
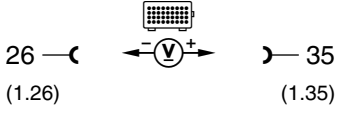
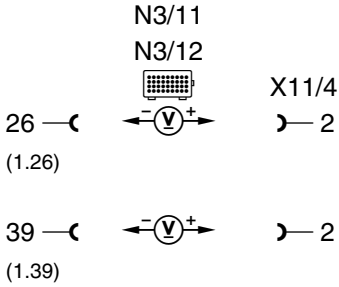
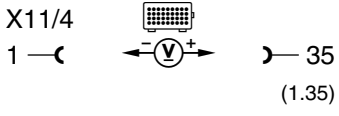







Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	P0 560 P1 587	Engine control module (ME-SFI) (N3/11 or N3/12) Voltage supply Circuit 30	N3/11 N3/12 	Ignition: ON	11 – 14 V	⇒ 1.1
1.1		Ground wire	N3/11 N3/12 	Ignition: ON	11 – 14 V	Wiring, Model 129: Ground (W27), module box bracket. Model 140: Output ground (W15), right footwell. ⇒ 1.2
1.2		Voltage supply Circuit 30	N3/11 N3/12 	Ignition: ON	11 – 14 V	Wiring, Base module (N16/1) or fuse on base module.

Electrical Test Program – Sequential Multiport Fuel Injection System Test





⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.0	PO 560 PI 587	Engine control module (ME-SFI) (N3/11 or N3/12) Voltage supply Circuit 87L	N3/11 N3/12 38 —((1.38) —) 24 (1.24)	Ignition: ON	11 – 14 V	⇒ 2.1
2.1		Electronics ground	N3/11 N3/12 38 —((1.38) —) X11/4 2	Ignition: ON	11 – 14 V	Wiring, Model 129, 140: Electronics ground (W15/1), right footwell. ⇒ 2.2
2.2		Voltage supply Circuit 87L	N3/11 N3/12 X11/4 1 —((1.24) —) 24 (1.24)	Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Wiring, Base module (N16/1) or fuse on base module, Ignition/starter switch (S2/1)
3.0	PO 560 PI 587	Engine control module (ME-SFI) (N3/11 or N3/12) Voltage supply Circuit 87M1e	N3/11 N3/12 39 —((1.39) —) 36 (1.36)	Ignition: ON Ignition: OFF	11 – 14 V < 1 V	Wiring.

Electrical Test Program – Test


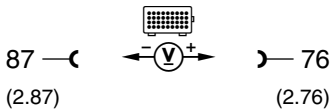
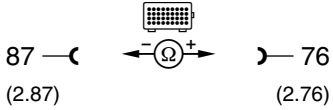

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
4.0	PO 100 PI 146	Left hot film MAF sensor (B2/6) Right hot film MAF sensor (B2/7) Voltage at hot film	N3/11 N3/12 68 — (2.68)  — 67 (2.67)	Ignition: ON Engine: at Idle Engine coolant temperature >70°C	0.6 – 0.9 V ¹⁾	Wiring ⇒ 4.1, Air intake system leak, B2/6 or B2/7
4.1		Ground wire for hot film MAF sensor (B2/6 or B2/7)	N3/11 N3/12 38 — (1.38)  — 67 (2.67)	Ignition: OFF Disconnect MAF sensor (B2/6 or B2/7) connector. Bridge sockets 1 and 4	< 1 Ω	Ground wire.
5.0	PO 105 PI 149	Left pressure sensor (B28/1) Right pressure sensor (B28/2) Sender signal (only )	N3/11 N3/12 87 — (2.87)  — 65 (2.65)	Connect vacuum tester to pressure sensor (B28/1 or B28/2) using Y-fitting (see 21) Ignition: ON Engine: at Idle	> 3.5 V < 2 V and pressure climbs to > 500 mbar.	Vacuum line, Wiring, ⇒ 5.1 B28/1 or B28/2

1) Voltage increases with increasing rpm.


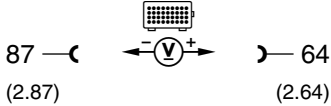
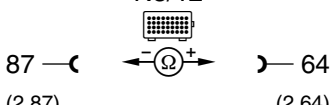
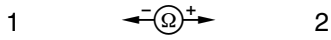
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.1		Pressure sensor (B28/1 or B28/2) Voltage supply	<p style="text-align: center;">N3/11 N3/12</p> 	Ignition: ON	4.7 – 5.3 V	N3/11 or N3/12
6.0		Right engine control module (N3/12) only FP relay module (K27) Activation	<p style="text-align: center;">N3/12</p> 	Ignition: ON Engine: Start	11 – 14 V for approx. 1 sec. 11 – 14 V during cranking and while engine runs.	⇒ 6.1, N3/12
6.1		Current draw (K27)	<p style="text-align: center;">N3/12</p> 	Ignition: ON	0.1 – 0.3 A	Wiring, K27

