
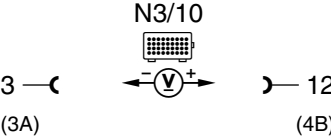
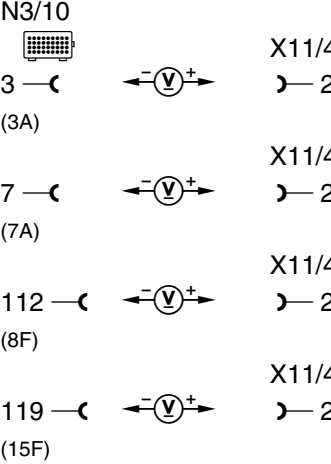



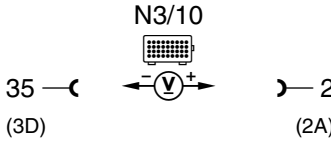
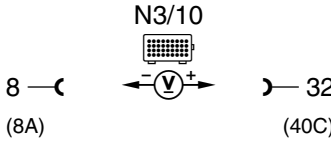
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
1.0	P0 560	Engine control module (ME-SFI) (N3/10) Voltage supply Circuit 30 U		Ignition: ON	11 – 14 V	⇒ 1.1 ⇒ 1.2
1.1		Ground wire, Output ground		Ignition: ON	11 – 14 V	Wiring, Models 202, 208, 210: Output ground (W16/6), right component compartment. Model 163: Ground (W16), component compartment. ⇒ 1.2


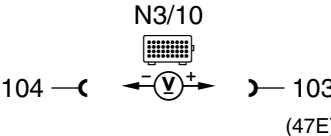
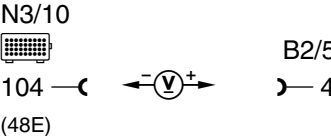
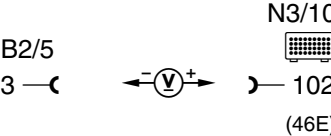
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
1.2		Voltage supply Circuit 30	X11/4 1 ← → 12 (4B)	Ignition: ON	11 – 14 V	Wiring, Passenger-side fuse and relay module (K40/4). or Fuse and relay box (F1).
2.0	PO 560	Engine control module (ME-SFI) (N3/10) Voltage supply Circuit 87 U	N3/10 8 ← (8A) → 2 (2A)	Ignition: ON	11 – 14 V	⇒ 2.1 – 2.2
2.1		Electronics ground	N3/10 8 ← (8A) → 2 X11/4	Ignition: ON	11 – 14 V	Wiring, Models 202, 208, 210 Output ground (W16/6), right component compartment. Model 163: Ground (W16), component compartment.
2.2		Voltage supply Circuit 87	X11/4 1 ← → 12 (2A)	Ignition: ON Model 163: Connect socket 4 to 16- pole test connector Ignition: OFF	11 – 14 V < 1 V	Wiring, Passenger-side fuse and relay module (K40/4). or Fuse and relay box (F1).


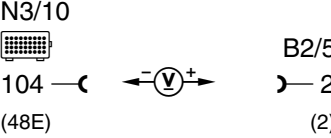


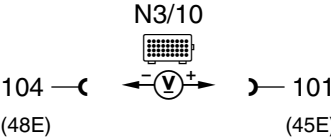
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
3.0		<p>Starter relay Models 202, 208, 210: (K40/4k2) in passenger-side fuse and relay module box (K40/4) Model 163: (F1k8) in fuse and relay box Activation</p>		<p>ECT temperature > 20 ° C Vehicle with AT Ignition/starter switch (S2/1): position 3 (start position): crank engine briefly</p>	<p>11 – 14 V or if engine does not start in approx. 5 seconds.</p>	<p>⇒ 3.1, Engine control module (N3/10)</p>
3.1		<p>Starter signal circuit 50</p>		<p>Engine: Start</p>	<p>11 – 14 V while starting.</p>	<p>Wiring, Ignition/starter switch (S2/1)</p>


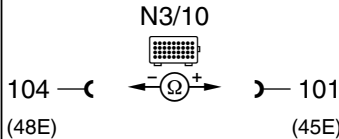

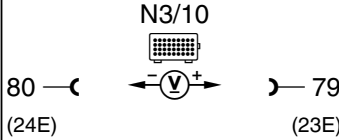
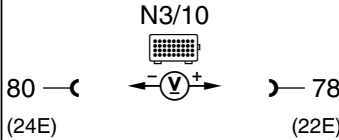
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
4.0	PO 100	Hot film MAF sensor (B2/5) Hot film signal		Ignition: ON Engine: at Idle Engine coolant temperature >70°C	0.9 – 1.1 V 1.3 – 1.7 V Increasing rpm, increasing voltage.	⇒ 4.1 – 4.3, Wiring, Air intake system leak, B2/5
4.1		Hot film MAF sensor (B2/5) Voltage supply 5 V		Disconnect MAF sensor (B2/5) connector and measure directly on socket 4 (brown/yellow). Ignition: ON	4.7 – 5.2 V	Wiring, N3/10
4.2		Ground wire for hot film MAF sensor (B2/5)		Disconnect MAF sensor (B2/5) connector and measure directly on socket 3 (brown). Ignition: ON	4.7 – 5.2 V	Wiring.


