Sequential Multipoint injection 3-4 cyl

Beltrami Marco
Cavriago, 11th October 2011
Electrical Characteristics

- Supply voltage: $V_{\text{batt}} = 10 \div 16\text{V}$

- Working Temperature Range: $-40 \div 105^\circ\text{C}$

- Quiescent current (actuators inhibited): $I_{\text{max}} \leq 0.5\text{A}$

- Quiescent Current in standby: $I_{\text{standby}} \leq 5\text{mA}$

- Injectors: $I_{\text{max}} = 6\text{A}$, $V_{\text{batt,max}} = 16\text{V}$

- Gas Valves (2 output):
  - $P_{\text{max}} = 50\text{W}$, $I_{\text{max}} = 4\text{ A}$ (single common output)
  - $P_{\text{max}} = 25\text{W}$, $I_{\text{max}} = 2\text{ A}$ (two independent output)
- Gas Pressure Sensor: AEB025, new PTM
- MAP Sensor: AEB025, new PTM, Original
- Gas Temperature Sensor: 4K7, 2k2
- Water Temperature Sensor: 4K7, Original
- Gas Level Sensor: AEB, 0-90 Ω, not standard, not standard inverted
- Lambda Probe: 0-1V, 0-5V, 5-0V, 0.8-1.6V
<table>
<thead>
<tr>
<th>Feature</th>
<th>AEB2001NC</th>
<th>AEB2001PC</th>
<th>Monoplug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended map (12x12)</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Progressive petrol to gas switch</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Petrol addition management</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>(idle, addition, high RPM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosys on gas injectors</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Real time diagnosys on petrol injectors</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>connection</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Diagnosys on sensors and change over switch</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Gas injectors enable/disable for diagnostic</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>purpose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPM reading from negative coil or injection</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>time</td>
<td></td>
<td></td>
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</tbody>
</table>
## Monoplug vs other ECUs

<table>
<thead>
<tr>
<th>Feature</th>
<th>AEB2001NC</th>
<th>AEB2001PC</th>
<th>Monoplug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split fuel option</td>
<td>✔</td>
<td>X</td>
<td>✔</td>
</tr>
<tr>
<td>Start &amp; Stop vehicle management</td>
<td>✔</td>
<td>X</td>
<td>✔</td>
</tr>
<tr>
<td>Lambda probe reading and emulation</td>
<td>✔</td>
<td>X</td>
<td>✔</td>
</tr>
<tr>
<td>(two channel)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Multilayer board</td>
<td>✔</td>
<td>X</td>
<td>✔</td>
</tr>
<tr>
<td>Linear Lambda probe emulation</td>
<td>✔</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OBD II parameter reading and visualization</td>
<td>✔</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OBD II Adaptativity</td>
<td>✔</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Low standby current (Iq &lt; 10μA)</td>
<td>✔</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
- Compatibility with actual software ($V>x.x.x$) ✓
- Compatibility with actual configurations ✓
- Compatibility with actual kits ✓
- Compatibility with actual harnesses X
- Compatibility with actual firmwares X
Harness drawing

- Power Supply
- Serial
- Gas Level Sensor
- PTM
- RPM
- EV Gas 1
- Gas Injectors
- Lambda Probe
- Water Temperature
- EV Gas 2
- Petrol cut injectors
- EV Gas 1
- RPM
- Switch
- Harness drawing
Installation drawing
PTM sensor: gas Pressure and Temperature, MAP

- GAS Type: LPG/CNG
- Power Supply: 5 ± 0.2 V
- Map signal Output range: 0.5 ÷ 4.5 V
- Pressure signal Output range: 0.5 ÷ 4.5 V
- Temperature range: -40 ÷ 125°C
- Maximum Gas Pressure: 4.5 Bar
New PTM sensor: Mechanical installation

- Pressure Reducer
- Manifold Pressure (MAP)
- PTM Sensor (Pressure Temperature MAP)
- Intake manifold
- GAS Injectors
- Out GAS
Two Injectors families
- Aluminum
- Polymer

- Both version accept different hole size on same body
- High pressure up to 7 bar CNG
- Easy maintenance
- Cost/performance ratio
- Polymer version has better performances (repeatability, cold conditions, endurance)

Aluminum version with integrated sensor

Polymer version