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy																						
7.0	PO 115 PI 147	Left ECT sensor (B11/9) Right ECT sensor (B11/10) Voltage	<p>N3/11 N3/12</p> 	Ignition: ON	<table border="1"> <tr> <th>°C</th> <th>V</th> </tr> <tr><td>20</td><td>3.5</td></tr> <tr><td>30</td><td>3.1</td></tr> <tr><td>40</td><td>2.7</td></tr> <tr><td>50</td><td>2.3</td></tr> <tr><td>60</td><td>1.9</td></tr> <tr><td>70</td><td>1.5</td></tr> <tr><td>80</td><td>1.2</td></tr> <tr><td>90</td><td>1.0</td></tr> <tr><td>100</td><td>0.8</td></tr> <tr><td colspan="2">±5 %</td></tr> </table>	°C	V	20	3.5	30	3.1	40	2.7	50	2.3	60	1.9	70	1.5	80	1.2	90	1.0	100	0.8	±5 %		⇒ 7.1, N3/11 or N3/12
°C	V																											
20	3.5																											
30	3.1																											
40	2.7																											
50	2.3																											
60	1.9																											
70	1.5																											
80	1.2																											
90	1.0																											
100	0.8																											
±5 %																												
7.1		Resistance	<p>N3/11 N3/12</p> 	Ignition: OFF Disconnect connector 2 on engine control module (N3/11 or N3/12).	<table border="1"> <tr> <th>°C</th> <th>Ω</th> </tr> <tr><td>20</td><td>2500</td></tr> <tr><td>30</td><td>1700</td></tr> <tr><td>40</td><td>1170</td></tr> <tr><td>50</td><td>830</td></tr> <tr><td>60</td><td>600</td></tr> <tr><td>70</td><td>435</td></tr> <tr><td>80</td><td>325</td></tr> <tr><td>90</td><td>245</td></tr> <tr><td>100</td><td>185</td></tr> <tr><td colspan="2">±5 %</td></tr> </table>	°C	Ω	20	2500	30	1700	40	1170	50	830	60	600	70	435	80	325	90	245	100	185	±5 %		Wiring, ⇒ 7.2
°C	Ω																											
20	2500																											
30	1700																											
40	1170																											
50	830																											
60	600																											
70	435																											
80	325																											
90	245																											
100	185																											
±5 %																												
7.2		ECT sensor (B11/9 or B11/10) Resistance	<p>B11/9 B11/10</p> 	Disconnect connector on ECT sensor (B11/9 or B11/10).	Nominal value, see ⇒ 7.1	B11/9 or B11/10																						


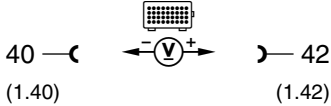
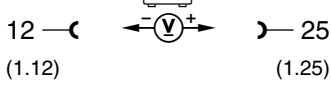
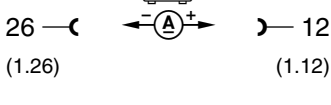
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy																		
8.0	PO 110 PI 148	Left IAT sensor (B17/5) Right IAT sensor (B17/6) Voltage	N3/11 N3/12 	Ignition: ON	<table border="1"> <tr> <th>°C</th> <th>V</th> </tr> <tr> <td>10</td> <td>3.2</td> </tr> <tr> <td>20</td> <td>2.6</td> </tr> <tr> <td>30</td> <td>2.1</td> </tr> <tr> <td>40</td> <td>1.6</td> </tr> <tr> <td>50</td> <td>1.2</td> </tr> <tr> <td>60</td> <td>0.9</td> </tr> <tr> <td>70</td> <td>0.7</td> </tr> <tr> <td colspan="2" style="text-align: center;">±5 %</td> </tr> </table>	°C	V	10	3.2	20	2.6	30	2.1	40	1.6	50	1.2	60	0.9	70	0.7	±5 %		⇒ 8.1, N3/11 or N3/12
°C	V																							
10	3.2																							
20	2.6																							
30	2.1																							
40	1.6																							
50	1.2																							
60	0.9																							
70	0.7																							
±5 %																								
8.1		Resistance (B17/5 or B17/6)	N3/11 N3/12 	Ignition: OFF Disconnect connector 2 on engine control module (N3/11 or N3/12).	<table border="1"> <tr> <th>°C</th> <th>Ω</th> </tr> <tr> <td>10</td> <td>9670</td> </tr> <tr> <td>20</td> <td>6060</td> </tr> <tr> <td>30</td> <td>3900</td> </tr> <tr> <td>40</td> <td>2600</td> </tr> <tr> <td>50</td> <td>1760</td> </tr> <tr> <td>60</td> <td>1220</td> </tr> <tr> <td>70</td> <td>860</td> </tr> <tr> <td colspan="2" style="text-align: center;">±5 %</td> </tr> </table>	°C	Ω	10	9670	20	6060	30	3900	40	2600	50	1760	60	1220	70	860	±5 %		Wiring, ⇒ 8.2
°C	Ω																							
10	9670																							
20	6060																							
30	3900																							
40	2600																							
50	1760																							
60	1220																							
70	860																							
±5 %																								
8.2		IAT sensor (B17/5 or B17/6) Resistance	B17/5 B17/6 	Disconnect connector from IAT sensor (B17/5 or B17/6).	Nominal value, see ⇒ 8.1	B17/5 or B17/6																		


