Installation manual

General

PART 1/2
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Maintenance instructions

Checklist after installation
Required equipment / tools / materials for installing a complete system

- Complete workshop toolbox (wrenches, screwdrivers, cutters, pliers, ratchet, sockets)
- Car lift
- Portable computer: operating on Windows 98, W2000 or XP
  - Internal memory: 16 Mb or more
  - Memory HD space: 5MB
  - Screen: 256 colours, advise colours 16 bits or more
  - Com port: 1 free COM port 1 or COM port 2 with a 9 or 25 pins connector or USB

- Vehicle fuel system scan tool or OBD scan tool Prins (part nr. 099/9928)
- Exhaust gas analyser
- Multimeter
- Oscilloscope
- Prins VSI diagnostic software
- Prins VSI serial interface
- Prins VSI break out box (part nr. 080/70090)
- Torque wrench (10Nm)
- Portable light
- Assortment drill bits 4 to 12 mm
- Assortment cutters (ø 20, 30, 50, 70 mm)
- Punching tool ø 70 mm
- Round file
- Portable drill or pneumatic drill
- Threading device (male M6x1, M8x1, M10x1)
- Pipe-flaring tool (for 6 and 8 mm copper pipe)
- Air gun
- Vacuum cleaner
- Hot air gun
- Allan spanner for inlet couplings 3,5mm (part nr. 099/9970)
- Reducer adjustment tool (part nr. 099/9960)
- Molex extraction tool for VSI switch connector (part nr. 090/9929)
- Soldering iron, soldering tin
- Wire-stripping pliers
- Adhesive tape
- Adhesive sealant
- Thread locking compound
- Anti-corrosion agent / black body coating
- Gas leak detection device or foam leak spray
- Shrink sleeves
- Engine coolant

Vehicle check

- Check the vehicle drivability on petrol
- Check the fuel system for error codes (scan tool)
- Check if the catalytic converter is in good condition (exhaust gas analyzer)
- Check the condition of the ignition system (spark plugs, cables, coil)
General instructions

- The installation of the system shall be done in accordance with the installation manual provided by Prins Autogassystemen.
- Always disconnect the battery when installing the LPG/CNG system.
- Do not place the main fuse into the fuse holder before having completed the installation of the VSI system.
- The VSI computer has to be activated by means of the diagnosis software.
- In the unlikely event the VSI computer fails, it will automatically switch over to petrol. Never disconnect the VSI computer connector, unless you have removed the main fuse.
- When installing the VSI wiring harness, ensure that it does not run near any of the ignition components.
- Solder and insulate all electrical connections. The wires in the loom are provided with numbers and text. The text on the wire explains the function of the wire. The wire loom is not model specific, therefore it may be necessary to adjust the length of the wires. Ensure maximum care is taken when connecting wiring. Make professional joints using solder and shrink sleeve. Do not stretch the wiring harness.
- No component of the LPG/CNG-system shall be located within 100 mm of the exhaust or similar heat source, unless such components are adequately shielded against heat.
- Remove any internal burrs, after having shortened the LPG/CNG hose. (This guarantees the maximum flow through the hose without pollution.)
- If holes have to be drilled (wear safety glasses) in order to facilitate mounting the device frame, the reservoir frame, the LPG/CNG cut-off valve, etc., the drilled holes must always be treated with an anti-corrosive, after the burrs have been removed (especially when mounting an exterior filler).
- After having completed the installation, check the whole system for gas leakage; use a gas leak detection device.
- Fitting and maintenance is only allowed by Prins Autogassystemen selected LPG/CNG engineers.
- Prins Autogassystemen is not responsible for any damages to people or objects as a result of changes to Prins products.
- Check our website regularly for updates, info-bulletins and product information. (www.prinsautogassystemen.com)
- For installing a dedicated VSI-system download DEDICATED MANUAL (part 2/2)

Please fill in the warranty card completely and return it within 8 days after installation.
Introduction

VSI stands for “vapour sequential injection”, it points directly to the most important properties of the system. This second-generation gas injection system is based on a vapour LPG/CNG injection that is injected sequentially in the engine. Sequential means that the gas injectors will inject the LPG/CNG in the sequence equal to the injection sequence of the petrol injectors. This sequence in most applications is equal to the firing order of the ignition sequence of the engine, for example with a 4-cylinder engine this is normally 1-3-4-2. Sequential injection means that the amount of injected fuel per cylinder can be metered and timed individually.

This achieves a much higher level of performance emission and drivability. The VSI system was designed and developed in-house by Prins Autogassystemen B.V.

VSI characterizes itself with a high level of integration into the petrol management system. The two systems integrate as “master-slave” system. This means that the original petrol management ECM controls the amount of LPG/CNG injected via the gas injectors into the engine. The VSI ECM only translates the relevant signals coming from the engine management system necessary for MASTER / SLAVE strategy. Following this strategy the petrol management system is the “MASTER” and the VSI ECM the “SLAVE”. The advantage of this strategy: while driving on LPG/CNG the lambda control and OBD functions keep within the OE parameters, functioning correctly and controlled by the petrol management system. So when operating on LPG/CNG it is not necessary to generate simulated signals.

There is one exception made for the petrol injector signals, while driving on LPG/CNG the petrol injector’s are switched off to discontinue the petrol supply. To maintain the injection control signals it is necessary to simulate the petrol injectors to ensure the original ECM does not detect a fault code. Secondly when operating on LPG/CNG it is necessary to maintain a petrol injector control signal to measure the required fuel demand.

The second generation injection system VSI has the ability to inject sequentially making it quicker and more accurate, large benefits can be gained in engine and emission performance.
**Approval numbers VSI LPG / CNG components**

<table>
<thead>
<tr>
<th>Mark</th>
<th>Component</th>
<th>LPG</th>
<th>CNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prins</td>
<td>VSI Reducer</td>
<td>E4-67R-010054</td>
<td></td>
</tr>
<tr>
<td>Valtec</td>
<td>6 / 8mm lock-off valve</td>
<td>E4-67R-010041</td>
<td></td>
</tr>
<tr>
<td>Keihin</td>
<td>Regulator</td>
<td>E4-110R-000092</td>
<td>E4-110R-000095</td>
</tr>
<tr>
<td>OMB</td>
<td>lock-off valve</td>
<td>E4-110R-000190</td>
<td></td>
</tr>
<tr>
<td>Wika</td>
<td>CNG Pressure indicator</td>
<td>E4-110R-000021</td>
<td></td>
</tr>
<tr>
<td>Prins</td>
<td>VSI Injector rail</td>
<td>E4-67R-010093</td>
<td>E4-110R-000021</td>
</tr>
<tr>
<td>Keihin</td>
<td>VSI Injector</td>
<td>E4-67R-010092</td>
<td>E4-110R-000020</td>
</tr>
<tr>
<td>Prins</td>
<td>Filter unit</td>
<td>E4-110R-000028</td>
<td></td>
</tr>
<tr>
<td>Keihin</td>
<td>Filter unit</td>
<td>E4-67R-010177</td>
<td>E4-110R-000091</td>
</tr>
<tr>
<td>Prins</td>
<td>ECU</td>
<td>E4-67R-010098</td>
<td>E4-110R-000083</td>
</tr>
</tbody>
</table>

