ALTERNATIVE FUEL SYSTEMS

Prins

Quality, innovation and customer care, it's in our nature

Installation manual

Universal

MANUFACTURER	….
TYPE	….
ENGINE DISPLACEMENT	cc
NUMBER OF VALVES	….
ENGINE CODE / NUMBER - OUTPUT	**** - ** kW
FIRING ORDER	1-3-4-2
VEHICLE CATEGORIES	M
TRANSMISSION	….
VERSION	AFC-**Compact**
TYPE VSI INJECTOR	cc
PETROL ECU MANUFACTURER / CODE	….
MODEL YEAR:	….
MANUAL NUMBER	….
DATE	….

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Version 10-7-2024

VSI-2.0 LPG

TABLE OF CONTENTS

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General instructions

- The installation of the system shall be done in accordance with the installation manual provided by Prins Autogassystemen.
- This manual is based on Dutch regulations, always install the system in accordance to the local regulations.
- Always download the “general manual 1/2 “ from our website for basic instructions and diagrams.
- Always disconnect the battery when installing the LPG system. Make sure the ignition key is outside the car. Be aware of central door locking, radio / telephone memory code, alarm system.
- Do not place the main fuse into the fuse holder before having completed the installation of the VSI-2.0 system.
- The VSI computer (AFC) 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 harness is not model specific, therefore is 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-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 pipe. (This guarantees the maximum flow through the pipe without pollution.)
- If holes have to be drilled (wear safety glasses) for installing brackets, etc., the drilled holes must always be treated with an anti-corrosion agent, after the chips have been removed (especially when mounting a exterior filler into body work).
- After having completed the installation, check the whole system for gas leakage; use a gas leak detection device. Also check for leak of engine coolant, petrol and air.
- Fitting and maintenance is only allowed by Prins Autogassystemen selected LPG engineers.
- Failure to follow the instructions in this manual can result in a poor or non-working gas installation or a dangerous situation.
- For maintenance instructions and filter registration see owner manual.
- 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 diagrams, certificates, updates, info-bulletins and product information.

Please fill in the warranty portal completely within 14 days after installation.
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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
- Vehicle fuel system scan tool or OBD scan tool Prins (part nr. 099/99928)
- Exhaust gas analyser
- Multimeter
- Oscilloscope
- Prins diagnostic software
- Prins diagnostic tool
- Torque wrench (5-50Nm)
- Torque wrench (200-250Nm)
- Portable light
- Assortment drill bits 4 to 12 mm
- Assortment cutters (ø 20, 30, 50, 70 mm)
- Portable drill or pneumatic drill
- Thread cutting device (male M6x1, M8x1, M10x1)
- Air gun
- Vacuum cleaner
- Safety goggles
- Hot air gun
- 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

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 analyser)
- Check the condition of the ignition system (spark plugs, cables, coil)

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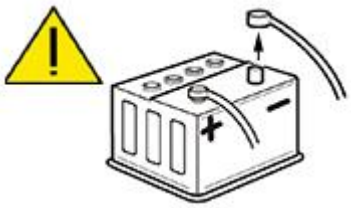
Tightening moments

	Nm	Spanner mm
M4 x 0,7	3.3	7
M5 x 0,8	6.5	8
M6 x 1,0	11.3	10
M7 x 1,0	14.5	11
M8 x 1	24.5	13
M8 x 1,25	27.3	13
M10 x 1	52	15-16-17
M10 x 1,5	54	15-16-17

EXPLANATION OF SYMBOLS :