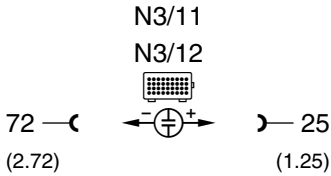
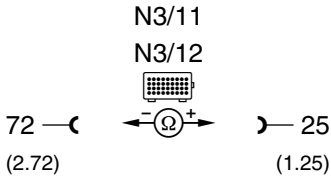
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
9.0		Right engine control module (N3/12) only TN-signal output	<p>N3/12</p> <p>38 —((1.38) —) 56 (1.56)</p> <p>N3/12</p> <p>38 —((1.38) —) 56 (1.56)</p>	<p>Test with Oscilloscope: Engine: Start or Engine: at Idle</p> <p>Test with multimeter: (only if oscilloscope not available)</p>	<p>Signal: see Figure 2.</p> <p>5 – 7.5 V</p>	Wiring, N3/12
10.0	<p>PO 130</p> <p>PO 133</p> <p>PO 140</p> <p>PO 150</p> <p>PO 153</p> <p>PO 160</p>	<p>Left O2S 1 (before TWC) (G3/3)</p> <p>Right O2S 1 (before TWC) (G3/4)</p> <p>O2S signal</p>	<p>N3/11</p> <p>N3/12</p> <p>40 —((1.40) —) 41 (1.41)</p>	ECT > 80 ° C, run engine at idle for at least two minutes.	fluctuates from – 0.2 V to + 1.0 V, by more than 0.3 V	Wiring, G3/3 or G3/4, ⇒ 11.0
11.0	<p>PO 135</p> <p>PO 155</p>	<p>Left O2S 1 (before TWC) (G3/3)</p> <p>Right O2S 1 (before TWC) (G3/4)</p> <p>O2S heater activation</p>	<p>N3/11</p> <p>N3/12</p> <p>13 —((1.13) —) 25 (1.25)</p>	ECT > 80 ° C, run engine at idle for at least two minutes.	11 – 14 V	⇒ 11.1, N3/11 or N3/12
11.1		O2S 1 (G3/3 or G3/4) Current draw	<p>N3/11</p> <p>N3/12</p> <p>26 —((1.26) —) 13 (1.13)</p>	Ignition: ON	0.6 – 3.4 A	Wiring, G3/3 or G3/4




Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
12.0	PQ 136 PQ 156	Left O2S 2 (afterTWC) (G3/5) Right O2S 2 (afterTWC) (G3/6) O2S signal (only USA)	N3/11 N3/12 	ECT > 80° C, Engine: Start Raise and hold engine speed at 2000 – 3000 rpm for approx. two minutes until O2S 2 heater turns on (see HHT).	The range of 450mV to 550mV, must be attained or not attained within 1 minute.	Wiring, ⇒ 13.0
13.0	PQ 141 PQ 161	Left O2S 2 (after TWC) (G3/5) Right O2S 2 (after TWC) (G3/6) O2S heater activation (only USA)	N3/11 N3/12 	Engine: at Idle ECT > 80° C, run engine at idle for at least two minutes.	11 – 14 V	⇒ 13.1, N3/11 or N3/12
13.1		O2S 2 (G3/5 or G3/6) Current draw	N3/11 N3/12 	Ignition: ON	0.6 – 3.4 A	Wiring, G3/5 or G3/6




Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
14.0	P0 201 P0 207	Injector (Y64y1, Y63y7) Activation and injection time		ECT approx. 20° C at start: ECT approx. 80° C at idle: accelerate briefly:	Injection time: approx. 8 ms approx. 3 – 5 ms approx. 14 ms (signals see Figures 2 and 3)	⇒ 14.1, N3/11 or N3/12, Further possibilities: ECT sensor (B11/9 or B11/10), IAT sensor (B17/5 or B17/6), O2S 1 (G3/3 or G3/4).
14.1		Resistance		Ignition: OFF	14 – 17 Ω	Wiring, Y64y1, Y63y7