### Electrical VSI components

**VSI-1 LPG**

![VSI-1 LPG Diagram](image)

**VSI-2.0 LPG / VSI-2.0 DI LPG**

![VSI-2.0 LPG / VSI-2.0 DI LPG Diagram](image)

**VSI-1 CNG**

![VSI-1 CNG Diagram](image)

**VSI-2.0 CNG / VSI-2.0 DI CNG**

![VSI-2.0 CNG / VSI-2.0 DI CNG Diagram](image)
The Prins LPG reducer

- Mount the reducer to the body of the vehicle in the engine compartment, never on the engine!
- Mount the reducer so that it is easy to adjust the pressure.
- Install the supplied 8 mm threaded end in the back cover of the reducer.
- Mount the reducer as shown in the drawing.
- Mount the reducer on a bracket and bolt on with a M8x1 nut.
- The LPG lock-off valve can be installed in different positions. Do not damage the O-rings when rotating the lock-off valve. See picture for torque moment.
- The reducer is connected to the heating system circuit by couplings between the coolant fluid hoses: dependant on the converted vehicle the reducer is placed in series or in parallel with the heating system.
- Overpressure 5mm relief hose: connect to the intake manifold.
- No component of the LPG-system shall be located within 100 mm of the exhaust or similar heat source, unless such components are adequately shielded against heat.
- The pressure can be adjusted with the adjusting screw (Allan screw) in the front cover.
- Seal the adjusting screw, with the sticker, in the front cover of the reducer after adjusting the pressure.

![mounting positions](image)

Standard reducer, 6 mm LPG pipe, used for engines with a HP up to 135 kW (180 HP).
High Output reducer, 8 mm LPG pipe, used for engines with a HP over 135 kW (180 HP).
Use a High Output MAP reducer on blown engines (turbo / compressor)

![NO threat locking compound allowed](image)
The Keihin CNG regulator

- Mount the Keihin regulator to the body of the vehicle in the engine compartment, never on the engine!
- Mount the regulator so that it is easy to replace the inlet filter.
- Mount the regulator as shown in the drawing with the water connections downwards.
- Mount the regulator on a bracket and bolt on with 3 M6x1 nuts.
- The regulator is connected to the heating system circuit by couplings between the coolant fluid hoses.
- Optional MAP connection: connect to the intake manifold if needed.
- No component of the CNG-system shall be located within 100 mm of the exhaust or similar heat source, unless such components are adequately shielded against heat.
- The pressure may not be adjusted and is fixed on 3.3 bar.
The injector rail

The Prins injector rail is available in 2 - 3 - 4 - 5 rail versions.

Guideline VSI injector choice: divide total engine power in kW up into the amount of cylinders.

**LPG:**

<table>
<thead>
<tr>
<th>Color ID (KN-8)</th>
<th>Injector size</th>
<th>Minimum power per cylinder [LPG]</th>
<th>Maximum power per cylinder [LPG]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>kW</td>
<td>HP</td>
</tr>
<tr>
<td>Green</td>
<td>32cc/stroke</td>
<td>13.0</td>
<td>17.4</td>
</tr>
<tr>
<td>White</td>
<td>42cc/stroke</td>
<td>9.0</td>
<td>12.1</td>
</tr>
<tr>
<td>Blue</td>
<td>52cc/stroke</td>
<td>13.0</td>
<td>17.4</td>
</tr>
<tr>
<td>Orange</td>
<td>63cc/stroke</td>
<td>18.0</td>
<td>24.1</td>
</tr>
<tr>
<td>Yellow</td>
<td>73cc/stroke</td>
<td>25.0</td>
<td>33.5</td>
</tr>
<tr>
<td></td>
<td>82cc/stroke</td>
<td>28.0</td>
<td>37.6</td>
</tr>
<tr>
<td>Brown</td>
<td>100cc/stroke</td>
<td>31.0</td>
<td>41.6</td>
</tr>
</tbody>
</table>

**CNG:**

<table>
<thead>
<tr>
<th>Color ID (KN-8)</th>
<th>Injector size</th>
<th>Minimum power per cylinder [CNG]</th>
<th>Maximum power per cylinder [CNG]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>kW</td>
<td>HP</td>
</tr>
<tr>
<td>Green</td>
<td></td>
<td>9.0</td>
<td>12.1</td>
</tr>
<tr>
<td>White</td>
<td>42cc/stroke</td>
<td>7.0</td>
<td>9.4</td>
</tr>
<tr>
<td>Blue</td>
<td>52cc/stroke</td>
<td>10.0</td>
<td>13.4</td>
</tr>
<tr>
<td>Orange</td>
<td>63cc/stroke</td>
<td>14.0</td>
<td>18.8</td>
</tr>
<tr>
<td>Yellow</td>
<td>73cc/stroke</td>
<td>20.0</td>
<td>26.8</td>
</tr>
<tr>
<td></td>
<td>82cc/stroke</td>
<td>23.0</td>
<td>30.8</td>
</tr>
<tr>
<td>Brown</td>
<td>100cc/stroke</td>
<td>25</td>
<td>33.5</td>
</tr>
</tbody>
</table>
The Prins filter unit

The filter unit filters the LPG/CNG and is also used to measure the gas temperature (T_gas) and gas pressure (Psys) in the VSI system, by means of a combination sensor. The filter unit has a single or a double outlet of 11mm.

- Single outlet: on converted vehicle with 3-4 or 5 cylinder engines with one VSI injector rail.
- Double outlet: on converted vehicle with 6 or 8 cylinder engines with two VSI injector rails.

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The Keihin filter unit

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The VSI computer

The VSI computer can be mounted into the engine room as well as inside the car, depending on the converted vehicle.

Never mount the computer near a heat source.

Never mount the computer upside down.

Never clean engine room with a high pressure cleaner.

VSI-I
VSI-2.0 computer

The Prins VSI-2.0 computer is the second generation master-slave management system. This new design has distinctive features and will be used as a new platform for current and future Prins injection systems.

