
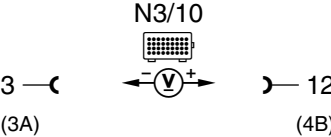
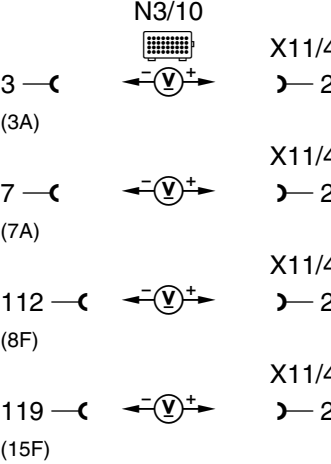

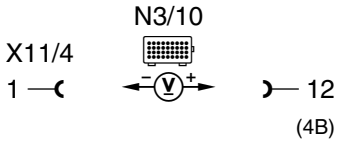
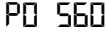
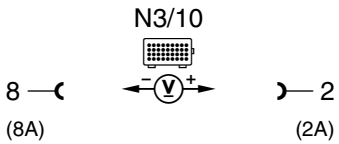
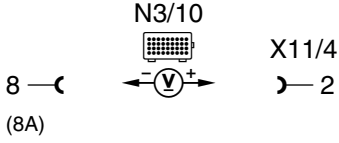
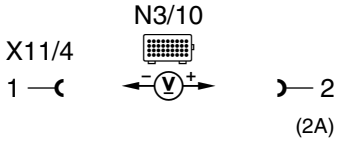



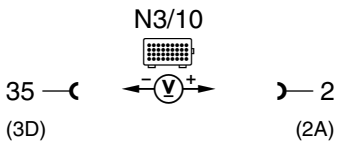
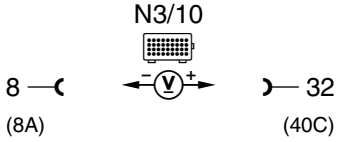
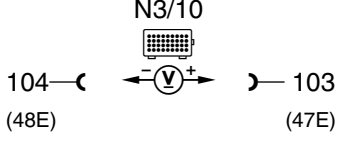
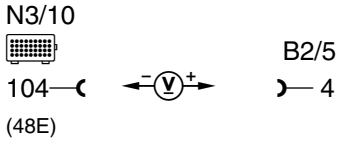
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒   |  | Test scope  | Test connection  | Test condition      | Nominal value | Possible cause/remedy   |
|-----|---|---|--|---------------------|---------------|---|
| 1.0 | P0 560  | <b>Engine control module (ME-SFI) (N3/10)</b><br>Voltage supply<br>Circuit 30 |   | Ignition: <b>ON</b> | 11 – 14 V     | ⇒ 1.1 – 1.2   |
| 1.1 |   | Ground wire   |  | Ignition: <b>ON</b> | 11 – 14 V     | Wiring,<br><b>Model 170 and 202:</b><br>Output ground (W16/6), right component compartment. |


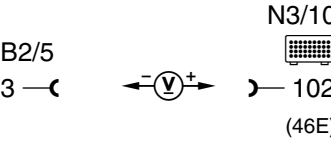
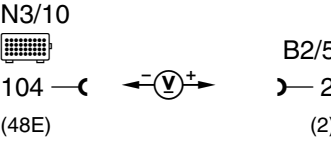
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒   |  | Test scope  | Test connection  | Test condition                              | Nominal value      | Possible cause/remedy  |
|-----|---|---|--|---|--------------------|--|
| 1.2 |   | <b>Voltage supply</b><br><b>Circuit 30</b>  |    | Ignition: <b>ON</b>                         | 11 – 14 V          | Wiring,<br><b>Model 170:</b><br>Relay module (K40).<br><b>Model 202:</b><br>Passenger-side fuse and relay<br>module box (K40/4). |
| 2.0 |  | <b>Engine control module</b><br><b>(ME-SFI) (N3/10)</b><br>Voltage supply<br>Circuit 87 |    | Ignition: <b>ON</b>                         | 11 – 14 V          | ⇒ 2.1 – 2.2  |
| 2.1 |   | Electronics ground  |   | Ignition: <b>ON</b>                         | 11 – 14 V          | Wiring,<br><b>Model 170 and 202:</b><br>Output ground (W16/6), right<br>component compartment.                                   |
| 2.2 |   | Voltage supply<br>Circuit 87  |  | Ignition: <b>ON</b><br>Ignition: <b>OFF</b> | 11 – 14 V<br>< 1 V | Wiring,<br><b>Model 170:</b><br>Relay module (K40).<br><b>Model 202:</b><br>Passenger-side fuse and relay<br>module box (K40/4). |



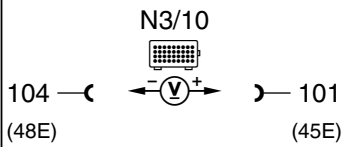
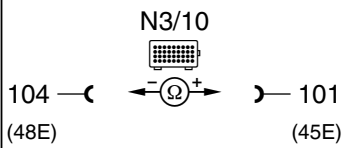
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒   |  | Test scope   | Test connection  | Test condition  | Nominal value  | Possible cause/remedy                                      |
|-----|---|--|--|---|--|--|
| 3.0 | P1 182  | <b>Starter lock-out relay module (N65k2) or K40k2 Model 170, 202 as of 06/97</b><br><br>Activation |    | Engine coolant temperature >20°C<br>Ignition/starter switch: Turn to starter contact briefly.           | 11 – 14 V<br>or if engine does not start, for approx. 5 seconds    | ⇒ 3.1<br>Engine control module (N3/10)                     |
| 3.1 |   | Starter signal<br>Circuit 50   |    | Motor: <b>Start</b>   | 11 – 14 V,<br>while cranking.                                      | Wiring,<br>Ignition switch.                                |
| 4.0 | P0 100  | <b>Hot film MAF sensor (B2/5)</b><br>Hot film signal   |    | Ignition: <b>ON</b><br>Engine: <b>at Idle</b><br><br>Engine coolant temperature >70°C                   | 0.9 – 1.1 V<br>1.3 – 1.7 V<br>Increasing rpm = increasing voltage. | Wiring,<br>⇒ 4.1 – 4.3<br>Air intake system leak,<br>B2/5. |
| 4.1 |   | Hot film MAF sensor (B2/5)<br>Voltage supply 5 V   |  | Disconnect MAF sensor (B2/5) connector and measure directly on socket 4 (br/yl).<br>Ignition: <b>ON</b> | 4.7 – 5.2 V  | Wiring,<br>N3/10   |