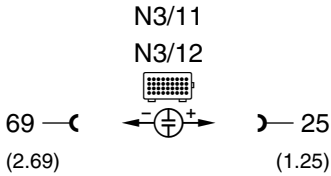
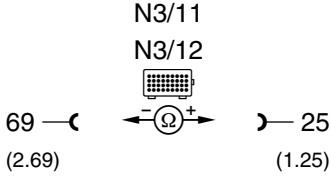
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
15.0	PQ 202 PQ 208	Injector (Y64y2, Y63y8) Activation and injection time	N3/11 N3/12 	ECT approx. 20° C at start: ECT approx. 80° C at idle: accelerate briefly:	Injection time: approx. 8 ms approx. 3 – 5 ms approx. 14 ms (signals see Figures 2 and 3)	⇒ 15.1, N3/11 or N3/12, Further possibilities: ECT sensor (B11/9 or B11/10), IAT sensor (B17/5 or B17/6), O2S 1 (G3/3 or G3/4).
15.1		Resistance	N3/11 N3/12 	Ignition: OFF	14 – 17 Ω	Wiring, Y64y2, Y63y8


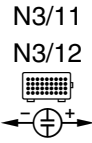

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
16.0	PQ 203 PQ 209	Injector (Y64y3, Y63y9) Activation and injection time	N3/11 N3/12 	ECT approx. 20° C at start: ECT approx. 80° C at idle: accelerate briefly:	Injection time: approx. 8 ms approx. 3 – 5 ms approx. 14 ms (signals see Figures 2 and 3)	⇒ 16.1, N3/11 or N3/12, Further possibilities: ECT sensor (B11/9 or B11/10), IAT sensor (B17/5 or B17/6), O2S 1 (G3/3 or G3/4).
16.1		Resistance	N3/11 N3/12 	Ignition: OFF	14 – 17 Ω	Wiring, Y64y3, Y63y9


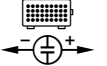
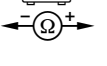
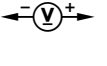
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
17.0	P0 204 P0 210	Injector (Y64y4, Y63y10) Activation and injection time		ECT approx. 20° C at start: ECT approx. 80° C at idle: accelerate briefly:	Injection time: approx. 8 ms approx. 3 – 5 ms approx. 14 ms (signals: see Figures 2 and 3).	⇒ 17.1, N3/11 or N3/12 Further possibilities: ECT sensor (B11/9 or B11/10), IAT sensor (B17/5 or B17/6), O2S 1 (G3/3 or G3/4).
17.1		Resistance (Y64y4 or Y63y10)		Ignition: OFF	14 – 17 Ω	Wiring, Y64y4 or Y63y10


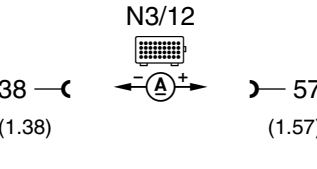
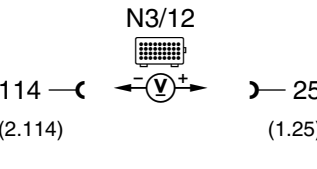
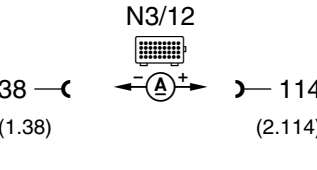
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
18.0	PQ 205 PQ 211	Injector (Y64y5, Y63y11) Activation and injection time		ECT approx. 20° C at start: ECT approx. 80° C at idle: accelerate briefly:	Injection time: approx. 8 ms approx. 3 – 5 ms approx. 14 ms (signals: see Figures 2 and 3).	⇒ 18.1, N3/11 or N3/12 Further possibilities: ECT sensor (B11/9 or B11/10), IAT sensor (B17/5 or B17/6), O2S 1 (G3/3 or G3/4).
18.1		Resistance (Y64y5 or Y63y11)		Ignition: OFF	14 – 17 Ω	Wiring, Y64y5, Y63y11


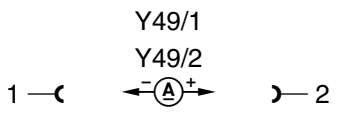
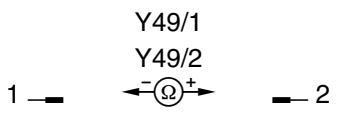
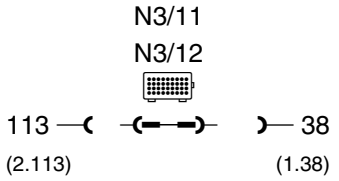