<table>
<thead>
<tr>
<th>Connector B</th>
<th>Connector A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pin</strong></td>
<td><strong>Vol wire</strong></td>
</tr>
<tr>
<td>1</td>
<td>-GAS IN 1</td>
</tr>
<tr>
<td>2</td>
<td>-GAS IN 2</td>
</tr>
<tr>
<td>3</td>
<td>-GAS IN 1</td>
</tr>
<tr>
<td>4</td>
<td>-GAS IN 2</td>
</tr>
<tr>
<td>5</td>
<td>-GAS IN 1</td>
</tr>
<tr>
<td>6</td>
<td>-GAS IN 2</td>
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<tr>
<td>7</td>
<td>-GAS IN 1</td>
</tr>
<tr>
<td>8</td>
<td>-GAS IN 2</td>
</tr>
<tr>
<td>9</td>
<td>-GAS IN 1</td>
</tr>
<tr>
<td>10</td>
<td>-GAS IN 2</td>
</tr>
<tr>
<td>11</td>
<td>-GAS IN 1</td>
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<tr>
<td>12</td>
<td>-GAS IN 2</td>
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<td>-GAS IN 1</td>
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<tr>
<td>18</td>
<td>-GAS IN 2</td>
</tr>
<tr>
<td>19</td>
<td>-GAS IN 1</td>
</tr>
<tr>
<td>20</td>
<td>-GAS IN 2</td>
</tr>
</tbody>
</table>
Instructions rotating the Prins VSI injector rail

This is an instruction how to convert a “right” rail into a “left” injector rail

Tools:
- Ring spanner size 13 mm
- Torque spanner (0-3 Nm)

Disassembly / assembly:

1. Unscrew both M8 (4) nuts.
2. Remove the strip (2).
3. Remove the injectors (10) with a rotating movement out of the fuel rail (1).
4. Rotate the rail (1) 180 degrees.
5. Mount the injectors (10) with a rotating movement into the fuel rail (1).
6. Mount the strip (2) on the injectors (10).
7. Tighten the strip (2) with two M8 nuts (4). Tightening moment 2.5 Nm.
The wiring loom.

The cables in the loom are provided with numbers and text. The text on the cable explains the function of the wire. The wire loom is not model specific, therefore is it may be necessary to adjust the length of the wires.

The watertight ECM housing is made from aluminium; this material is chosen for its excellent heat dissipation qualities, necessary for cool the injector drivers. Always fix the computer in the coolest place in the engine compartment.

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All cable numbers correspond with a position numbered on the connector.
Example wire number 4 is mounted on connector position 4.

Ensure maximum care is taken when connecting wiring.
Make professional solder joints and insulate the joints.
Do not stretch the wiring harness.

VSI-I

The wiring harness is equipped with a 56 position interlocking connector which slots into the VSI computer. Pull the purple interlocking clip and push the connector into the VSI computer, push the clip back into its original position, the connector is now locked into the VSI computer.

VSI-2.0

The wiring harness connects to the computer via two Bosch a 81+40 pins connector which is locked to the VSI-2.0 computer by means of connector clamping mechanism.
Hose connections

Try to keep the inlet manifold hoses as short as possible.
Use a hose clamp on all the LPG/CNG hose connections.
Please observe that there is no damage or fouling to the hoses.
Diagram 1 VSI inlet manifold coupling
Diagram 2 VSI inlet manifold coupling with nylon hose

VSI injector
Hose clamp
LPG hose
Hose clamp
Nylon hose
Nut
Barrel
Coupling
VSI inlet manifold coupling with nylon hose
Inlet manifold
Petrol injector
Exhaust manifold
Oxygen sensor
Diagram 3 Parallel water connection
Diagram 4 Serial water connection
Diagram 5 Serial water connection CNG regulator
The VSI-I fuel switch

Mount the switch on a visible and approachable place for the driver.
When mounting the switch, only push on its sides.
Pushing the switch in the centre may result in damage to the switch.

ELECTRICAL CONNECTION OF THE LPG SWITCH with **loose** beeper

ELECTRICAL CONNECTION OF THE LPG SWITCH with **internal** beeper

ELECTRICAL CONNECTION OF THE CNG SWITCH with **internal** beeper

The LPG VSI switch with internal beepers is programmable for different types of tank indicators.
Standard setting of the switch is 0-95 Ohm.
For reprogramming the switch:
1. Make sure that the ignition switch is turned off.
2. Place the VSI main fuse.
3. Push the switch for 5 seconds until a signal sounds (beep).
4. Make a choice immediately:
   - push 1 x for 0-95 Ohm tank indicator
   - push 2 x for Hall tank indicator
   (push 3 x preparation VSI2, not used)
5. The VSI switch will confirm the choice with a beep signal (1 or 2 signals)
To change the choice of indicator: remove the VSI main fuse and start with step 1.
The CNG switch is not programmable. The CNG switch is not exchangeable with a LPG switch!
The VSI-2.0 fuel switch

The VSI-2.0 switch is designed for the new VSI-2.0 platform. The switch is controlled by the VSI-2.0 computer through LIN communication.

---

<table>
<thead>
<tr>
<th>Operation mode</th>
<th>Fuel selection</th>
<th>Active fuel</th>
<th>Status LED</th>
<th>Tank LEDs</th>
<th>Beeper</th>
<th>Diagnose/system check LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine off</td>
<td>GAS/Petrol</td>
<td>No</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Contact+ on/engine of</td>
<td>Petrol</td>
<td>No</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>on 3 sec (system check)</td>
</tr>
<tr>
<td>Contact+ on/engine of</td>
<td>Gas</td>
<td>No</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>on 3 sec (system check)</td>
</tr>
<tr>
<td>Engine on</td>
<td>Petrol</td>
<td>Petrol</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Gas standby</td>
<td>Gas</td>
<td>Petrol</td>
<td>flashing 1.0Hz</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Gas mode</td>
<td>Gas</td>
<td>Gas</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Tank empty, switched back to petrol mode</td>
<td>Gas</td>
<td>Petrol</td>
<td>flashing 1.0Hz</td>
<td>LED 1 1.0Hz</td>
<td>3x0.5Hz</td>
<td>Off</td>
</tr>
<tr>
<td>Critical fault</td>
<td>Petrol</td>
<td>Petrol</td>
<td>Off</td>
<td>Led1 on</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Non critical fault, petrol mode</td>
<td>Petrol</td>
<td>Petrol</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>Non critical fault, gas mode</td>
<td>Petrol</td>
<td>Petrol</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Flashing 1.0 Hz</td>
</tr>
</tbody>
</table>

---
Electrical connections on the LPG reservoir

The wire harness contains the wires for connecting the LPG reservoir. Refer to the following diagram when connecting the LPG reservoir.