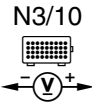
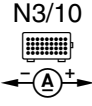
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy																
4.3		Hot film MAF sensor (B2/5) Voltage supply 12 V		Disconnect MAF sensor (B2/5) connector and connect plus of voltmeter to socket 2 (red/blue). Ignition: ON	11 – 14 V	Wiring, Passenger-side fuse and relay module (K40/4). or Fuse and relay box (F1f11).																
5.0	 	IAT sensor in hot film MAF sensor (B2/5) Voltage		Ignition: ON	<table border="0"> <tr> <td>°C</td> <td>V</td> </tr> <tr> <td>10</td> <td>3.1</td> </tr> <tr> <td>20</td> <td>2.7</td> </tr> <tr> <td>30</td> <td>2.2</td> </tr> <tr> <td>40</td> <td>1.8</td> </tr> <tr> <td>50</td> <td>1.4</td> </tr> <tr> <td>60</td> <td>1.1</td> </tr> <tr> <td></td> <td>± 5%</td> </tr> </table>	°C	V	10	3.1	20	2.7	30	2.2	40	1.8	50	1.4	60	1.1		± 5%	⇒ 5.1 N3/10
°C	V																					
10	3.1																					
20	2.7																					
30	2.2																					
40	1.8																					
50	1.4																					
60	1.1																					
	± 5%																					


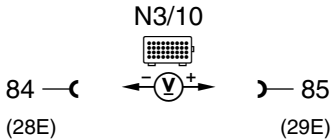
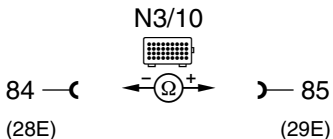
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy																
5.1		IAT sensor Resistance		Ignition: OFF Disconnect connector E on engine control module (N3/10).	<table border="0"> <tr> <td>oC</td> <td>Ω</td> </tr> <tr> <td>10</td> <td>3600</td> </tr> <tr> <td>20</td> <td>2420</td> </tr> <tr> <td>30</td> <td>1660</td> </tr> <tr> <td>40</td> <td>1170</td> </tr> <tr> <td>50</td> <td>850</td> </tr> <tr> <td>60</td> <td>600</td> </tr> <tr> <td></td> <td>± 5%</td> </tr> </table>	oC	Ω	10	3600	20	2420	30	1660	40	1170	50	850	60	600		± 5%	Wiring, B2/5
oC	Ω																					
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20	2420																					
30	1660																					
40	1170																					
50	850																					
60	600																					
	± 5%																					
6.0	PO 105	Only  Pressure sensor (B28) Sensor signal Pressure sensor (B28) Voltage supply	 	Connect vacuum tester to pressure sensor (B28) using Y-fitting (see Figure 1). Ignition: ON Engine: at Idle Ignition: ON	 > 3.5 V < 2 V and vacuum climbs to > 500 mbar. 4.7 – 5.3 V	Vacuum line, Wiring, B28, N3/10																



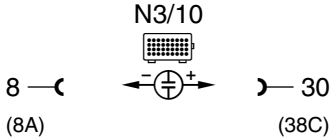
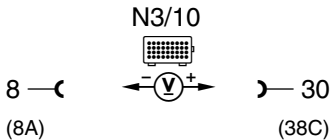
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
7.0		<p>FP relay module Models 202/208/210: (K27) Model 163: (F1k3) in fuse and relay box Activation</p>	<p>N3/10 </p>	<p>Ignition: ON The activation of the FP occurs only once after ignition "ON". For the next activation, the engine must have run briefly.</p> <p>Engine: Start</p>	<p>11 – 14 V for approx. 1 sec.</p>	<p>Fuses, Wiring, K27 or F1k3, N3/10</p>
		<p>Current draw (K27) or (F1k3)</p>	<p>N3/10 </p>	<p>Ignition: ON</p>	<p>11 – 14 V during cranking and while engine runs.</p> <p>0.1 – 0.3 A</p>	