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
19.0	PO 206 PO 212	Injector (Y64y6, Y63y12) Activation and injection time	<p>N3/11 N3/12</p>  <p>82 —((2.82) —) 25 (1.25)</p>	<p>ECT approx. 20° C at start:</p> <p>ECT approx. 80° C at idle: accelerate briefly:</p>	<p>Injection time: approx. 8 ms</p> <p>approx. 3 – 5 ms approx. 14 ms</p> <p>(see Figures 2 and 3)</p>	<p>⇒ 19.1, N3/11 or N3/12,</p> <p>Further possibilities: ECT sensor (B11/9 or B11/10), IAT sensor (B17/5 or B17/6), O2S 2 (G3/3 or G3/4).</p>
19.1		Resistance (Y64y6 or Y63y12)	<p>N3/11 N3/12</p>  <p>82 —((2.82) —) 25 (1.25)</p>	Ignition: OFF	14 – 17 Ω	Wiring, Y64y6, Y63y12
20.0	PO 410 PI 453 PI 463	Right engine control module (N3/12) AIR relay module (K17) Activation	<p>N3/12</p>  <p>57 —((1.57) —) 25 (1.25)</p>	<p>Disconnect right ECT sensor (B11/10) connector. Simulate 2.5 kΩ resistance at sockets 1 and 4 with resistance substitution unit.</p> <p>Engine: at Idle</p>	11 – 14 V for approx. two minutes and AIR pump runs.	⇒ 20.1, N3/12


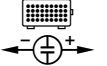
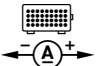
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
20.1		Current draw (K17)	<p style="text-align: center;">N3/12</p> 	Ignition: ON	0.1 – 0.3 A	Wiring, K17
21.0	P0 410 P1 420 P1 463	Right engine control module (N3/12) AIR pump switchover valve (Y32) Activation	<p style="text-align: center;">N3/12</p> 	Disconnect right ECT sensor (B11/10) connector. Simulate 2.5 kΩ resistance at sockets 1 and 4 with resistance substitution unit. Engine: at Idle	11 – 14 V for approx. two minutes and AIR pump runs.	⇒ 21.1, N3/12
21.1		Current draw (Y32)	<p style="text-align: center;">N3/12</p> 	Ignition: ON	0.3 – 0.5 A	Wiring, Y32




Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
22.0	P1 519 P1 522 P1 525 P1 533	Left adjustable camshaft timing solenoid (Y49/1) Right adjustable camshaft timing solenoid (Y49/2) Current draw		Connect test cable (102 589 04 63 00) to solenoid. Engine: Start and increase engine speed to 3000 rpm.	approx. 1.0 A	⇒ 22.1, ⇒ 23.0, N3/11 or N3/12.
22.1		Resistance Y49/1 or Y49/2		Ignition: OFF Unplug connector on left or right camshaft timing solenoid (Y49/1 or Y49/2).	7 – 12 Ω	Y49/1 or Y49/2
23.0	P1 519 P1 522 P1 525 P1 533	Left adjustable camshaft timing solenoid (Y49/1) Right adjustable camshaft timing solenoid (Y49/2) Mechanical function		Engine: at Idle  Bridge sockets on socket box for a maximum of 10 seconds only.	Engine runs rough after approx. 5 seconds.	Check function of camshaft adjuster (see SMS, Engine 120, Job No. 05-2160).







Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
24.0	P0 440 P0 441 P0 446 P0 443 P1 443 P1 490	Left purge control valve (Y58/2) Right purge control valve (Y58/3) Activation	N3/11 N3/12 	Engine: at Idle and at operating temperature.	After approx. 1 minute, purge control valve (Y58/2 or Y58/3) must noticeably cycle Signal (see Figure 4).	⇒ 24.1, ⇒ 25.0, N3/11 or N3/12
24.1		Current draw (y58/2 or Y58/3)	N3/11 N3/12 	Ignition: ON	0.1 – 0.3 A	Wiring, Y58/2 or Y58/3
25.0	P0 440 P0 441 P1 443	Purge control valve (Y58/2 or Y58/3) Vacuum control		Connect vacuum tester to purge control valve (Y58/2 or Y58/3) connector (A) (see 21). Engine at operating temperature and at idle, increase engine speed to maximum 3000 rpm	After approx. 1 minute, > 50 mbar and needle oscillates.	Vacuum line, Y58/2 or Y58/3