= IMPORTANT, CAUTION



= WEAR SAFETY GOGGLES

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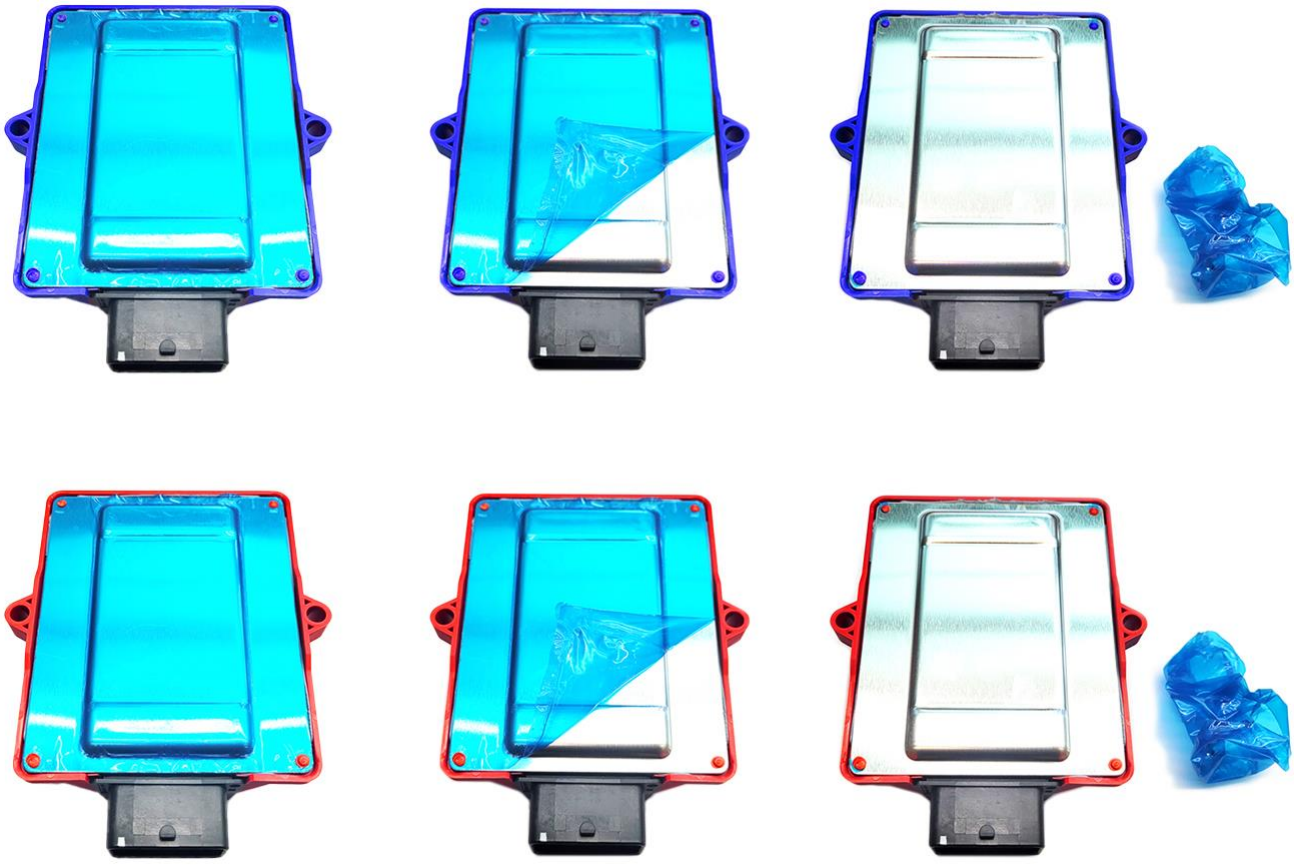
Remove foil before use