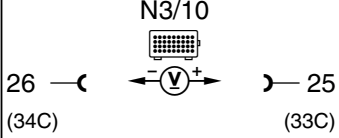
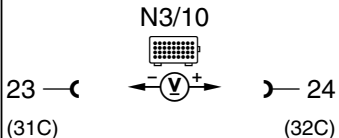
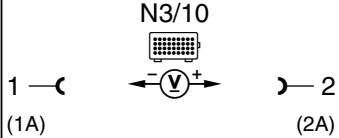
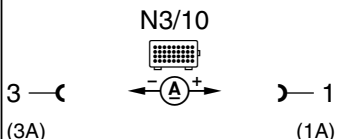
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy																						
8.0	P0115	ECT sensor (B11/4) Voltage		Ignition: ON	<table border="1"> <thead> <tr> <th>°C</th> <th>V</th> </tr> </thead> <tbody> <tr><td>20</td><td>3.4</td></tr> <tr><td>30</td><td>2.9</td></tr> <tr><td>40</td><td>2.4</td></tr> <tr><td>50</td><td>1.9</td></tr> <tr><td>60</td><td>1.5</td></tr> <tr><td>70</td><td>1.2</td></tr> <tr><td>80</td><td>0.9</td></tr> <tr><td>90</td><td>0.7</td></tr> <tr><td>100</td><td>0.5</td></tr> <tr><td></td><td>±5 %</td></tr> </tbody> </table>	°C	V	20	3.4	30	2.9	40	2.4	50	1.9	60	1.5	70	1.2	80	0.9	90	0.7	100	0.5		±5 %	⇒ 8.1, N3/10
°C	V																											
20	3.4																											
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100	0.5																											
	±5 %																											
8.1		Resistance (B11/4)		Ignition: OFF Disconnect connector E on engine control module (N3/10).	<table border="1"> <thead> <tr> <th>°C</th> <th>Ω</th> </tr> </thead> <tbody> <tr><td>20</td><td>3090</td></tr> <tr><td>30</td><td>2000</td></tr> <tr><td>40</td><td>1330</td></tr> <tr><td>50</td><td>900</td></tr> <tr><td>60</td><td>630</td></tr> <tr><td>70</td><td>440</td></tr> <tr><td>80</td><td>320</td></tr> <tr><td>90</td><td>230</td></tr> <tr><td>100</td><td>170</td></tr> <tr><td></td><td>±5 %</td></tr> </tbody> </table>	°C	Ω	20	3090	30	2000	40	1330	50	900	60	630	70	440	80	320	90	230	100	170		±5 %	Wiring, ⇒ 8.2
°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																						
8.2		ECT sensor (B11/4) Resistance	1  2	Disconnect connector on ECT sensor (B11/4).	<table border="0"> <tr> <td>°C</td> <td>Ω</td> </tr> <tr> <td>20</td> <td>3090</td> </tr> <tr> <td>30</td> <td>2000</td> </tr> <tr> <td>40</td> <td>1330</td> </tr> <tr> <td>50</td> <td>900</td> </tr> <tr> <td>60</td> <td>630</td> </tr> <tr> <td>70</td> <td>440</td> </tr> <tr> <td>80</td> <td>320</td> </tr> <tr> <td>90</td> <td>230</td> </tr> <tr> <td>100</td> <td>170</td> </tr> <tr> <td></td> <td>±5 %</td> </tr> </table>	°C	Ω	20	3090	30	2000	40	1330	50	900	60	630	70	440	80	320	90	230	100	170		±5 %	B11/4
°C	Ω																											
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100	170																											
	±5 %																											
9.0		Engine control module (N3/10) TN-signal output	 	Test with oscilloscope. Engine: Start or Engine: at Idle Test with multimeter only if oscilloscope is not available.	Signal: see Figure 2. 7.5 – 9.0 V	Wiring, N3/10																						


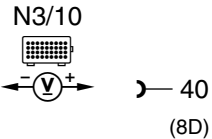
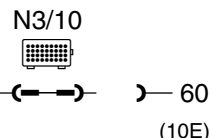
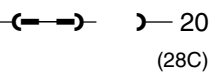
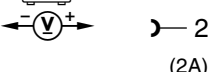
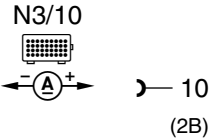
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
10.0	P0 150 P0 153 P0 160	Left O2S 1 (before TWC) (G3/3) O2S signal	N3/10 	If 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	⇒ 12.0, Wiring, G3/3
11.0	P0 130 P0 133 P0 140	Right O2S 1 (before TWC) (G3/4) O2S signal	N3/10 	If 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	⇒ 13.0, Wiring, G3/4
12.0	P0 155	Left O2S 1 (before TWC) (G3/3) O2S heater Activation O2S 1 (G3/3) Current draw	N3/10  N3/10 	If ECT > 80° C, run engine at idle for at least 2 minutes. Disconnect connector A on engine control module N3/10 Ignition: ON	11 – 14 V 1.0 – 4.5 A	Fuses, Wiring, G3/3, N3/10



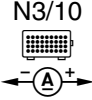
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
13.0	PO 135	Right O2S 1 (after TWC) (G3/4) O2S heater Activation O2S 2 (G3/4) Current draw	<p>N3/10</p> <p>N3/10</p>	If ECT > 80° C, run engine at idle for at least 2 minutes. Disconnect connector A on engine control module N3/10 Ignition: ON	11 – 14 V 1.0 – 4.5 A	Fuses, Wiring, G3/4, N3/10
14.0	PO 156 PO 160	Only (USA) Left O2S 2 (after TWC) (G3/5) O2S signal	<p>N3/10</p> <p>N3/10</p> <p>N3/10</p>	If ECT > 80° C, run engine at 2000-3000 rpm for approx. 2 minutes. Engine: at Idle Bridge sockets on socket box.	The mV range of 450 - 500 mV must be exceeded or not attained within 1 minute. Air pump runs. Voltage changes within 60 seconds to < 40 mV	⇒ 16.0, Wiring, G3/5, N3/10