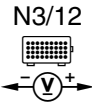
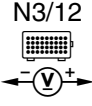
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
26.0	P0 440 P0 442 P0 445 P0 446	<p>Only (USA), Model 140 and 129 as of 09/97 Right engine control module (N3/12)</p> <p>Purge system Leaks</p> <p>Activated charcoal canister shut-off valve (Y58/4) activated</p>	<p>N3/12 </p> <p>26 —((1.26) ←(→))— 34 (1.34)</p>	<p>Disconnect purge line (A) to charcoal canister on right purge control valve (Y58/3, left side of engine compartment). Connect vacuum tester to purge line (see 21). Ignition: ON</p> <p>Apply approx. 25 mbar of vacuum.</p>	<p>After approx. 1 minute, < 5 mbar vacuum loss.</p>	<p>Fuel tank cap, Purge line to charcoal canister, Purge line from charcoal canister to Y58/4, Activated charcoal canister, Y58/4, Fuel tank pressure sensor (B4/3)</p>
27.0	P0 446	<p>Only (USA), Model 140 and 129 as of 09/97 Right engine control module (N3/12)</p> <p>Activated charcoal canister shut-off valve (Y58/4) Current draw</p>	<p>N3/12 </p> <p>38 —((1.38) ←(A)→)— 34 (1.34)</p>	<p>Ignition: ON</p>	<p>0.5 – 0.9 A</p>	<p>Fuses, Wiring, Y58/4</p>


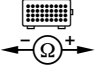
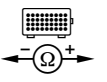
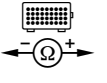
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
28.0	P0 446 P0 450 P0 455	Only  , Model 140 and 129 as of 09/97 Right engine control module (N3/12) Fuel tank pressure sensor (B4/3) Sender signal Activated charcoal canister shut-off valve (Y58/4) activated	N3/12  53 —((1.53) ←(V)→)— 51 (1.51) N3/12  26 (1.26) ←(—)→ 34 (1.34)	Disconnect purge line (A) to charcoal canister on right purge control valve (Y58/3, left side of engine compartment). Connect vacuum tester to purge line (see 21). Ignition: ON Apply approx. 25 mbar of vacuum.	> 3 V < 2.5 V	⇒ 28.1, Wiring, Vacuum line, Activated charcoal canister plugged, B4/3
28.1		Only  Fuel tank pressure sensor (B4/3) Voltage supply	N3/12  53 —((1.53) ←(V)→)— 44 (1.44)	Ignition: ON	4.7 – 5.3 V	N3/12


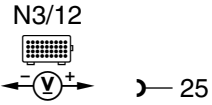
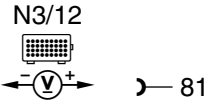
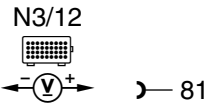
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
29.0	P0 450	<p>Only , Model 129 up to 09/97</p> <p>Right engine control module (N3/12)</p> <p>Purge monitoring pressure sensor (B4/4)</p> <p>Sender signal</p>	<p>N3/12</p> 	<p>Disconnect purge line (A) to charcoal canister on purge monitoring pressure sensor (B4/4). Connect vacuum tester to purge monitoring pressure sensor (see 21).</p> <p>Ignition: ON</p> <p>Apply approx. 300 mbar of vacuum.</p>	<p>> 3.5 V</p> <p>< 3 V</p>	<p>Wiring, ⇒ 29.1, B4/4</p>
29.1		<p>Purge monitoring pressure sensor (B4/4)</p> <p>Voltage supply</p>	<p>N3/12</p> 	<p>Ignition: ON</p>	<p>4.7 – 5.3 V</p>	<p>N3/12</p>




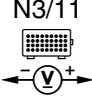
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
30.0	PO 600 PI 570 PI 588 PI 641 PI 747	CAN data bus	N3/11 N3/12 	Ignition: OFF Disconnect connector 1 from test cable and measure resistance directly at connector 1 (interior) using an ohmmeter. Wire connections: see 22.	75 – 85 Ω	⇒ 30.1, ⇒ 30.2, Data line.
30.1		CAN element in RCL control module (N54) Resistance	N54 N54/1 	Ignition: OFF Disconnect control module (N54 or N54/1) and test directly at pins (Figure 5).	115 – 125 Ω	N54 or N54/1
30.2		CAN element in engine control module (N3/11 or N3/12) Resistance	N3/11 N3/12 	Ignition: OFF Disconnect connector 1 (interior) from engine control module (N3/11 or N3/12) and test directly at pins.	235 – 245 Ω	N3/11 or N3/12


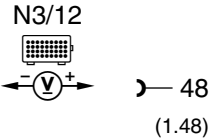
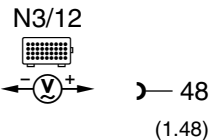