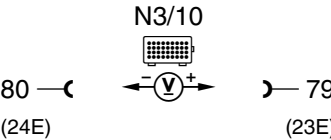
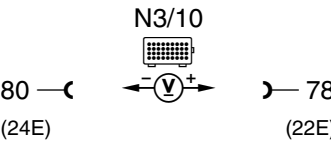
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒   |  | Test scope  | Test connection   | Test condition   | Nominal value | Possible cause/remedy  |
|-----|---|---|---|--|---------------|--|
| 4.2 |   | Ground wire for hot film MAF sensor (B2/5)        |  | Disconnect MAF sensor (B2/5) connector and measure directly on socket 3 (br).<br>Ignition: <b>ON</b>             | 4.7 – 5.2 V   | Wiring.  |
| 4.3 |   | Hot film MAF sensor (B2/5)<br>Voltage supply 12 V |  | Disconnect MAF sensor (B2/5) connector and connect plus of voltmeter to socket 2 (rd/bu).<br>Ignition: <b>ON</b> | 11 – 14 V     | Wiring,<br><b>Model 170:</b><br>Relay module (K40)<br><b>Model 202:</b><br>Passenger-side fuse and relay module box (K40/4). |


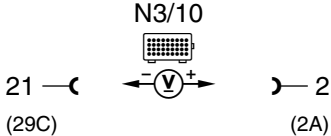
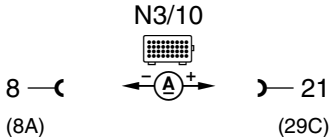
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |     | Test scope   | Test connection  | Test condition  | Nominal value  | Possible cause/remedy |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
|------|--|--|--|---|--|-----------------------|---|----|------|----|------|----|------|----|------|----|-----|----|-----|------|--|-----------------|
| 5.0  | PO  | <b>IAT sensor in hot film MAF sensor (B2/5)</b><br>Voltage |  | Ignition: <b>ON</b>   | <table border="1"> <tr> <th>°C</th> <th>V</th> </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 colspan="2" style="text-align: center;">± 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<br>N3/10  |
| °C   | V  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 10   | 3.1  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 20   | 2.7  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 30   | 2.2  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 40   | 1.8  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 50   | 1.4  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 60   | 1.1  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| ± 5% |  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 5.1  |  | IAT sensor<br>Resistance                                   |  | Ignition: <b>OFF</b><br>Disconnect connector <b>E</b><br>on engine control<br>module (N3/10). | <table border="1"> <tr> <th>°C</th> <th>Ω</th> </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 colspan="2" style="text-align: center;">± 5%</td> </tr> </table> | °C                    | Ω | 10 | 3600 | 20 | 2420 | 30 | 1660 | 40 | 1170 | 50 | 850 | 60 | 600 | ± 5% |  | Wiring,<br>B2/5 |
| °C   | Ω  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 10   | 3600   |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 20   | 2420   |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 30   | 1660   |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 40   | 1170   |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 50   | 850  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| 60   | 600  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |
| ± 5% |  |  |  |   |  |                       |   |    |      |    |      |    |      |    |      |    |     |    |     |      |  |                 |


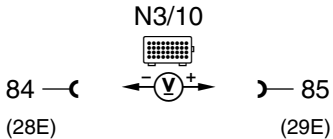
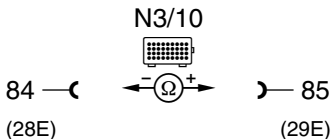
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒   |  | Test scope  | Test connection   | Test condition  | Nominal value   | Possible cause/remedy                    |
|-----|---|---|---|---|---|--|
| 6.0 | P0105   | <b>Pressure sensor (B28)</b><br>Sensor signal<br>(only USA) |  | Connect vacuum tester to pressure sensor (B28) using Y-fitting (Figure 1).<br>Ignition: <b>ON</b><br><br>Engine: <b>at Idle</b> | > 3.5 V<br><br>< 2 V and vacuum climbs to > 500 mbar. | ⇒ 6.1,<br>Vacuum line,<br>Wiring,<br>B28 |
| 6.1 |   | Pressure sensor (B28)<br>Voltage supply<br>(only USA)       |  | Ignition: <b>ON</b>   | 4.7 – 5.3 V   | N3/10                                    |

Electrical Test Program – Sequential Multiport Fuel Injection System Test



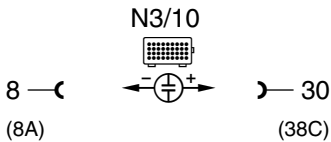
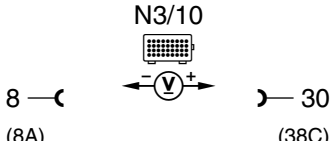
| ⇒   |  | Test scope   | Test connection   | Test condition  | Nominal value  | Possible cause/remedy                  |
|-----|---|--|---|---|--|--|
| 7.0 |   | <p><b>FP relay module Model 170 in relay module (K40)</b></p> <p><b>Model 202: Passenger-side fuse and relay module (K40/4)</b><br/>Activation</p> |    | <p><b>i</b></p> <p>On Model 202 the activation of the fuel pump takes place via the passenger-side fuse and relay module box (K40/4).</p> <p>Ignition: <b>ON</b></p> <p><b>i</b></p> <p>The activation of the FP occurs only once after ignition "ON". For the next activation, the engine must have run briefly.</p> <p>Engine: <b>Start</b></p> | <p>11 – 14 V for approx. 1 sec.</p> <p>11 – 14 V during cranking and while engine runs.</p> <p>0.1 – 0.3 A</p> | <p>Fuse, Wiring, K40, K40/4, N3/10</p> |
|     |   | <p>Current draw K40 or K40/4</p>   |  | <p>Ignition: <b>ON</b></p>  |  |  |