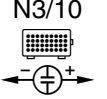
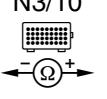
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
15.0	PO 136	<p>Only (USA) Right O2S 2 (after TWC) (G3/6) O2S signal</p>	<p>N3/10 </p> <p>N3/10 </p> <p>N3/10 </p>	<p>If ECT > 80° C, run engine at 2000-3000 rpm for approx. 2 minutes.</p> <p>Engine: at Idle</p> <p>Bridge sockets on socket box.</p>	<p>The mV range of 450 - 500 mV must be exceeded or not attained within 1 minute.</p> <p>Air pump runs. Voltage changes within 60 seconds to < 40 mV</p>	<p>⇒ 17.0, Wiring, G3/6, N3/10</p>
16.0	PO 161	<p>Only (USA) Left O2S 2 (after TWC) (G3/5) O2S heater Activation</p> <p>O2S 2 (G3/5) Current draw</p>	<p>N3/10 </p> <p>N3/10 </p>	<p>Engine: at Idle</p> <p>If ECT > 80° C, run engine at idle for at least 2 minutes.</p> <p>Disconnect connector B on engine control module N3/10</p> <p>Ignition: ON</p>	<p>11 – 14 V or voltage fluctuates between 11 – 14 V.</p> <p>1.0 – 4.5 A</p>	<p>Fuses, Wiring, G3/5, N3/10</p>


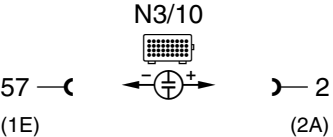
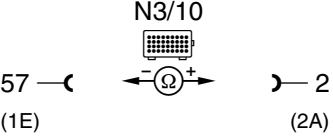
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
17.0	P0141	<p>Only (USA) Right O2S 2 (after TWC) (G3/6) O2S heater Activation</p> <p>O2S 2 (G3/6) Current draw</p>	<p>N3/10 </p> <p>N3/10 </p>	<p>Engine: at Idle If ECT > 80° C, run engine at idle for at least 2 minutes.</p> <p>Disconnect connector B on engine control module</p> <p>Ignition: ON</p>	<p>11 – 14 V or voltage fluctuates between 11 – 14 V.</p> <p>1.0 – 4.5 A</p>	<p>Fuses, Wiring, G3/6, N3/10</p>


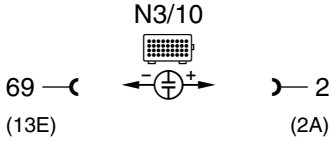
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
18.0	PQ 201	<p>Injector (Y62y1) Activation and injection time</p> <p>Resistance (Y62y1)</p>	<p>N3/10</p>  <p>81 — (25E) 2 — (2A)</p> <p>N3/10</p>  <p>81 — (25E) 2 — (2A)</p>	<p>ECT approx. 20° C at start:</p> <p>ECT approx. 80° C at idle: accelerate briefly:</p> <p>Ignition: OFF</p>	<p>Injection time: approx. 8 ms</p> <p>approx. 3 – 5 ms approx. 14 ms</p> <p>(signal: see Figures 3 and 4)</p> <p>14 – 18 Ω</p>	<p>Fuses, Wiring, Y62y1, N3/10,</p> <p>Further possibilities: ECT sensor (B11/4), IAT sensor in hot film MAF sensor (B2/5), O2S 1 (G3/3 or G3/4).</p>




Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
19.0	PQ 202	Injector (Y62y2) Activation and injection time Resistance (Y62y2)	 	ECT approx. 20° C at start: ECT approx. 80° C at idle: accelerate briefly: Ignition: OFF	Injection time: approx. 8 ms approx. 3 – 5 ms approx. 14 ms (signal: see Figures 3 and 4) 14 – 18 Ω	Fuses, Wiring, Y62y2, N3/10, Further possibilities: ECT sensor (B11/4), IAT sensor in hot film MAF sensor (B2/5), O2S 1 (G3/3 or G3/4).


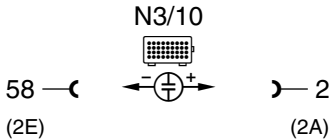
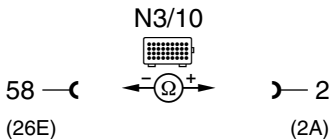
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
20.0	P0 203	Injector (Y62y3) Activation and injection time Resistance (Y62y3)		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 (signal: see Figures 3 and 4) Ignition: OFF 14 – 18 Ω	Fuses, Wiring, Y62y3, N3/10 Further possibilities: ECT sensor (B11/4), IAT sensor in hot film MAF sensor (B2/5), O2S 1 (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
21.0	P0 204	<p>Injector (Y62y4) Activation and injection time</p> <p>Resistance (Y62y4)</p>	<p>N3/10 </p> <p>82 — (26E) ← ⊕ → — 2 (2A)</p> <p>N3/10 </p> <p>82 — (26E) ← Ω → — 2 (2A)</p>	<p>ECT approx. 20° C at start:</p> <p>ECT approx. 80° C at idle: accelerate briefly:</p> <p>Ignition: OFF</p>	<p>Injection time: approx. 8 ms</p> <p>approx. 3 – 5 ms approx. 14 ms (signal: see Figures 3 and 4)</p> <p>14 – 18 Ω</p>	<p>Fuses, Wiring, Y62y4, N3/10</p> <p>Further possibilities: ECT sensor (B11/4), IAT sensor in hot film MAF sensor (B2/5), O2S 1 (G3/3 or G3/4).</p>