SOLDER THE CONNECTIONS IN THE FITTING BOX AND PROTECT THEM WITH A SHRINK SLEEVE.
**Electrical connections VSI-I wiring harness**

Check and measure the wiring in case of changes in the cars wiring colours.

<table>
<thead>
<tr>
<th>Wire number / code</th>
<th>Wire colour</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 MAIN GND</td>
<td>brown</td>
<td>Connect to the ‘-‘ of the battery; use a ring terminal for this purpose.</td>
</tr>
<tr>
<td>25-51 +12V BAT</td>
<td>red</td>
<td>Connect to the ‘+‘ of the battery; use a ring terminal for this purpose or solder. Do not place the main fuse into the fuse holder before having completed the installation of the system.</td>
</tr>
<tr>
<td>50 LPG/CNG VLV GND</td>
<td>brown</td>
<td>Ground shut-off valve. 2-pole connector shut-off valve.</td>
</tr>
<tr>
<td>53 + LPG/CNG VLV</td>
<td>yellow - green</td>
<td>Power supply shut-off valve.</td>
</tr>
<tr>
<td>42 ECT GND</td>
<td>brown</td>
<td>Ground ECT sensor. 2-pole black connector temperature sensor in the evaporator.</td>
</tr>
<tr>
<td>43 ECT</td>
<td>grey</td>
<td>ECT measurement.</td>
</tr>
<tr>
<td>22 RS232 TxD</td>
<td>grey</td>
<td>4-pole black connector diagnosis wire connection.</td>
</tr>
<tr>
<td>23 RS232 RxD</td>
<td>grey</td>
<td></td>
</tr>
<tr>
<td>50 DIAGNOSE GND</td>
<td>brown</td>
<td></td>
</tr>
<tr>
<td>51 +12V DIAG</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>15 T LPG</td>
<td>grey</td>
<td>4-pole black connector filter unit connection.</td>
</tr>
<tr>
<td>17 + 5V Psys</td>
<td>pale green</td>
<td></td>
</tr>
<tr>
<td>18 Psys GND</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>brown</td>
<td></td>
</tr>
<tr>
<td>33 33G INJ OUT 1</td>
<td>white - yellow</td>
<td>Connector VSI-injector to cylinder 1.</td>
</tr>
<tr>
<td>34 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>32 32G INJ OUT 2</td>
<td>green - yellow</td>
<td>Connector VSI-injector to cylinder 2.</td>
</tr>
<tr>
<td>34 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>31 31G INJ OUT 3</td>
<td>pink - yellow</td>
<td>Connector VSI-injector to cylinder 3.</td>
</tr>
<tr>
<td>34 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>30 30G INJ OUT 4</td>
<td>blue - yellow</td>
<td>Connector VSI-injector to cylinder 4.</td>
</tr>
<tr>
<td>34 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>5 5G INJ OUT 5</td>
<td>grey - yellow</td>
<td>Connector VSI-injector to cylinder 5.</td>
</tr>
<tr>
<td>6 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>4 4G INJ OUT 6</td>
<td>brown - yellow</td>
<td>Connector VSI-injector to cylinder 6.</td>
</tr>
<tr>
<td>6 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>3 3G INJ OUT 7</td>
<td>light blue - yellow</td>
<td>Connector VSI-injector to cylinder 7.</td>
</tr>
<tr>
<td>6 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>2 2G INJ OUT 8</td>
<td>red - yellow</td>
<td>Connector VSI-injector to cylinder 8.</td>
</tr>
<tr>
<td>6 34 G INJ A PLUS</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>44 AD1</td>
<td>green</td>
<td>Option, programmable input</td>
</tr>
<tr>
<td>16 MAP</td>
<td>blue</td>
<td>For measuring the inlet manifold pressure (MAP). In combination with Prins Turbo/MAP sensor.</td>
</tr>
<tr>
<td>18 + 5V MAP</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>42 MAP GND</td>
<td>brown</td>
<td></td>
</tr>
<tr>
<td>PTO CRANK-D</td>
<td>purple / purple-yellow</td>
<td>For interrupting the crank signal on CNG.</td>
</tr>
<tr>
<td>50 Ground + CNG</td>
<td>blue</td>
<td>For measuring the high pressure signal of the CNG system In combination with Prins High Pressure gauge</td>
</tr>
<tr>
<td>53 Signal</td>
<td>green-yellow blue</td>
<td></td>
</tr>
</tbody>
</table>
Electrical connections VSI-I wiring harness

Check and measure the wiring in case of changes in the cars wiring colors.

| 13 | IGNITION + | grey-white | Make a connection to ignition + / contact +. Make sure that the voltage will not fail during starting the engine. |
| 46 | LAMBDA 1-L | orange     | For the measurement of the lambda signal of cylinder bank 1. Connect the wire parallel to the lambda sensor signal wire. |
| 45 | LAMBDA 2-R | orange-white | For the measurement of the lambda signal of cylinder bank 2. Connect the wire parallel to the lambda sensor signal wire. |
| 40 | RPM        | purple-white | For measuring the engine speed. Connect to a Hall-sensor or camshaft sensor, Make sure that the squared signal is not higher then 30 Volt ! Never connect to the ignition coil (only with a RPM module) ! |

Injector measure wire ( injection module ) Bicolour / Full colour For measuring / interrupting the petrol injectors :

39
38
37
36
11
10
9
8

Interrupt each petrol injector control wire ( injector min )
Each VSI wire has a cylinder number printed on the wire, connect this wire to the corresponding petrol injector.

Connect the bicoloured VSI measuring wire to the ecu side, ( wire code: ECU SIDE ).

Connect the accompanying full coloured VSI wire to the petrol injector side ( wire code: MIN INJ SIDE ).


Attention:
Each bicoloured measuring wire corresponds to a specific LPG injector and cylinder number. Do not interchange the wires.