Electrical Test Program – Sequential Multiport Fuel Injection System Test


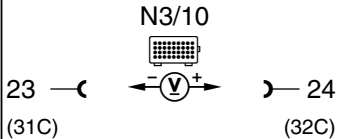
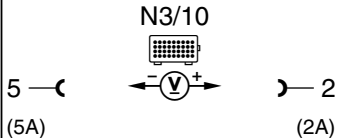
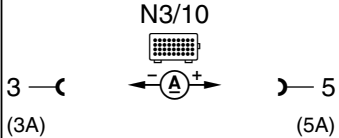
| ⇒   |  | Test scope                           | Test connection   | Test condition  | Nominal value  | Possible cause/remedy |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
|-----|---|--------------------------------------|---|---|--|-----------------------|---|----|------|----|------|----|------|----|-----|----|-----|----|-----|----|-----|----|-----|-----|-----|--|------|------------------|
| 8.0 | P0115   | <b>ECT sensor (B11/4)</b><br>Voltage |  | Ignition: <b>ON</b>   | <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,<br>N3/10  |
| °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 |   | Resistance (B11/4)                   |  | Ignition: <b>OFF</b><br>Disconnect connector <b>E</b><br>on engine control<br>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,<br>⇒ 8.2 |
| °C  | Ω   |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 20  | 3090  |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 30  | 2000  |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 40  | 1330  |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 50  | 900   |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 60  | 630   |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 70  | 440   |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 80  | 320   |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 90  | 230   |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
| 100 | 170   |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |
|     | ±5 %  |                                      |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |                  |



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)<br>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   |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 20  | 3090  |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 30  | 2000  |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 40  | 1330  |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 50  | 900   |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 60  | 630   |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 70  | 440   |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 80  | 320   |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 90  | 230   |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 100 | 170   |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
|     | ±5 %  |  |   |   |  |                       |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |
| 9.0 |   | <b>Engine control module (N3/10)</b><br>TN-signal output | <br> | Test with oscilloscope.<br>Engine: <b>Start</b> or<br>Engine: <b>at Idle</b><br><br>Test with multimeter only<br>if oscilloscope is not<br>available. | Signal, see<br>Figure 2.<br><br><br><br><br><br><br><br><br><br>7.5 – 9.0 V  | Wiring,<br>N3/10      |   |    |      |    |      |    |      |    |     |    |     |    |     |    |     |    |     |     |     |  |      |       |

Electrical Test Program – Sequential Multiport Fuel Injection System Test


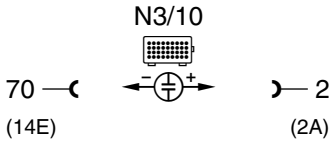
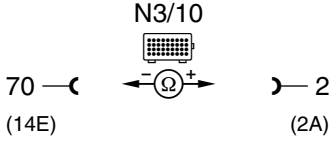
| ⇒    |  | Test scope  | Test connection  | Test condition   | Nominal value  | Possible cause/remedy     |
|------|---|---|--|--|--|---------------------------|
| 10.0 | PO 130<br>PO 133  | <b>O2S 1<br/>(before TWC) (G3/2)</b><br>O2S signal  |   | If ECT > 80 ° C, run engine at idle for at least two minutes.                            | fluctuates from – 0.2 V to + 1.0 V, by more than 0.3 V | Wiring,<br>⇒ 11.0<br>G3/2 |
| 11.0 | PO 135  | <b>O2S 1<br/>(before TWC) (G3/2)</b><br>O2S heater activation<br><br>O2S 1 (G3/2)<br>Current draw | <br> | If ECT > 80 ° C, run engine at idle for at least two minutes.<br><br>Ignition: <b>ON</b> | 11 – 14 V<br><br>0.6 – 3.4 A                           | Wiring,<br>G3/2<br>N3/10  |

Electrical Test Program – Sequential Multiport Fuel Injection System Test


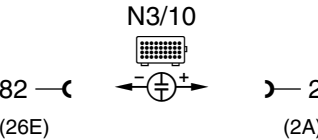
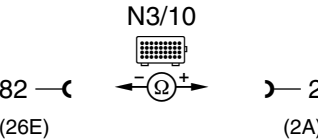
| ⇒    |        | Test scope   | Test connection | Test condition  | Nominal value   | Possible cause/remedy                |
|------|--------|--|-----------------|---|---|--------------------------------------|
| 12.0 | PO 136 | <b>O2S 2 (after TWC) (G3/1)</b><br>O2S signal<br>(only USA)            |                 | If ECT > 80° C,<br>Engine: <b>Start</b><br>Raise and hold engine speed at 2000 – 3000 rpm for approx. 2 minutes.<br><b>Engine at idle:</b><br>Bridge sockets on socket box. | Within one minute, the value range of 450 mV to 500 mV must be either exceed or be below value range given.<br><br>AIR pump runs. Voltage changes to < 40 mV within 60 seconds. | Wiring,<br>⇒ 13.0,<br>G3/1,<br>N3/10 |
| 13.0 | PO 141 | <b>O2S 2 (after TWC) (G3/1)</b><br>O2S heater activation<br>(only USA) |                 | Engine: <b>at Idle</b><br>If ECT > 80° C, run engine at idle for at least 2 minutes.<br><br>Ignition: <b>ON</b>   | 11 – 14 V or voltage fluctuates between 1 – 14 V<br><br>0.6 – 3.4 A   | Wiring,<br>G3/1,<br>N3/10            |
|      |        | O2S 2 (G3/1)<br>Current draw   |                 |   |   |                                      |