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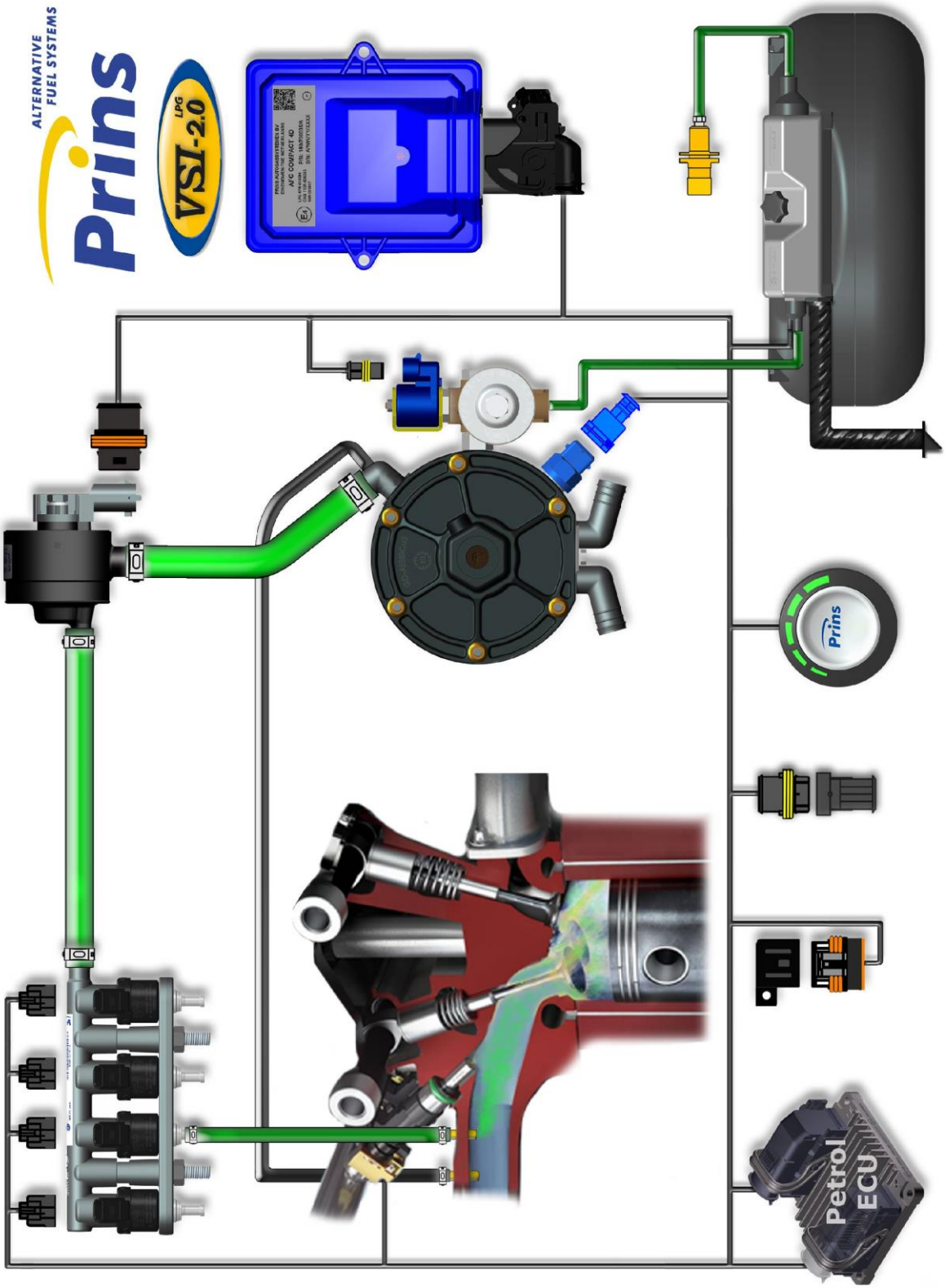
Base diagram



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VSI approval numbers

Reducer VSI LPG Prins : E4-67R-010054
Lock-off valve OMB : E8-67R-014327
Lock-off valve Valtek : E4-67R-010041

Injector rail Prins : LPG E4-67R-010093
CNG E4-110R-000021

Filter unit T1 / T2 Prins : LPG E4-67R-010096
CNG E4-110R-000028

Injector Keihin KN9 : LPG E4-67R-010310
CNG E4-110R-000295

Prins AFC : E4-67R-010098
E4-10R-030507

Tubithor : LPG E13-67R-010145
CNG E13-110R-000017
Rubia : LPG E4-67R-010068
CNG E4-110R-000003
WinLas : LPG E37-67R-010140
CNG E37-110R-000012

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Reducer Overpressure / MAP connection