<table>
<thead>
<tr>
<th>Injection module</th>
<th>VSI-ecm</th>
<th>VSI injector rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-yellow</td>
<td>vsi nr. 39 (petrol injector cyl.1) =&gt; VSI-ecm=&gt; White-yellow vsi nr.33 (vsi injector cyl.1)</td>
<td></td>
</tr>
<tr>
<td>Green-yellow</td>
<td>vsi nr. 38 (petrol injector cyl.2) =&gt; VSI-ecm=&gt; Green-yellow vsi nr.32 (vsi injector cyl.2)</td>
<td></td>
</tr>
<tr>
<td>Pink-yellow</td>
<td>vsi nr. 37 (petrol injector cyl.3) =&gt; VSI-ecm=&gt; Pink-yellow vsi nr.31 (vsi injector cyl.3)</td>
<td></td>
</tr>
<tr>
<td>Blue-yellow</td>
<td>vsi nr. 36 (petrol injector cyl.4) =&gt; VSI-ecm=&gt; Blue-yellow vsi nr.30 (vsi injector cyl.4)</td>
<td></td>
</tr>
<tr>
<td>Grey-yellow</td>
<td>vsi nr. 11 (petrol injector cyl.5) =&gt; VSI-ecm=&gt; Grey-yellow vsi nr.05 (vsi injector cyl.5)</td>
<td></td>
</tr>
<tr>
<td>Bruin-yellow</td>
<td>vsi nr. 10 (petrol injector cyl.6) =&gt; VSI-ecm=&gt; Brown-yellow vsi nr.04 (vsi injector cyl.6)</td>
<td></td>
</tr>
<tr>
<td>Light blue-yellow</td>
<td>vsi nr. 09 (petrol injector cyl.7) =&gt; VSI-ecm=&gt; Light-blue-yellow vsi nr.03 (vsi injector cyl.7)</td>
<td></td>
</tr>
<tr>
<td>Red-yellow</td>
<td>vsi nr. 08 (petrol injector cyl.8) =&gt; VSI-ecm=&gt; Red-yellow vsi nr.02 (vsi injector cyl.8)</td>
<td></td>
</tr>
</tbody>
</table>
## Electrical connections VSI-2.0 wiring harness

Check and measure the wiring in case of changes in the cars wiring colours. Insulate all not used wires.

<table>
<thead>
<tr>
<th>Wire number / code</th>
<th>Wire colour</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>brown</td>
<td>Connect to the ‘-‘ of the battery; use a ring terminal for this purpose. Wire colour: Wire location:</td>
</tr>
<tr>
<td>32</td>
<td>brown</td>
<td>Connect to the ‘-‘ of the battery together with VSI wire 1 ground battery.</td>
</tr>
<tr>
<td>44</td>
<td>red</td>
<td>Connect to the ‘+‘ of the battery; use a ring terminal for this purpose or solder. Wire colour: Wire location: Do not place the fuse in the holder before having completed the installation of the LPG system.</td>
</tr>
<tr>
<td>13</td>
<td>red</td>
<td>Connect to the ‘+‘ of the battery together with VSI wire 44 +12V battery.</td>
</tr>
<tr>
<td>112</td>
<td>red-grey</td>
<td>Make a connection to + petrol injector or ignition+ ( +15 ) Wire colour: Wire location:</td>
</tr>
<tr>
<td>20</td>
<td>orange</td>
<td>For the measurement of the lambda signal of cylinder bank 1 Connect the wire in parallel to the lambda sensor. Wire colour: Wire location:</td>
</tr>
<tr>
<td>19</td>
<td>orange-white</td>
<td>For the measurement of the lambda signal of cylinder bank 2 Connect the wire in parallel to the lambda sensor. Wire colour: Wire location:</td>
</tr>
<tr>
<td>18</td>
<td>blue</td>
<td>For measuring the inlet manifold pressure ( MAP ). Wire colour: Wire location:</td>
</tr>
<tr>
<td>17</td>
<td>green</td>
<td>Optional connection. Wire colour: Wire location:</td>
</tr>
<tr>
<td>8</td>
<td>purple-white</td>
<td>For measuring the engine speed. Wire colour: Wire location:</td>
</tr>
</tbody>
</table>
**Electrical connections VSI-2.0 wiring harness**

Check and measure the wiring in case of changes in the cars wiring colours. Insulate all not used wires.

<table>
<thead>
<tr>
<th>3-pole connector</th>
<th>ND</th>
<th>For measuring the inlet manifold pressure (Prins MAP sensor). Connect the 3-pole connector to the Prins MAP sensor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>AD1 (MAP)</td>
<td>blue</td>
</tr>
<tr>
<td>27</td>
<td>+5 volt sensor</td>
<td>brown</td>
</tr>
<tr>
<td>37</td>
<td>C ground</td>
<td>red</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-pole blue connector</th>
<th>ND</th>
<th>For measuring the engine coolant temperature (Tect). Connect the connector to the reducer temperature sensor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Tect</td>
<td>grey</td>
</tr>
<tr>
<td>34</td>
<td>C ground</td>
<td>brown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4-pole connector</th>
<th>ND</th>
<th>For measuring gas pressure and temperature. Connect the connector to the filter unit sensor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>C ground</td>
<td>brown</td>
</tr>
<tr>
<td>14</td>
<td>T-Gas</td>
<td>grey</td>
</tr>
<tr>
<td>9</td>
<td>+5 Volt sensor</td>
<td>red</td>
</tr>
<tr>
<td>16</td>
<td>Psys</td>
<td>green</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-pole connector</th>
<th>ND</th>
<th>Connect the connector to the reducer lock-off valve.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>+12V reducer lock-off</td>
<td>yellow-green</td>
</tr>
<tr>
<td>31</td>
<td>Ground reducer lock-off</td>
<td>brown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4-pole connector</th>
<th>ND</th>
<th>Diagnose connector.</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>Service TxD</td>
<td>grey</td>
</tr>
<tr>
<td>65</td>
<td>Service RxD</td>
<td>grey</td>
</tr>
<tr>
<td>68</td>
<td>C ground</td>
<td>brown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3-pole connector</th>
<th>ND</th>
<th>Connect to the VSI switch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>+12V fuel switch</td>
<td>red</td>
</tr>
<tr>
<td>66</td>
<td>ground fuel switch</td>
<td>brown</td>
</tr>
<tr>
<td>49</td>
<td>LIN fuel switch</td>
<td>yellow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tank wiring loom</th>
<th>ND</th>
<th>Connect to the tank lock-off. Connect the tank level gauge. Connect to the tank lock-off.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Power tank valve 1</td>
<td>red</td>
</tr>
<tr>
<td>12</td>
<td>Tank level in</td>
<td>blue</td>
</tr>
<tr>
<td>26</td>
<td>ground tank lock off</td>
<td>black</td>
</tr>
</tbody>
</table>

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**Electrical connections VSI-2.0 wiring harness**

Check and measure the wiring in case of changes in the cars wiring colours.  
*Some wires/connectors are only available in the Full Spec VSI loom.*  
Insulate all not used wires.