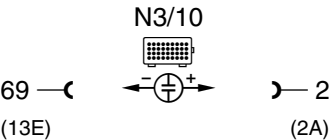
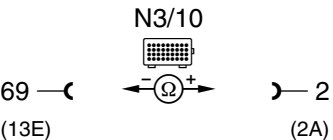
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope   | Test connection  | Test condition   | Nominal value   | Possible cause/remedy   |
|------|---|--|--|--|---|---|
| 15.0 | PO 202  | <b>Injector (Y62y2)</b><br>Activation and injection time<br><br><br><br><br><br><br><br><br>Resistance (Y62y2) | <br><br> | <b>ECT approx. 20° C</b><br>at start:<br><br><b>ECT approx. 80° C</b><br>at idle:<br>accelerate briefly:<br><br><br><br><br>Ignition: <b>OFF</b> | Injection time:<br>approx. 8 ms<br><br><br>approx. 2.7 – 4 ms<br>approx. 14 ms (signal see Figures 3 and 4).<br><br><br>14 – 17 Ω | Fuse,<br>Wiring,<br>Y62y2,<br>N3/10,<br>ECT sensor (B11/4),<br>IAT sensor in hot film MAF sensor (B2/5),<br>O2S 1 (G3/2). |

Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope   | Test connection  | Test condition   | Nominal value   | Possible cause/remedy   |
|------|---|--|--|--|---|---|
| 16.0 | PO 203  | <b>Injector (Y62y3)</b><br>Activation and injection time<br><br><br><br><br><br><br><br><br>Resistance (Y62y3) | <br><br> | <b>ECT approx. 20° C</b><br>at start:<br><br><b>ECT approx. 80° C</b><br>at idle:<br>accelerate briefly:<br><br><br><br><br><br>Ignition: <b>OFF</b> | Injection time:<br>approx. 8 ms<br><br><br>approx. 2.7 – 4 ms<br>approx. 14 ms (signal see Figures 3 and 4).<br><br><br>14 – 17 Ω | Fuse,<br>Wiring,<br>Y62y3,<br>N3/10,<br>ECT sensor (B11/4),<br>IAT sensor in hot film MAF sensor (B2/5),<br>O2S 1 (G3/2). |

Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope   | Test connection  | Test condition   | Nominal value   | Possible cause/remedy  |
|------|---|--|--|--|---|--|
| 17.0 | P0 204  | <b>Injector (Y62y4)</b><br>Activation and injection time<br><br><br><br><br><br><br><br><br>Resistance (Y62y4) | <br><br> | <b>ECT approx. 20° C</b><br>at start:<br><br><b>ECT approx. 80° C</b><br>at idle:<br>accelerate briefly: | Injection time:<br>approx. 8 ms<br><br>approx. 2.7 – 4 ms<br>approx. 14 ms (signal see Figures 3 and 4).<br><br>14 – 17 Ω | Wiring,<br>Y62y4,<br>N3/10,<br>ECT sensor (B11/4),<br>IAT sensor in hot film MAF sensor (B2/5),<br>O2S 1 (G3/2). |


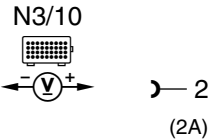
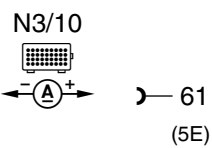

Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |                  | Test scope   | Test connection   | Test condition  | Nominal value  | Possible cause/remedy               |
|------|------------------|--|---|---|--|-------------------------------------|
| 18.0 | PD 410<br>PI 453 | <b>AIR pump relay in passenger-side fuse and relay module box (K40/4), Model 202, without supercharger</b><br>(only USA)<br>Activation<br><br>Current draw (K40/4) | <p>                         N3/10<br/>                         20 —  — 2 (28C)<br/>                         3 —  — 20 (3A)                     </p> | Disconnect ECT sensor (B11/4) connector.<br>Simulate 2.5 kΩ resistance at sockets 1 and 4 with resistance substitution unit.<br>Engine: <b>at Idle</b><br><br>Ignition: <b>ON</b> | 11 – 14 V for approx. two minutes <b>and</b> AIR pump runs.<br><br>0.1 – 0.3 A | Wiring, AIR pump fuse, K40/4, N3/10 |
| 19.0 | PD 410<br>PI 420 | <b>AIR pump switchover valve (Y32)</b><br>(only USA)<br>Activation<br><br>Current draw (Y32)   | <p>                         N3/10<br/>                         66 —  — 2 (10E)<br/>                         3 —  — 66 (3A)                     </p> | Disconnect ECT sensor (B11/4) connector.<br>Simulate 2.5 kΩ resistance at sockets 1 and 4 with resistance substitution unit.<br>Engine: <b>at Idle</b><br><br>Ignition: <b>ON</b> | 11 – 14 V for approx. two minutes <b>and</b> AIR pump runs.<br><br>0.4 – 0.6 A | Fuse, Wiring, Y32, N3/10            |








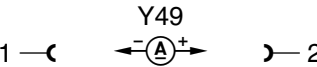
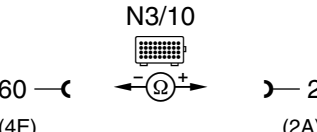
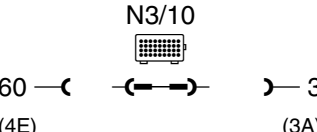
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope  | Test connection   | Test condition   | Nominal value                       | Possible cause/remedy   |
|------|---|---|---|--|-------------------------------------|---|
| 21.0 | PI 400  | <p><b>EGR switchover valve (Y27)</b><br/> <b>Model 202, without supercharger, engine 111.974 (USA)</b><br/>                     Activation</p> <p>Y27<br/>                     Current draw</p> | <p>N3/10<br/> </p> <p>N3/10<br/> </p> | <p>Engine: <b>at Idle</b><br/>                     ECT &gt; 60 °C</p> <p>Accelerate briefly</p> <p>Ignition: <b>ON</b></p>   | <p>11 – 14 V</p> <p>0.3 – 0.5 A</p> | <p>Wiring,<br/>                     Y27,<br/>                     N3/10,<br/>                     ⇒ 22.0 – 23.0</p> |
| 22.0 | PO 400  | <p><b>EGR switchover valve (Y27)</b><br/> <b>Model 202, without supercharger, engine 111.974 (USA)</b><br/>                     Vacuum control</p>  |   | <p> Test connection:<br/>                     Connect vacuum tester to EGR valve.</p> <p>Engine: <b>Start</b><br/>                     and run at &gt; 3000 rpm</p> | <p>&gt; 400 mbar</p>                | <p>Vacuum line,<br/>                     EGR valve,<br/>                     Y27</p>                                |