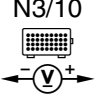
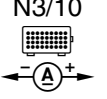
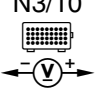
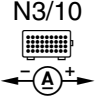
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
22.0	PO 205	Injector (Y62y5) Activation and injection time		ECT approx. 20° C at start:	Injection time: approx. 8 ms	Fuses, Wiring, Y62y5, N3/10 Further possibilities: ECT sensor (B11/4), IAT sensor in hot film MAF sensor (B2/5), O2S 1 (G3/3 or G3/4).
		Resistance (Y62y5)		ECT approx. 80° C at idle: accelerate briefly:	approx. 3 – 5 ms approx. 14 ms (signal see Figures 3 and 4)	
				Ignition: OFF	14 – 18 Ω	


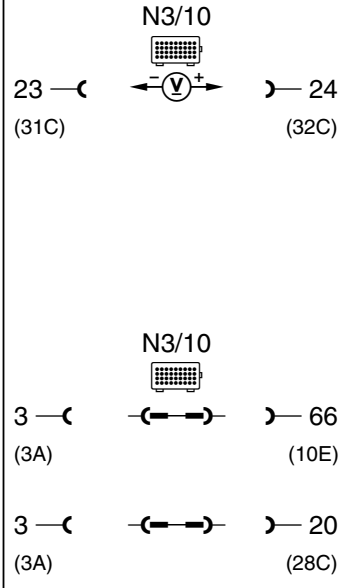
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
23.0	PO 206	Injector (Y62y6) Activation and injection time Resistance (Y62y6)	<div style="text-align: center;"> <p>N3/10</p> <p>70 — (14E) ← ⊕ → — 2 (2A)</p> </div> <div style="text-align: center;"> <p>N3/10</p> <p>70 — (14E) ← Ω → — 2 (2A)</p> </div>	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 (signal: see Figures 3 and 4) Ignition: OFF 14 – 18 Ω	Fuses, Wiring, Y62y6, N3/10 Further possibilities: ECT sensor (B11/4), IAT sensor in hot film MAF sensor (B2/5), O2S 1 (G3/3 or G3/4).


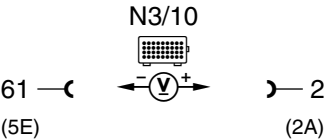
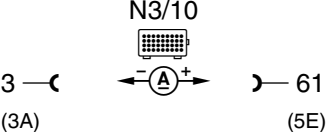
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
24.0	PI 453	<p>Only (USA) AIR relay module Models 202/208/210: (K17), in Passenger-side fuse and relay module box (K40/4) Model 163: in fuse and relay box (F1k28) Activation</p> <p>Current draw (K40/4) or (F1k28)</p>	<p>N3/10 </p> <p>N3/10 </p>	<p>Disconnect ECT sensor (B11/4) connector. Simulate 2.5 kΩ resistance at sockets 1 and 2 with resistance substitution unit. Engine: at Idle</p> <p>Ignition: ON</p>	<p>11 – 14 V for approx. two minutes and AIR pump runs.</p> <p>0.1 – 0.3 A</p>	<p>Fuses, Wiring, K40/4 or F1k28, N3/10</p>
25.0	PI 420	<p>Only (USA) AIR pump switchover valve (Y32) Activation</p> <p>Current draw (Y32)</p>	<p>N3/10 </p> <p>N3/10 </p>	<p>Disconnect ECT sensor (B11/4) connector. Simulate 2.5 kΩ resistance at sockets 1 and 2 with resistance substitution unit. Engine: at Idle</p> <p>Ignition: ON</p>	<p>11 – 14 V for approx. two minutes and AIR pump runs.</p> <p>0.3 – 0.5 A</p>	<p>Fuses, Wiring, Y32, N3/10</p>

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
26.0	P0 410	Only (USA) AIR system (logic chain)		Note: The O2S 1 signal before TWC is measured. If ETC > 80°C run engine at idle for at least 2 minutes. Bridge sockets on socket box	The O2S voltage oscillates in the area of -0.2 V and +1.0 V AIR pump runs. Voltage changes to < 100 mV within 20 seconds	Y32, AIR combi valve, AIR pump no output.