<table>
<thead>
<tr>
<th></th>
<th>CAN 1 High</th>
<th>CAN 1 Low</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>blue-yellow</td>
<td>blue</td>
<td>Optional / insulate / Connect to EOBD diagnose connector Pin : 6</td>
</tr>
<tr>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>pink-yellow</td>
<td>pink</td>
<td>Optional / insulate / Connect to EOBD diagnose connector Pin : 14</td>
</tr>
<tr>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>CAN 2 High</th>
<th>CAN 2 Low</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>yellow</td>
<td></td>
<td>Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>5V ( EXT )</th>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>red</td>
<td></td>
<td>Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>+5V PU1 ( optional )</th>
<th>red</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td></td>
<td></td>
<td>Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>+5V PU2 ( optional )</th>
<th>red</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td></td>
<td></td>
<td>Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>+GAS injectors</th>
<th>red</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td></td>
<td></td>
<td>Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>K-line</th>
<th>pink</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td></td>
<td></td>
<td>Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>+12V (external)</th>
<th>red</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td></td>
<td></td>
<td>Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>power tank valve 2</th>
<th>red</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td>ground switched 1</td>
<td>brown</td>
<td>Connect to the second tank lock-off valve. Optional / insulate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>3-pole connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>+ manometer</td>
<td>red Connect to the CNG high pressure gauge Optional / insulate</td>
</tr>
<tr>
<td>12</td>
<td>tank level in</td>
<td>blue Optional / insulate</td>
</tr>
<tr>
<td>33</td>
<td>ground manometer</td>
<td>brown</td>
</tr>
</tbody>
</table>
For measuring the petrol injectors:

Interrupt each petrol injector control wire (injector min)
Each VSI wire has a petrol injector / cylinder number printed on the wire, connect this wire to the corresponding petrol injector / cylinder.

Connect the bicoloured VSI measuring wire to the **ecu side**, (wire code: ecu side inj).
Connect the corresponding full coloured VSI wire to the **petrol injector side** (wire code: min inj side).

**Attention:**
Each bicoloured measuring wire corresponds to a specific VSI injector and petrol injector / cylinder number. Do not interchange the wires.

### VSI measure wire nr.:

<table>
<thead>
<tr>
<th>VSI measure wire nr.</th>
<th>Full coloured / Bicoloured</th>
<th>To interrupt petrol injector wire colour / location</th>
</tr>
</thead>
<tbody>
<tr>
<td>121 ecu side injector 1</td>
<td>white-yellow white</td>
<td>Colour: Location:</td>
</tr>
<tr>
<td>120 injector side inj 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>119 ecu side injector 2</td>
<td>green-yellow green</td>
<td>Colour: Location:</td>
</tr>
<tr>
<td>118 injector side inj 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>117 ecu side injector 3</td>
<td>pink-yellow pink</td>
<td>Colour: Location:</td>
</tr>
<tr>
<td>116 injector side inj 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>115 ecu side injector 4</td>
<td>blue-yellow blue</td>
<td>Colour: Location:</td>
</tr>
<tr>
<td>114 injector side inj 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### VSI injector connectors:

<table>
<thead>
<tr>
<th>VSI injector connectors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>98 –GAS INJ 1</td>
<td>white-yellow red</td>
</tr>
<tr>
<td>106 +GAS INJ 1</td>
<td>Connector VSI-injector cylinder 1. (timing belt side)</td>
</tr>
<tr>
<td>99 –GAS INJ 2</td>
<td>green-yellow red</td>
</tr>
<tr>
<td>107 +GAS INJ 2</td>
<td>Connector VSI-injector cylinder 2.</td>
</tr>
<tr>
<td>100 –GAS INJ 3</td>
<td>pink-yellow red</td>
</tr>
<tr>
<td>108 +GAS INJ 3</td>
<td>Connector VSI-injector cylinder 3.</td>
</tr>
<tr>
<td>82 –GAS INJ 4</td>
<td>blue-yellow red</td>
</tr>
<tr>
<td>90 +GAS INJ 4</td>
<td>Connector VSI-injector cylinder 4.</td>
</tr>
</tbody>
</table>
Electrical connections RPM module 091/0236

- Connect the brown wire of the RPM module to the brown wire nr.50 of the VSI wiring loom.
- Connect the purple-white wire of the RPM module to the purple-white wire nr.40 of the VSI wiring loom.
- Connect the grey-white wire of the RPM module to the grey-white wire nr.13 of the VSI wiring loom.
- Connect the purple wire of the RPM module to the ignition coil driver wire.
Electrical connections Petrol Pressure Simulator 091/0252

Engines equipped with a return less fuel system. These engines can generate trouble codes and/or have difficulties with the fuel trims(mixture) on both petrol and lpg.

Brands: Mainly brands who are connected with Ford technologies like:
- Ford models from 2003/2004
- Jaguar models from 2003/2004
- Some Volvo models from 2003

Connections and Set-up
Connect the PPS module according the shown schematic. Measure the voltage, on petrol, for the blue wire (pressure sensor signal wire) when the engine is idling. Or read the actual petrol pressure when you have the disposal of a scan tool which can read the actual petrol system pressure.

Next we have to setup the same Voltage (pressure) when running on LPG via de pot meter. The pot meter is accessible when you remove the small protection cover of the module.
Electrical connections Dual Sensor Interface (DSI)

**DSI connection:**

Connect the interface wiring according to drawing, all blue and black wires are exchangeable since they are internally connected.

The DSI makes it possible to connect two level sensors to one LPG switch. The DSI will always show the highest LPG level on the switch.
Electrical connections CNG Prins Timing Optimizer (PTO)

Connect the PTO module according to the shown diagram.
Check if the latest software is downloaded in the PTO!
Prins Turbo / MAP sensor
Diagram 5 LPG Base layout VSI 4 cylinder connector
Diagram 6 LPG Base layout VSI 4 cylinder solder
Diagram 7 LPG Base layout VSI 5 cylinder
VSI base diagram 6 cylinder LPG (080/72055)

Diagram 8 LPG Base layout VSI 6 cylinder connector
Diagram 9 LPG Base layout VSI 6 cylinder solder
Diagram 10 LPG Base layout VSI 8 cylinder connector
Diagram 11 LPG Base layout VSI 8 cylinder solder
Diagram 13 VSI-2.0 LPG Base layout
Diagram 14 VSI-2.0 MAP LPG  Base layout
Diagram 13 Injection module 4-cylinder (180/70024 connector)
Diagram 14 Injection module 4-cylinder (180/70024 solder)
Make sure that the polarity of the petrol injectors and the VSI connectors are similar!
Diagram 16 Injection module 6-cylinder (180/70026 solder)
Make sure that the polarity of the petrol injectors and the VSI connectors are similar!
Diagram 19 Repair module 180/30024 (4-8 cylinder)
Diagram 20 connector injection module 091/71004