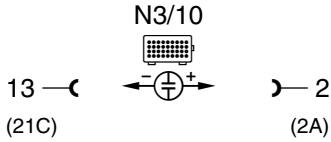
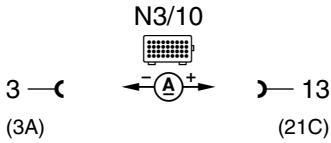
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope   | Test connection | Test condition   | Nominal value  | Possible cause/remedy |
|------|---|--|-----------------|--|--|-----------------------|
| 23.0 | P0400   | <b>EGR switchover valve (Y27)</b><br><b>Model 202, without supercharger, engine 111.974 (USA)</b><br>Mechanical test |                 | <br>Test connection:<br>engine: <b>at Idle</b><br>Apply 500 mbar vacuum to EGR valve.<br><br>Engine: <b>OFF</b><br>Apply 500 mbar vacuum to EGR valve and pull off vacuum hose. | Engine runs uneven.<br><br>EGR valve closes audibly. | EGR valve             |


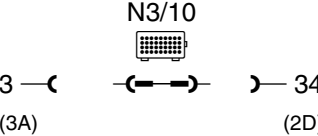
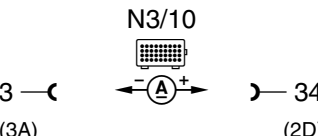
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope  | Test connection  | Test condition   | Nominal value               | Possible cause/remedy   |
|------|---|---|--|--|-----------------------------|---|
| 24.0 | P1 525  | <b>Adjustable camshaft timing solenoid (Y49)</b><br><br>Current draw    |   | <b>Test connection note:</b><br>Connect test cable (102 589 04 63 00) to solenoid.<br><br>Engine: <b>at idle</b><br>ECT > 70°C<br>Increase engine speed to approx. 2000 rpm. | 1.0 – 1.5 A                 | ⇒ 24.1,<br>⇒ 25.0,<br>N3/10   |
| 24.1 |   | Resistance Y49  |   | Ignition: <b>OFF</b>   | 7 – 12 Ω                    | Wiring,<br>Y49  |
| 25.0 | P1 519  | <b>Adjustable camshaft timing solenoid (Y49)</b><br>Mechanical function |  | Engine: <b>at Idle</b><br><br>Bridge sockets on socket box for a maximum of 10 seconds.  | Engine runs rough or stalls | Check function of camshaft adjuster (see SMS, Engine 104, Job No. 05-2160). |





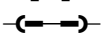


Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope   | Test connection  | Test condition  | Nominal value  | Possible cause/remedy                          |
|------|---|--|--|---|--|--|
| 26.0 | P0440<br>P0441<br>P0443   | <b>Purge control valve (Y58/1)</b><br>Activation<br><br><br><br><br><br><br><br><br>Current draw (Y58/1) | <br><br> | Engine: <b>at Idle</b><br>and at operating temperature.<br><br><br><br><br><br><br><br><br>Ignition: <b>ON</b>  | After approx. 1 minute, purge control valve (Y58/1) must noticeably cycle (Fig. 5 to 6)<br>Signal see Figure 7.<br><br><br><br><br><br><br><br><br>0.3 – 0.5 A | Fuse,<br>Wiring,<br>Y58/1,<br>⇒ 27.0,<br>N3/10 |
| 27.0 | P0440<br>P0441  | <b>Purge control valve (Y58/1)</b><br>Vacuum control   |  | Connect vacuum tester to purge control valve (Y58/1) between purge line to charcoal canister (Figure 5 to 6).<br><br><br><br><br><br><br><br><br>Engine at operating temperature and at idle. | After approx. 1 minute,<br>> 50 mbar and needle oscillates,<br>Y58/1 must cycle.   | Vacuum line,<br>Y58/1                          |


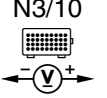
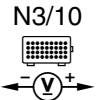
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope   | Test connection  | Test condition  | Nominal value                                    | Possible cause/remedy  |
|------|---|--|--|---|--|--|
| 28.0 | P0440<br>P0442<br>P0446<br>P0455  | <b>Purge system</b><br>System leaks<br><b>Model 170</b> (only USA)<br><b>Model 202</b> (only USA) as of<br><b>09/97</b><br>Activated charcoal canister<br>shut-off valve (Y58/4)<br>Activate |   | Disconnect purge line to charcoal canister on purge control valve (Y58/1). Connect vacuum tester to purge line (Figure 5 and 6).<br><br>Ignition: <b>ON</b><br><br>Apply approx. 25 mbar of vacuum. | After approx. 1 minute,<br>< 5 mbar vacuum loss. | Fuel tank cap,<br>Purge line to charcoal canister,<br>Purge line from charcoal canister to Y58/4,<br>Charcoal canister,<br>Y58/4,<br>Y58/1,<br>Fuel tank pressure sensor (B4/3).<br><br>Charcoal canister,<br>Y58/4,<br>Purge control valve (Y58/1). |
| 29.0 | P0446   | <b>Activated charcoal canister shut-off valve (Y58/4)</b><br><b>Model 170</b> (only USA)<br><b>Model 202</b> (only USA) as of<br><b>09/97</b><br>Current draw                                |  | Ignition: <b>ON</b>   | 0.5 – 0.9 A                                      | Fuse,<br>Wiring,<br>Y58/4  |