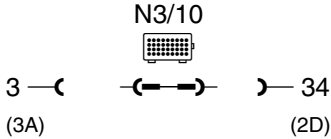
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
27.0	PO 400 PI 400	EGR valve vacuum transducer (Y31/1) Activation and vacuum control		Note regarding test: This test is not possible on Models 163 and 210 4MATIC Note to test connection: Connect vacuum tester to EGR valve vacuum transducer, after removing the MAF sensor with air box. Engine: at idle ETC > 60°C Vehicle at approx. 3000/rpm while on dynamometer	 < 1 V and < 10 mbar vacuum. 1 – 7 V and 80 – 220 mbar vacuum. 0.3 – 0.5 A	Fuses, Wiring, N3/10, Y31/1
		Current draw (Y31/1)		Ignition: ON		


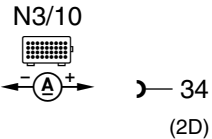
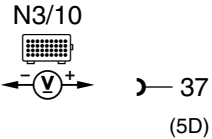
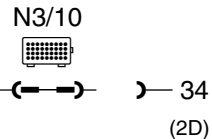
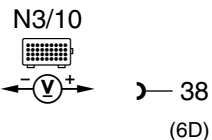
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
28.0	PO 802 PI 225	Resonance intake manifold switchover valve (Y22/6) Activation Current draw (Y22/6)	<p>N3/10</p> <p>68 —()— (12E) —()— 2 (2A)</p> <p>N3/10</p> <p>3 —()— (3A) —()— 68 (12E)</p>	<p>Engine: Start Engine: at idle</p> <p>Engine: accelerate briefly to > approx. 3900 rpm</p> <p>Ignition: ON</p>	<p>< 1 V</p> <p>9 – 14 V and vacuum applied to valve.</p> <p>0.3 – 0.5 A</p>	Fuses, Wiring, Y22/6, N3/10
29.0	PO 441 PO 443	Purge control valve (Y58/1) Activation Current draw (Y58/1)	<p>N3/10</p> <p>13 —()— (21C) —()— 2 (2A)</p> <p>N3/10</p> <p>3 —()— (3A) —()— 13 (21C)</p>	<p>Engine: at Idle and at operating temperature.</p> <p>Ignition: ON</p>	<p>After approx. 2 minutes, purge control valve (Y58/1) must noticeably cycle, Signal: see Figure 5.</p> <p>0.3 – 0.5 A</p>	⇒ 30.0, Fuses, Wiring, Y58/1, N3/10


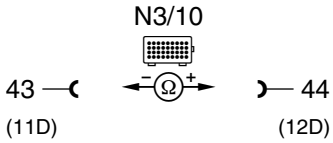
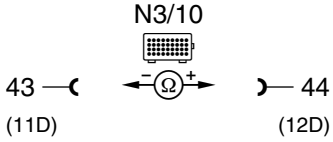
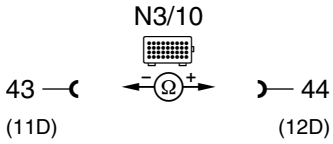
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
30.0	PD 440 PD 441 PD 446	Purge control valve (Y58/1) Vacuum control		Connect vacuum tester to purge control valve (Y58/1) between purge line to charcoal canister. Engine at operating temperature and at idle.	After approx. 2 minute, > 50 mbar and needle oscillates, Y58/1 must cycle.	Vacuum lines, Y58/1
31.0	PD 440 PD 442 PD 446 PD 455	Only (USA) Purge system Leaks Activated charcoal canister shut-off valve (Y58/4) Activated		Disconnect purge line (A) to charcoal canister on purge control valve (Y58/1). Connect vacuum tester to purge line. Ignition: ON Apply approx. 25 mbar of vacuum.	After approx. 1 minute, < 5 mbar vacuum loss.	Fuel tank cap, Purge line to charcoal canister, Purge line from charcoal canister to Y58/4, Charcoal canister, Y58/1, Y58/4, B4/3


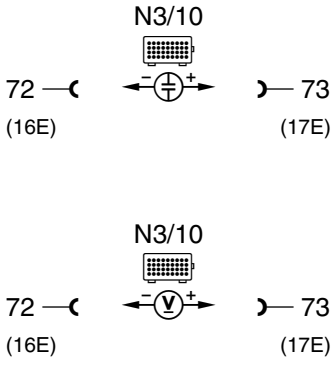
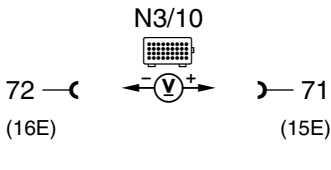
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
32.0	PO 446	<p>Only (USA) Activated charcoal canister shut-off valve (Y58/4) Current draw</p>	<p>N3/10 </p>	Ignition: ON	0.5 – 0.9 A	Fuses, Wiring, Y58/4
33.0	PO 446 PO 450 PO 455	<p>Only (USA) Fuel tank pressure sensor (B4/3) Sender signal</p> <p>Activated charcoal canister shut-off valve (Y58/4) is activated</p>	<p>N3/10 </p> <p>N3/10 </p>	<p>Disconnect purge line (A) to charcoal canister on purge control valve (Y58/1). Connect vacuum tester to purge line.</p> <p>Ignition: ON</p> <p>Apply approx. 25 mbar of vacuum.</p>	<p>> 2.9 V</p> <p>< 2.3 V</p>	⇒ 33.1, Wiring, Vacuum line, Charcoal canister clogged, B4/3
33.1		<p>Only (USA) Fuel tank pressure sensor (B4/3) Voltage supply</p>	<p>N3/10 </p>	Ignition: ON	4.7 – 5.3 V	N3/10