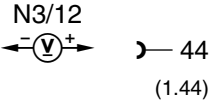
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy																				
31.0	P1 163	Right engine control module (N3/12) Oil level switch (S43)	<p>N3/12</p> 	Ignition: ON Oil level okay. Oil level low.	11 – 14 V < 1 V	Wiring, S43																				
32.0	P1 177	Oil temperature sensor (B1) to ME control module (N3/12) Voltage	<p>N3/12</p> 	Ignition: ON	<table border="1"> <thead> <tr> <th>°C</th> <th>V</th> </tr> </thead> <tbody> <tr><td>10</td><td>3.9</td></tr> <tr><td>20</td><td>3.5</td></tr> <tr><td>30</td><td>3.1</td></tr> <tr><td>40</td><td>2.7</td></tr> <tr><td>50</td><td>2.3</td></tr> <tr><td>60</td><td>1.9</td></tr> <tr><td>70</td><td>1.5</td></tr> <tr><td>80</td><td>1.2</td></tr> <tr><td colspan="2">±5 %</td></tr> </tbody> </table>	°C	V	10	3.9	20	3.5	30	3.1	40	2.7	50	2.3	60	1.9	70	1.5	80	1.2	±5 %		⇒ 32.1 N3/12
°C	V																									
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32.1		Oil temperature sensor (B1) Resistance	<p>N3/12</p> 	Ignition: ON	<table border="1"> <thead> <tr> <th>°C</th> <th>Ω</th> </tr> </thead> <tbody> <tr><td>10</td><td>3807</td></tr> <tr><td>20</td><td>2510</td></tr> <tr><td>30</td><td>1722</td></tr> <tr><td>40</td><td>1195</td></tr> <tr><td>50</td><td>854</td></tr> <tr><td>60</td><td>614</td></tr> <tr><td>70</td><td>450</td></tr> <tr><td>80</td><td>335</td></tr> <tr><td colspan="2">±5 %</td></tr> </tbody> </table>	°C	Ω	10	3807	20	2510	30	1722	40	1195	50	854	60	614	70	450	80	335	±5 %		Wiring, B1
°C	Ω																									
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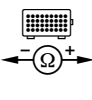
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
33.0		Fuel consumption signal up to 05/96	<p style="text-align: center;">N3/12</p> 	Engine: idle , then briefly apply throttle.	>0.5 V	Wiring, N3/12
34.0		Diagnosis line Activation	<p style="text-align: center;">N3/11 N3/12</p> 	Ignition: ON	11 – 14 V	Wiring, N3/11 or N3/12
35.0		Only on left engine control module (N3/11) Coding	<p style="text-align: center;">N3/11</p> 	Ignition: ON	11 – 14 V	Wiring.


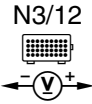
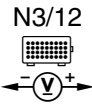
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
36.0	P1 605	<p>Only on right engine control module (N3/12) until 05/96 (eliminated as of 06/96)</p> <p>Body acceleration sensor (B24/7)</p> <p>Sensor signal in static state</p>	<p>N3/12</p> 	Ignition: ON	2.35 – 2.65 V	Wiring, ⇒ 36.1, B24/7
		<p>Sensor signal in dynamic state</p>	<p>N3/12</p> 	Vigorously move left front corner of vehicle by hand.	<p>> 5 mV</p>  <p>Value changes with movement of vehicle.</p>	
36.1		Voltage supply (B24/7)	<p>N3/12</p> 	Ignition: ON	4.7 – 5.3 V	N3/12
37.0	P1 437 P1 444	<i>Not applicable to U.S.A. version vehicles</i>				
37.1		<i>Not applicable to U.S.A. version vehicles</i>				

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
38.0		<p>Only model 140 on right engine control module (N3/12) until 05/96 (as of 06/96 via CAN) (only USA) Fuel tank cap open signal</p>	<p>N3/12  23 ← (1.23) → 25 (1.25)</p>	<p>Engine: at Idle Tank cap open Tank cap closed after approx. 18 minutes</p>	<p>11 – 14 V < 1 V</p>	<p>Leak in purge system, ⇒ 26.0</p>
39.0		<p>Only on right engine control module (N3/12) until 05/96 (as of 06/96 via CAN) (only USA) “CHECK ENGINE” MIL (A1e26)</p>	<p>N3/12  11 ← (1.11) → 25 (1.25)</p>	<p>Ignition: ON</p>	<p>11 – 14 V</p>	<p>N3/12</p>
40.0		<p>Engine control module (ME-SFI) coding Bridge</p>	<p>N3/11 N3/12  73 ← (2.73) → 96 (2.96)</p>	<p>Ignition: OFF</p>	<p>< 1 Ω</p>	<p>Wiring.</p>

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
41.0		<p>Only model 129 on right engine control module (N3/12) (as of 06/98)</p> <p>Starter relay module (K38/1)</p> <p>Activation</p>	<p style="text-align: center;">N3/12</p> 	<p>Starter switch in position 3 (start position):</p> <p>Crank briefly:</p>	<p>11 – 14 V or if engine does not start for approx. 5 seconds.</p>	<p>⇒ 41.1, N3/12</p>
41.1		<p>Starter signal, circuit 50</p>	<p style="text-align: center;">N3/12</p> 	<p>Ignition: Start engine</p>	<p>11 – 14 V during the start sequence.</p>	<p>Wiring, Ignition/starter switch</p>