Electrical Test Program – Sequential Multiport Fuel Injection System Test


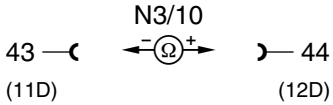
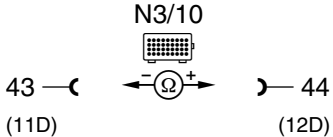
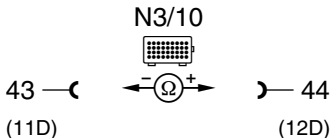
| ⇒    |  | Test scope   | Test connection   | Test condition  | Nominal value          | Possible cause/remedy  |
|------|---|--|---|---|------------------------|--|
| 30.0 | PD 446<br>PD 450<br>PD 455  | <b>Fuel tank pressure sensor (B4/3)</b><br>Model 170 (only USA)<br>Model 202 (only USA) as of 09/97<br>Sender signal<br><br>Activated charcoal canister shut-off valve (Y58/4)<br>Activate | N3/10<br><br>36 —( 37<br>(4D) (5D)<br><br><br>N3/10<br><br>3 —( 34<br>(3A) (2D)<br> | Disconnect purge line to charcoal canister on purge control valve (Y58/1). Connect vacuum tester to purge line (Figure 5 and 6).<br><br>Ignition: <b>ON</b><br><br>Apply approx. 25 mbar of vacuum. | > 2.3 V<br><br>< 2.3 V | ⇒ 30.1,<br>Wiring,<br>Vacuum line,<br>Charcoal canister clogged,<br>B4/3 |
| 30.1 |   | Fuel tank pressure sensor (B4/3)<br>(only USA)<br>Voltage supply   | N3/10<br><br>36 —( 38<br>(4D) (6D)<br>   | Ignition: <b>ON</b>   | 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      |
|------|---|--|---|--|--------------------------------------|----------------------------|
| 31.0 | PO 450  | <b>Purge monitoring pressure sensor (B4/4)</b><br><b>Model 202</b> (only USA)<br><b>up to 08/97</b><br>Sender signal | N3/10<br>  | Disconnect vacuum line at purge monitoring pressure sensor (B4/4). Connect vacuum tester to purge monitoring pressure sensor (Figure 8).<br><br>Ignition: <b>ON</b><br><br>Apply approx. 300 mbar of vacuum. | <br><br><br><br>> 3.5 V<br><br>< 3 V | ⇒ 31.1,<br>Wiring,<br>B4/4 |
| 31.1 |   | Purge monitoring pressure sensor (B4/4)<br>Voltage supply  | N3/10<br> | Ignition: <b>ON</b>  | 4.7 – 5.3 V                          | N3/10                      |




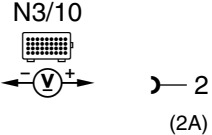
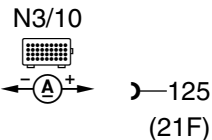
## Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope  | Test connection   | Test condition  | Nominal value | Possible cause/remedy  |
|------|---|---|---|---|---------------|--|
| 32.0 | PD 600<br>PD 811<br>PI 570<br>PI 603<br>PI 747                                    | <b>CAN data bus</b>   | N3/10<br>  | Ignition: <b>OFF</b>  | 55 – 65 Ω     | ⇒ 32.1 – 32.2<br>Data line.  |
| 32.1 |   | CAN element in:<br>Electronic ignition lock<br>control module (N73)<br>or<br>DAS control module (N54/1)<br>Resistance | N3/10<br>  | Ignition: <b>OFF</b><br>Disconnect connector <b>D</b><br>from engine control<br>module (N3/10). | 115 – 125 Ω   | Wiring,<br>Vehicles without EIS:<br>DAS control module (N54/1).<br>Vehicles with EIS:<br>Electronic ignition lock control<br>module (N73). |
| 32.2 |   | CAN element in:<br>Engine control module<br>(N3/10)<br>Resistance   | N3/10<br> | Ignition: <b>OFF</b><br>Disconnect connector <b>D</b><br>from test cable.                       | 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 |
|------|---|-------------------------------------|--|--|--------------------|-----------------------|
| 33.0 | P1 153  | <b>Oil level switch (S43)</b>       | <p style="text-align: center;">N3/10<br/> </p> <p>73 —( (17E)      ←(V)→      )— 2 (2A)</p> | Ignition: <b>ON</b><br><br>Oil level okay.<br>Oil level low. | 11 – 14 V<br>< 1 V | Wiring,<br>S43        |
| 34.0 |   | <b>Diagnosis line</b><br>Activation | <p style="text-align: center;">N3/10<br/> </p> <p>3 —( (3A)      ←(V)→      )— 31 (39C)</p> | Ignition: <b>ON</b>  | 11 – 14 V          | Wiring,<br>N3/10      |



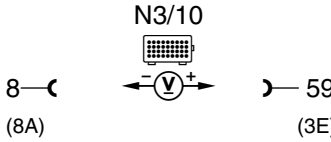

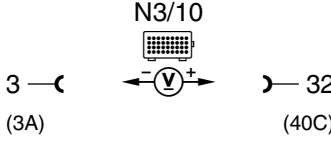
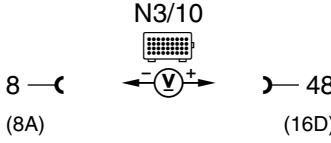
Electrical Test Program – Sequential Multiport Fuel Injection System Test

| ⇒    |  | Test scope   | Test connection   | Test condition  | Nominal value  | Possible cause/remedy   |
|------|---|--|---|---|--|---|
| 35.0 | PO 805<br>PI 235  | <b>Supercharger function</b>   |   | Connect pressure tester to intake manifold.<br>Drive vehicle on dynamometer or road in transm. selector lever in range 3 or 3rd gear if manual trans. with full load at approx. 3500 rpm. | > 280 mbar pressure  | ⇒ 36.0 – 37.0<br>Air flap/air filter actuator (M16/7) binding,<br>Charge air line plugged,<br>Supercharger defective. |
| 36.0 | PO 806<br>PI 236  | <b>Magnetic supercharger clutch (Y2/1)</b><br>Activation<br><br><b>Supercharger only</b><br><br><b>Magnetic supercharger clutch (Y2/1)</b><br>Current draw | <div style="text-align: center;">                     N3/10<br/>  </div> <div style="text-align: center; margin-top: 20px;">                     N3/10<br/>  </div> | Engine: <b>At Idle;</b><br><b>Rapidly depress accelerator pedal (WOT):</b><br><br>Ignition: <b>ON</b>   | 11 – 14 V,<br>as long as the supercharger is engaged.<br><br>2.6 – 4.5 A | Wiring,<br>Y2/1,<br>N3/10   |