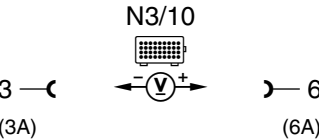
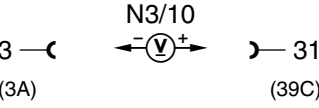
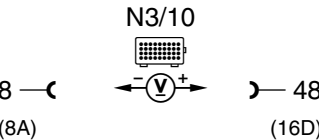
Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
34.0	PD 600 PD 811 PI 570 PI 603 PI 747	CAN data bus		Ignition: OFF	55 – 65 Ω	⇒ 34.1 – 34.2 Data line.
34.1		CAN element in electronic ignition lock control module (N73) or DAS radio frequency/infrared control module (N54/1) or Instrument cluster (A1) Resistance		Ignition: OFF Disconnect connector D from engine control module N3/10.	115 – 125 Ω	Wiring, Model 202, 208, 210: N73, Model 163: A1
34.2		CAN element in engine control module (N3/10) Resistance		Ignition: OFF Disconnect connector D from test cable and reconnect connector D to N3/10	115 – 125 Ω	N3/10

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
35.0	P1 177 P1 178 P1 179 P1 180 P1 185	Oil sensor (level/temperature/quality) (B40)		Test connection note regarding oscilloscope: Range: 2V Duration: 50ms Test with multimeter only if oscilloscope is not available. Ignition: ON	Signal: see Figure 6 0.3 – 3 V, voltage jumps	⇒ 35.1, oil level, oil quality, wiring, B40
35.1		Voltage supply (B40)		Ignition: ON	4.7 – 5.3 V	N3/10

Electrical Test Program – Sequential Multiport Fuel Injection System Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/remedy
36.0	P0 801 P1 181	With engine/climate control electric cooling fan only Engine/climate control electric cooling fan control module (N76) Activation		Engine: at idle ECT < 70° C Ignition: ON A/C: ON ECT > 85° C	1 – 1.9 V and cooling fan is stationary. 2 – 4 V and cooling fan runs. between 2.5 – 12.5 V and cooling fan speed is based on activation.	Wiring, N76, N3/10
37.0		Diagnosis line Activation		Ignition: ON	11 – 14 V	Wiring, N3/10
38.0	P1 681	Vehicles as of 06/98 Crashsignal		Ignition: ON	< 1 V	Wiring, Readout DTC memory for SRS

Electrical Test Program – Sequential Multiport Fuel Injection System Test

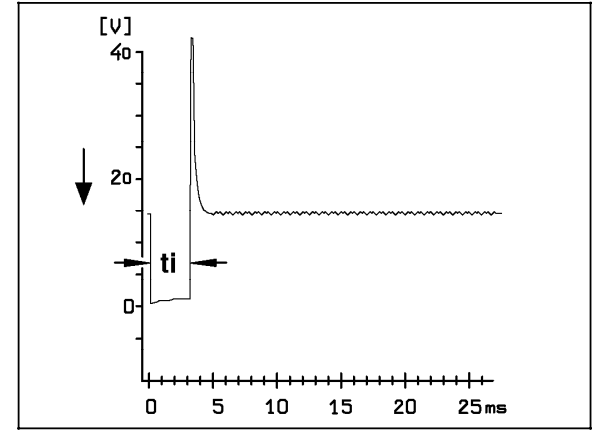
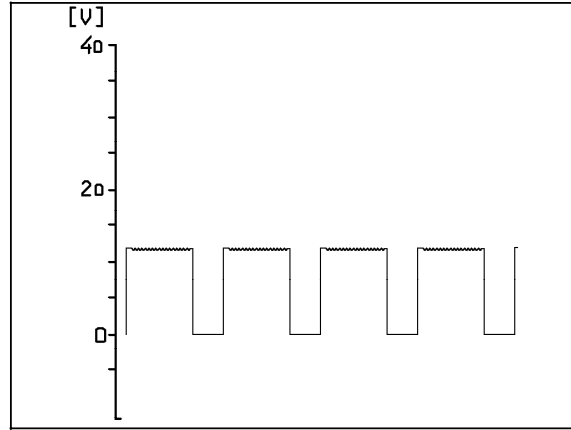
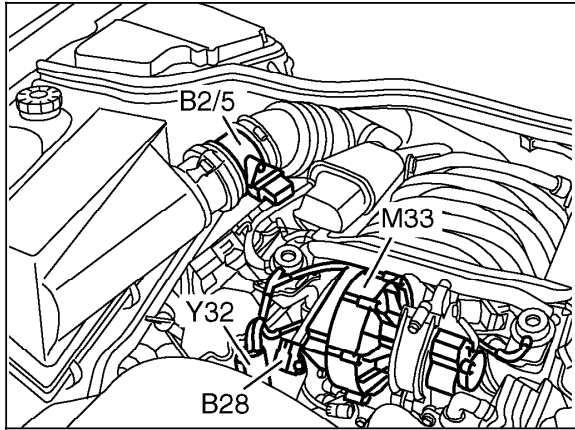
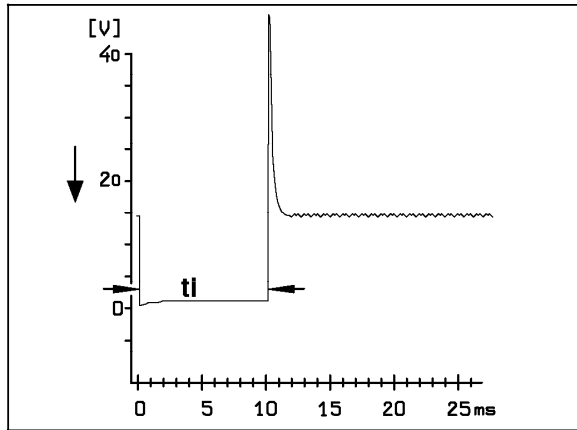


