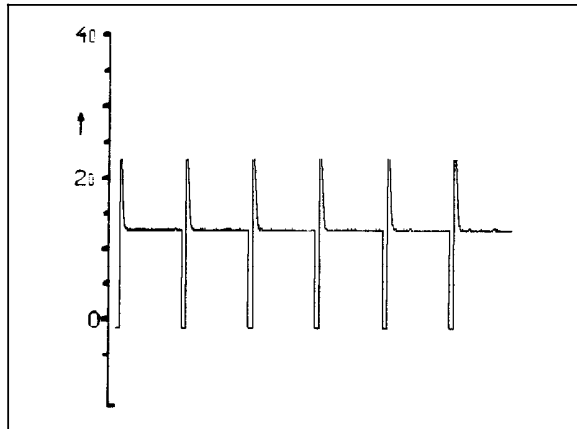


Figure 25
Purge control valve signal