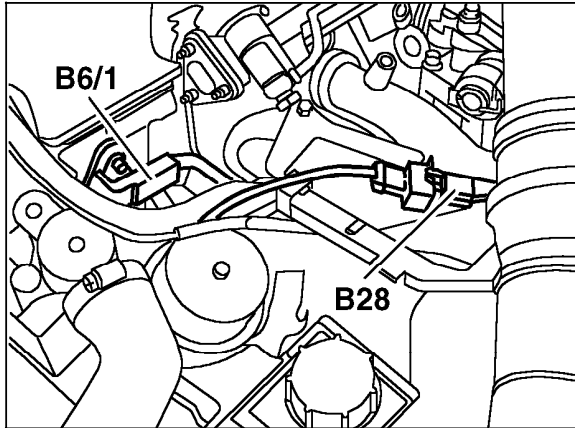
Electrical Test Program – Test

| ⇒    |  | Test scope  | Test connection  | Test condition   | Nominal value  | Possible cause/remedy      |
|------|---|---|--|--|--|----------------------------|
| 37.0 | P0 803<br>P0 243  | <b>Air flap/air filter actuator (M16/7)</b><br>Activation<br><br><b>Supercharger only</b> | N3/10<br> | Ignition: <b>ON</b><br>Engine: <b>At Idle</b> ;<br><b>Rapidly depress accelerator pedal (WOT):</b> | 1.0 – 1.4 V<br><br>2.0 – 12.0 V  | Wiring,<br>M16/7,<br>N3/10 |
| 38.0 | P0 801<br>P1 181  | <b>Engine/climate control electric cooling fan control module (N76)</b><br><br>Activation | N3/10<br> | Engine: <b>at Idle</b><br>ECT < 70 °C<br><br>A/C system: <b>ON</b><br><br>ECT > 85 °C              | 1 – 1.9 V and fan is stopped.<br><br>2 – 6 V and fan runs.<br><br>Between 2.5 – 12.5 V and fan runs according to activation. | Wiring,<br>N76,<br>N3/10   |

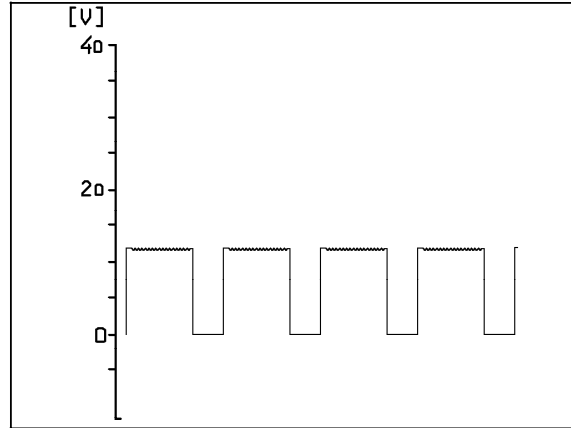
Electrical Test Program – Test

| ⇒    |  | Test scope  | Test connection   | Test condition   | Nominal value  | Possible cause/remedy  |
|------|---|---|---|--|--|--|
| 39.0 | P1 551  | <b>A/C System:</b><br><b>A/C compressor shutoff</b><br>Activation<br>With Tempmatic A/C (only  )                     |    | Engine: <b>At Idle;</b><br><b>Rapidly depress accelerator pedal (WOT):</b><br>(>2,000 rpm) | 11 – 14 V,<br>as long as the A/C compressor is disengaged.                                       | Wiring,<br>Wrong A/C control module installed for A/C system.<br>N3/10 |
| 40.0 |   | <b>Model 170 (only )</b><br><b>with manual transmission</b><br><br><b>Clutch pedal engage/release switch (S40/5)</b> |    | Starter: <b>Engage</b><br>Press clutch pedal:<br><br>Release clutch pedal:                 | 11 – 14 V, and starter motor rotates.<br><br>< 1.0 V, and starter motor stops (does not rotate). | Wiring,<br>S40/5   |
| 41.0 | P1 681  | <b>Vehicles as of 06/98:</b><br><b>Crash signal</b>   |  | Ignition: <b>ON</b>  | < 1.0 V  | Wiring,<br>Readout DTC memory for SRS                                  |

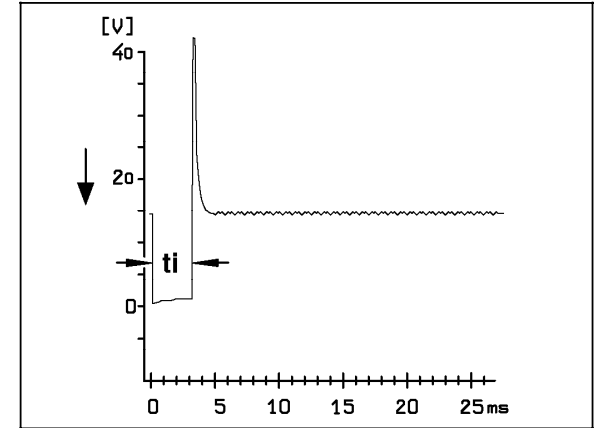
Electrical Test Program – Sequential Multiport Fuel Injection System Test