Figure 1
B28 Pressure sensor only (USA)

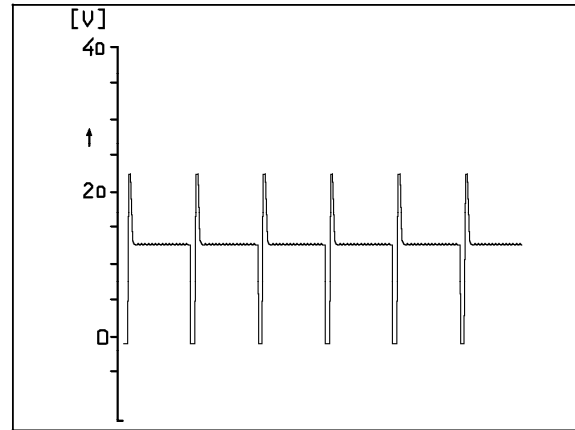
Figure 2
TN signal

Figure 3
Injection duration "ti" at CTP

Electrical Test Program – Sequential Multiport Fuel Injection System Test



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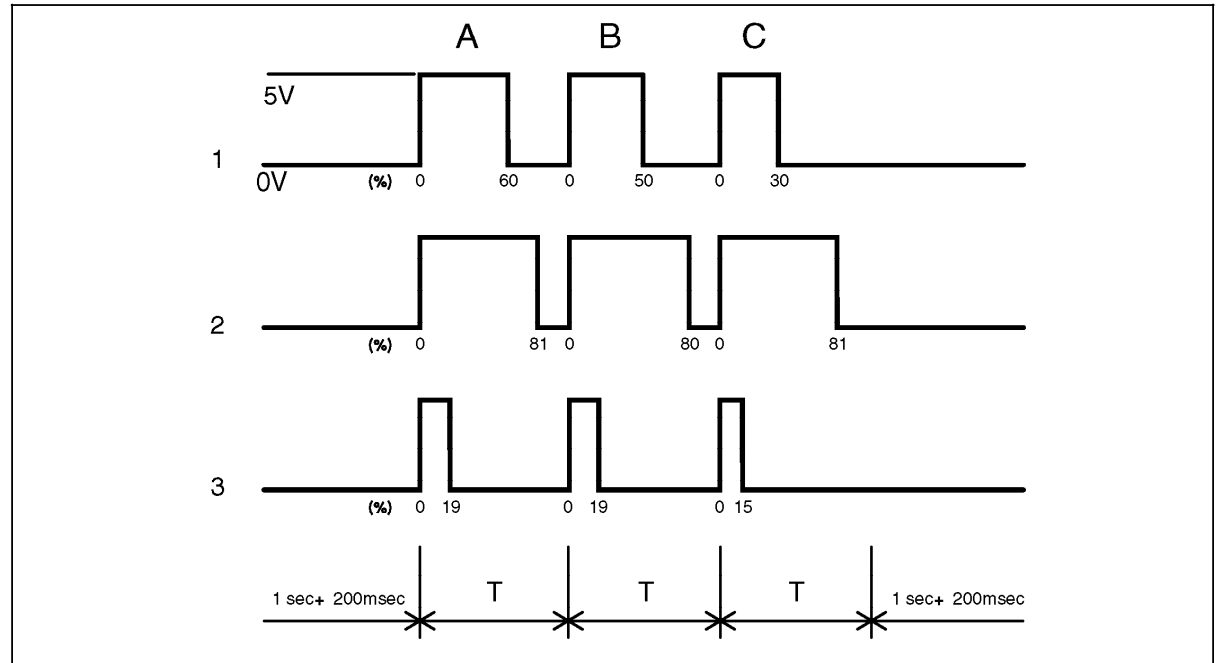


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Figure 4
Injection duration "ti" at WOT

Figure 5
Y58/1 Purge control valve

Electrical Test Program – Sequential Multiport Fuel Injection System Test



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Figure 6

Oil Sensor (B40) Signal Survey

- 1 Sensor signal sensitivity ok
- 2 Sensor signal sensitivity > 80%
 - A Oil temperature > +160° C
 - B Oil level > 80mm
 - C Oil quality good
- 3 Sensor signal sensitivity < 20%
 - A Oil temperature < -40° C
 - B Oil level < 0 mm
 - C Oil quality poor