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connected to</th>
<th>Wire Color</th>
<th>Print on Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>VSI eau</td>
<td>white-yellow</td>
<td>39 eau side 1</td>
</tr>
<tr>
<td>A3</td>
<td>VSI eou</td>
<td>green-yellow</td>
<td>39 eau side 2</td>
</tr>
<tr>
<td>A4</td>
<td>VSI eou</td>
<td>pink-yellow</td>
<td>37 eau side 3</td>
</tr>
<tr>
<td>A5</td>
<td>VSI eou</td>
<td>blue-yellow</td>
<td>35 eau side 4</td>
</tr>
<tr>
<td>A6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A8</td>
<td>VSI eou</td>
<td>grey-white</td>
<td>13 ignition plus</td>
</tr>
<tr>
<td>B2</td>
<td>petrol eau</td>
<td>white-yellow</td>
<td>39 eau side 1</td>
</tr>
<tr>
<td>B3</td>
<td>petrol eau</td>
<td>green-yellow</td>
<td>38 eau side 2</td>
</tr>
<tr>
<td>B4</td>
<td>petrol eau</td>
<td>pink-yellow</td>
<td>37 eau side 3</td>
</tr>
<tr>
<td>B5</td>
<td>petrol eau</td>
<td>blue-yellow</td>
<td>36 eau side 4</td>
</tr>
<tr>
<td>B6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B8</td>
<td>VSI eou</td>
<td>red-white</td>
<td>28 inj. mod. command</td>
</tr>
<tr>
<td>C1</td>
<td>petrol injector</td>
<td>white</td>
<td>min inj side 1</td>
</tr>
<tr>
<td>C2</td>
<td>petrol injector</td>
<td>white</td>
<td>min inj side 2</td>
</tr>
<tr>
<td>C3</td>
<td>petrol injector</td>
<td>green</td>
<td>min inj side 3</td>
</tr>
<tr>
<td>C4</td>
<td>petrol injector</td>
<td>blue</td>
<td>min inj side 4</td>
</tr>
<tr>
<td>C5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8</td>
<td>VSI eau</td>
<td>brown</td>
<td>54 inj. mod. ground</td>
</tr>
</tbody>
</table>

Material: | Unit: mm |
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Diagram 21 injection module 091/71006
Diagram 22 Replacing the injection module 180/70024 → 091/0145
Diagram 23 Replacing the injection module 180/70024 → 091/71004 (4 cylinder)
Diagram 24 Replacing the injection module 180/70026 → 091/71006 (6 cylinder)
Diagram 25 Replacing the injection module 180/70024 → 091/71004 (8 cylinder)
Diagram 26 LPG wiring 180/70014
Diagram 28 LPG wiring 180/70016
Diagram 29 LPG wiring 180/70006
Diagram 32 LPG wiring 080/72040
Diagram 35 LPG wiring 080/72055
Diagram 39 VSI-2.0 wiring 191/040002
<table>
<thead>
<tr>
<th>Trouble code</th>
<th>Definition</th>
<th>Check / solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Lambda to long to rich.</td>
<td>Check when operating on petrol and LPG that there is good lambda signal movement.</td>
</tr>
<tr>
<td>101</td>
<td>Lambda to long to lean.</td>
<td>Check when operating on petrol and LPG that there is good lambda signal movement.</td>
</tr>
<tr>
<td>102</td>
<td>Lambda to long to lean during open loop.</td>
<td>Check when operating on petrol and LPG that there is good lambda signal movement.</td>
</tr>
<tr>
<td>110</td>
<td>T-ECT &gt;= 171°C</td>
<td>Check if the ECT sensor (blue) in the reducer is connected to ground.</td>
</tr>
<tr>
<td>111</td>
<td>T-ECT &lt;= -40°C</td>
<td>Check if the ECT sensor (blue) in the reducer has a power connection.</td>
</tr>
<tr>
<td>120</td>
<td>T-LPG &gt;= 171°C</td>
<td>Check the ground connection of the Pressure/temperature sensor in the filter unit.</td>
</tr>
<tr>
<td>121</td>
<td>T-LPG &lt;= -40°C</td>
<td>Check the power connection of the Pressure/temperature sensor in the filter unit.</td>
</tr>
<tr>
<td>150</td>
<td>Psys &lt;= Low_Level</td>
<td>Based on a pressure drop in the system, this can be caused by an empty LPG tank, incorrect solenoid valve, polluted filter or incorrectly adjusted pressure.</td>
</tr>
<tr>
<td>160</td>
<td>ECM-VSI not activated</td>
<td>Activate the LPG computer with the diagnostic program, using the F11 function key.</td>
</tr>
<tr>
<td>180</td>
<td>T-Board &gt;= 90°C</td>
<td>Replace the VSI computer in a cooler area.</td>
</tr>
<tr>
<td>181</td>
<td>Battery voltage to high</td>
<td>Check battery voltage / alternator output and condition of the battery.</td>
</tr>
<tr>
<td>210-220-230-240-250-260-270-280</td>
<td>VSI injector overload</td>
<td>Injector current to high, check for short circuiting</td>
</tr>
<tr>
<td>310</td>
<td>Adjusted pressure on idle out of range</td>
<td>Adjust the idle pressure to the value shown by parameter &quot; Idle Level &quot;.</td>
</tr>
<tr>
<td>311</td>
<td>Programm error during flashing the memory</td>
<td>Check parameter settings, contact Prins Autogassystemen.</td>
</tr>
<tr>
<td>320</td>
<td>Psys voltage to low</td>
<td>Check the ground connection of the Pressure/temperature sensor in the filter unit.</td>
</tr>
<tr>
<td>321</td>
<td>Psys voltage to high</td>
<td>Check the power connection of the Pressure/temperature sensor in the filter unit.</td>
</tr>
<tr>
<td>322</td>
<td>Psys &gt; 3.5 Bar</td>
<td>Check the coolant temperature (T-ect) and the evaporator for leakage of the first stage.</td>
</tr>
<tr>
<td>330</td>
<td>unexpected parameter change</td>
<td>Contact Prins Autogassystemen.</td>
</tr>
<tr>
<td>340</td>
<td>reducer warms up to slow</td>
<td>Check the water connections / circuit.</td>
</tr>
<tr>
<td>341</td>
<td>Gas leakage, system pressure is less then 1.25 bar after 4 hours when the engine is not running</td>
<td>Check the system for gas leakage.</td>
</tr>
<tr>
<td>div.</td>
<td>System switches to LPG but engine stalls immediately.</td>
<td>LPG tank empty? Lock-off valves open?</td>
</tr>
<tr>
<td>div.</td>
<td>No injection timing on LPG ( 0 Msec.)</td>
<td>Check the injection module.</td>
</tr>
<tr>
<td>div.</td>
<td>The LPG system switches constantly between LPG and Petrol</td>
<td>Check coolant system for air. T-ect sensor in the evaporator malfunction.</td>
</tr>
<tr>
<td>div.</td>
<td>Engine hesitates on high revs, and not running on all cylinders. Engine runs good on idle.</td>
<td>Check for kinked or jammed LPG hoses (between VSI injector and couplings). Check for blocked inlet couplings.</td>
</tr>
<tr>
<td>div.</td>
<td>Switch LED’s don’t lit up</td>
<td>Check the main fuse of the VSI system Check ignition+ (VSI wire 13)</td>
</tr>
<tr>
<td>div.</td>
<td>Fault codes when turning the ignition off ( key out the ignition )</td>
<td>Caused by different switch off times between ignition+ and injector power. Connect VSI wire 13 to the petrol injector feed instead of ignition+.</td>
</tr>
<tr>
<td>div.</td>
<td>The orange LED on the switch flashes</td>
<td>Activate the LPG computer with the diagnostic program, using the F11 function key.</td>
</tr>
<tr>
<td>div.</td>
<td>The LPG system switches to LPG but engine stalls immediately</td>
<td>LPG tank empty?</td>
</tr>
<tr>
<td>div.</td>
<td>Not running on all cylinders on lpg</td>
<td>Check parameter 10, number of cylinders.</td>
</tr>
<tr>
<td>div.</td>
<td>No injection times on lpg</td>
<td>Check the connections of the injection module.</td>
</tr>
<tr>
<td>div.</td>
<td>Injection time “falls” to 0 mSec on LPG</td>
<td>Check the injection module.</td>
</tr>
<tr>
<td>div.</td>
<td>Check engine while running on LPG, injector circuit malfunction, no lambda control (limb home)</td>
<td>Replace injection module</td>
</tr>
<tr>
<td>div.</td>
<td>Not starting / running on petrol</td>
<td>Check the connections of the injection module.</td>
</tr>
</tbody>
</table>
When you drive on LPG/CNG, maintaining your car is even more important than when using petrol. Since the specifications of LPG/CNG differ from those of petrol, minor engine problems which won't disturb the driving comfort while using petrol, may cause major problems while using CNG. Follow the maintenance instructions in order to use LPG/CNG without any problem.