Electrical Test Program – Sequential Multiport Fuel Injection System Test

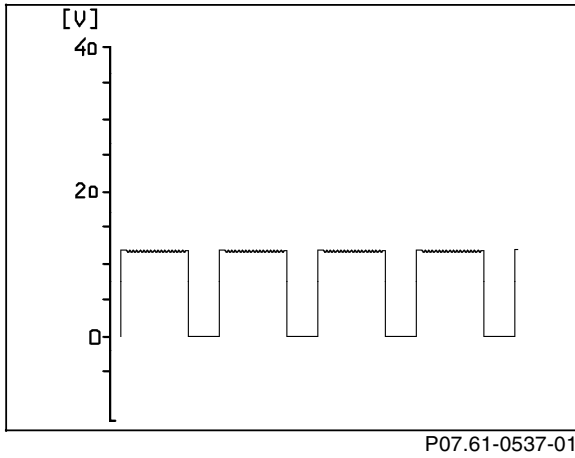


Figure 1
TN signal

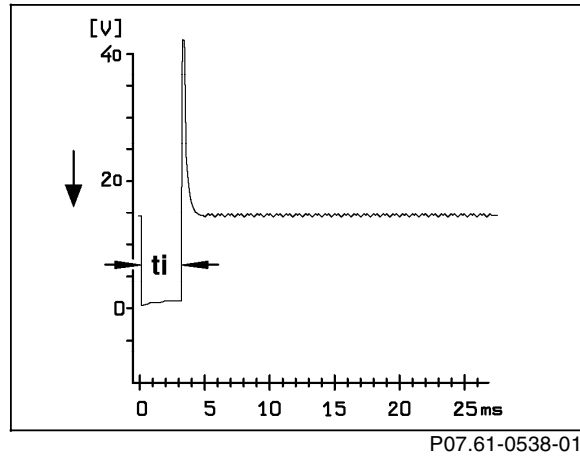


Figure 2
Injection duration "ti" at CTP

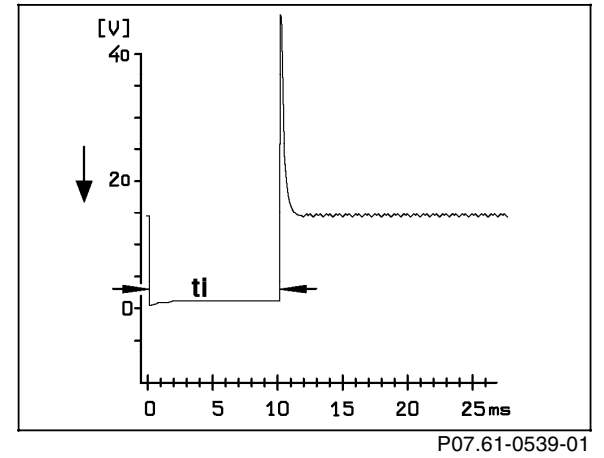
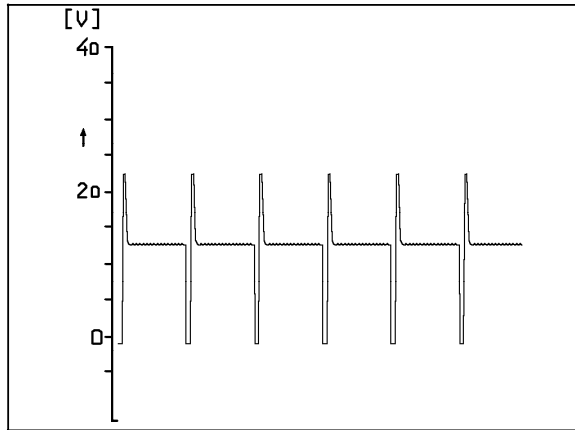
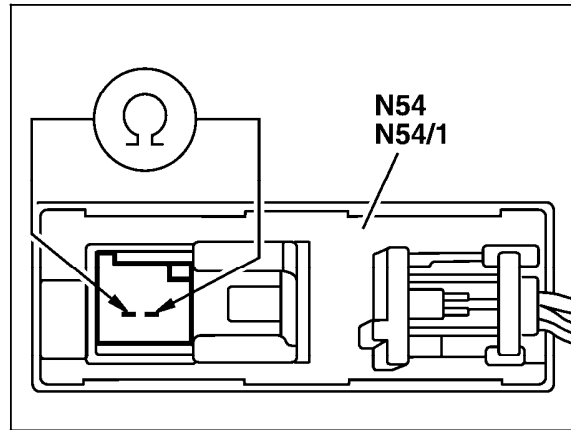


Figure 3
Injection duration "ti" at WOT

Electrical Test Program – Sequential Multiport Fuel Injection System Test



P07.61-0540-01



P07.51-0426-13

Figure 4
Purge control valve signal

Figure 5
N54 RCL control module
N54/1 DAS control module