P07.61-0314-13



P07.61-0537-01



P07.61-0538-01

Figure 1

B28 Pressure sensor (USA only)

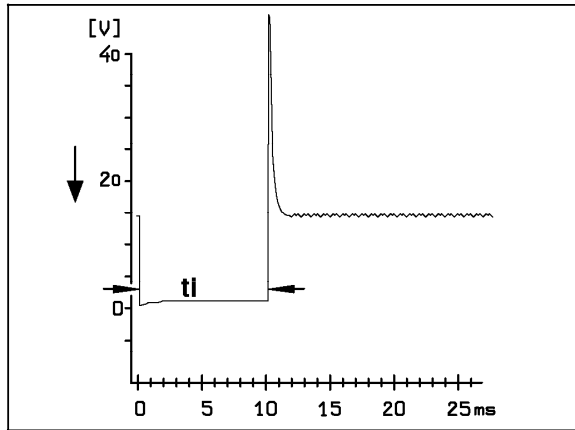
Figure 2

TN signal

Figure 3

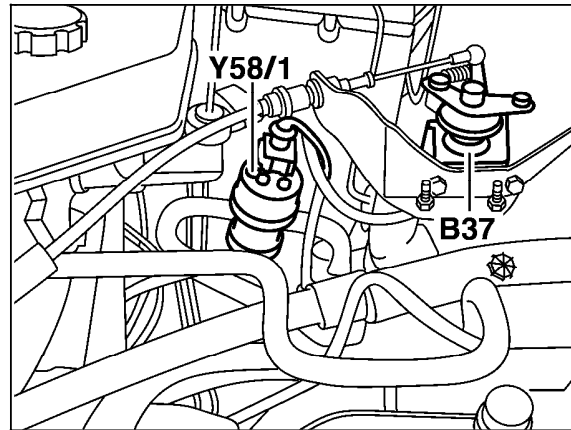
Injection duration "ti" at CTP

Electrical Test Program – Sequential Multiport Fuel Injection System Test



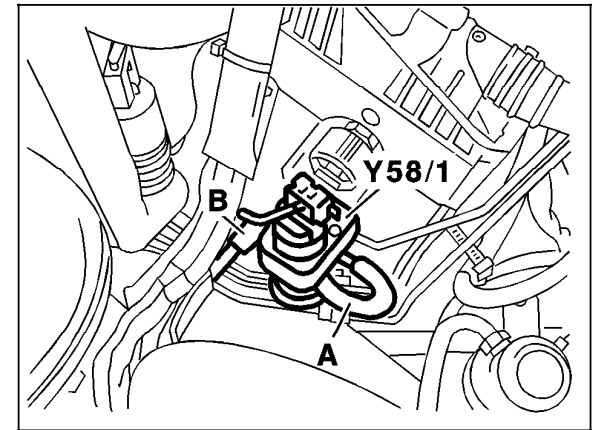
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Figure 4  
Injection duration "ti" at WOT



P07.61-0295-13

Figure 5  
Model 170  
Y58/1 Purge control valve



P07-5947-13

Figure 6  
Model 202  
Y58/1 Purge control valve

Electrical Test Program – Sequential Multiport Fuel Injection System Test

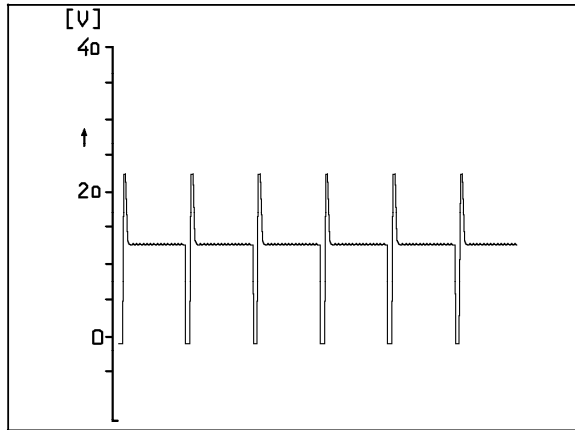


Figure 7  
Purge control valve signal

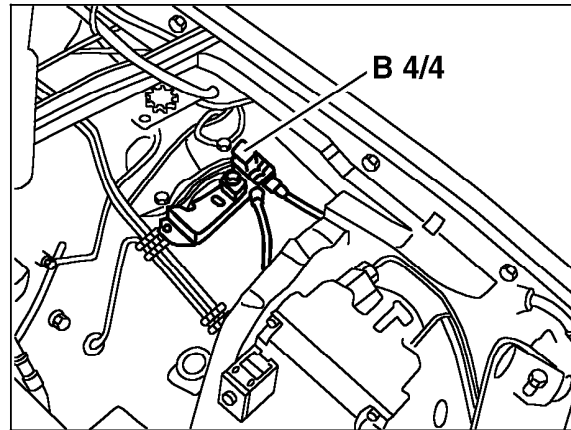


Figure 8  
Model 202  
B4/4 Fuel tank emissions monitoring pressure sensor

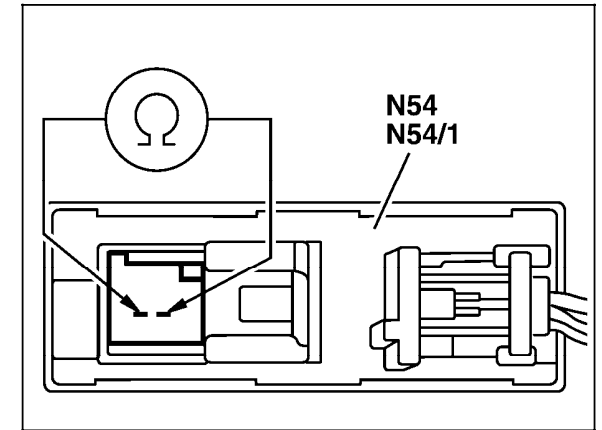


Figure 9  
N54/1 DAS control module