- General maintenance to the car regarding spark plugs, spark plug cables, ignition circuit, valves, etc., has to be carried out according to the instructions of the car manufacturer.
- Proof of maintenance according to the guidelines of the importer is obligatory (completely filled in maintenance booklet).
- Maintenance has to be carried out by a dealer authorised by the importer.
- Adjustments and repairs on your Prins VSI- system should only be carried out by a dealer authorised by Prins Autogassystemen B.V.

### MAINTENANCE AND SERVICE

#### Registration of maintenance and service of the VSI-LPG system.

<table>
<thead>
<tr>
<th>Checklist executed services</th>
<th>25,000 km or after 2 years</th>
<th>100,000 km or after 2 years</th>
<th>175,000 km or after 2 years</th>
<th>250,000 km or after 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lock off valve filter replacement*</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Filter unit filter replacement*</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Hoses + filling hoses checked</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Fastening of components checked</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Electrical connection + wiring checked</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Checked for fuel leakage</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Checked for trouble codes (petrol and LPG) + system pressure</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Checked for exhaust emissions</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Tightening torque of the allen screws of the reducer checked at 8Nm</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
</tbody>
</table>

Number of kilometres:  
Date:  
Dealer stamp

*The service intervals of the filter replacements may be divergent because of the variable LPG quality. Ask your Prins dealer for more information.*
## Registration of maintenance and service of the VSI-CNG system.

<table>
<thead>
<tr>
<th>Checklist executed services:</th>
<th>25.000 km or after 2 years</th>
<th>100.000 km or after 2 years</th>
<th>175.000 km or after 2 years</th>
<th>250.000 km or after 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keihin inlet filter replacement*</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
<tr>
<td>Filter unit filter replacement*</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
<tr>
<td>Hoses + pipes checked</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
<tr>
<td>Fastening of components checked</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
<tr>
<td>Electrical connection + wiring checked</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
<tr>
<td>Checked for fuel leakage</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
<tr>
<td>Checked for trouble codes (petrol and CNG) + system pressure</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
<tr>
<td>Checked for exhaust emissions</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
<td>![Dealer stamp](Dealer stamp)</td>
</tr>
</tbody>
</table>

*The service intervals of the filter replacements may be divergent because of the variable CNG quality. Ask your Prins dealer for more information.

**Number of kilometres:**

- 25.000 km: [ ]
- 100.000 km: [ ]
- 175.000 km: [ ]
- 250.000 km: [ ]

**Date:**

- 25.000 km: [ ]
- 100.000 km: [ ]
- 175.000 km: [ ]
- 250.000 km: [ ]
Checklist after installation

1. Connect the serial interface cable and run the VSI diagnosis program.
   Install the VSI main fuse, and program the fuel switch.
   Turn the ignition key in the accessory position.
   When working on the car, beware of moving and rotating parts in the engine compartment.

2. When commissioning the LPG/CNG system, you must activate the VSI computer with the diagnosis software. When the VSI-I computer has not been activated, it will keep generating error code 160. To activate the VSI-I computer, select function F11 (activate ECM). After activation erase faultcode 160.

3. Check whether the program in the VSI computer matches with the car (dedicated engine set):
   Refer with F2 to the box number and car description in the diagnosis software and compare these with the set number.

4. The system will switch over to LPG/CNG as soon as the temperature of the coolant (T-ect) becomes higher than the parameter T-min set and when the TSO-cold time is expired.

5. Check all components and connections for any gas leakage (use a LPG/CNG leak detector device) or foam leak spray. Caution for moving and rotating parts in the engine compartment!

6. Let the engine run warm on petrol >80°C.
   Check if the evaporator/coolant water heats up.
   Check the engine signals: petrol injection time, RPM, ECT, lambda
   Let the engine run idle on LPG/CNG.
   Adjust the LPG evaporator pressure. Refer to the parameter list (or F2 : ID box) for the idle level value set.
   Adjust the LPG evaporator pressure in such a way that the pressure measured (P-sys) equals the idle level value.
   Turn the socket-head screw at the front of the evaporator to adjust the pressure.
   An error code will be generated whenever the pressure variation is too high.
   Seal the evaporator with the sticker included in the delivery after having adjusted the pressure.

7. Use the diagnosis software to check again all input and output signals.

8. Check the system for error codes and solve these, if required.
   Check the petrol MMS for EOBD error codes.
   Place the protection connector on the VSI communication connector.

9. Make a test drive and check the driveability on LPG/CNG and petrol.