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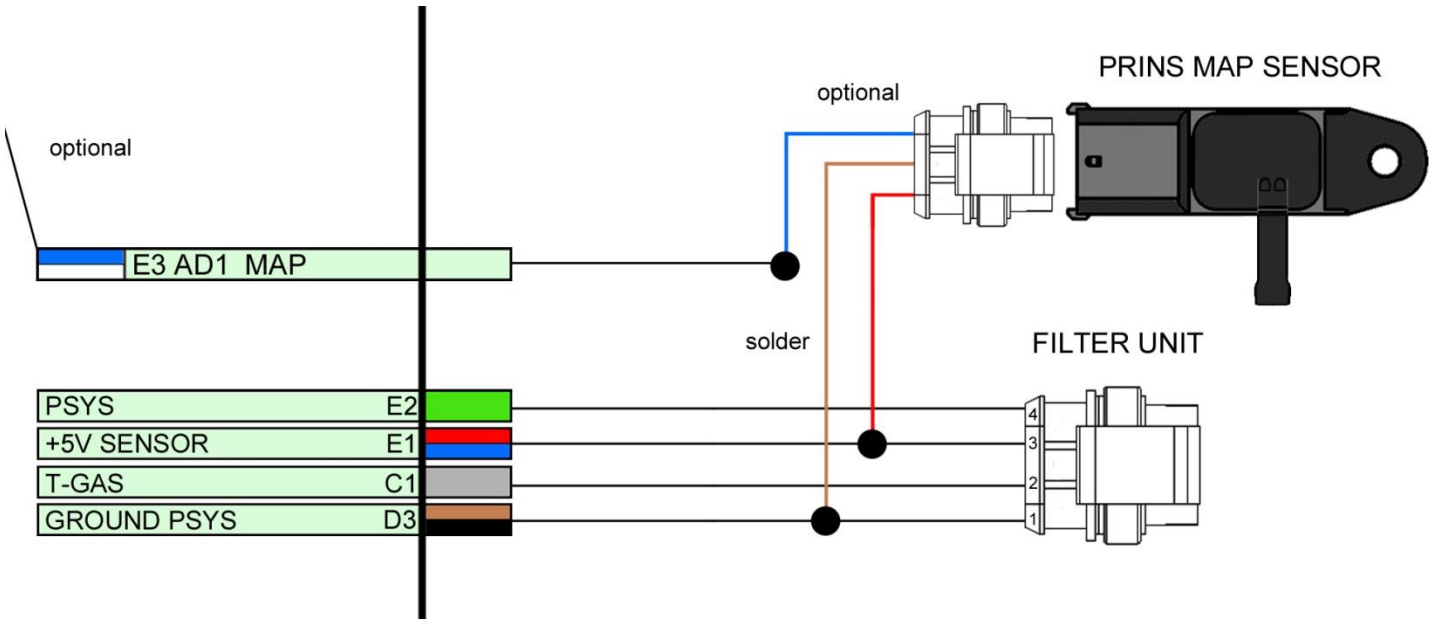
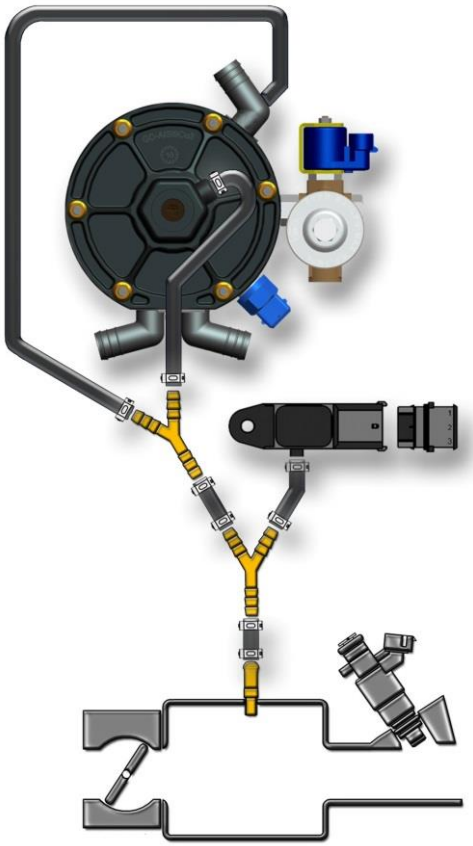
Prins Turbo / MAP sensor connection





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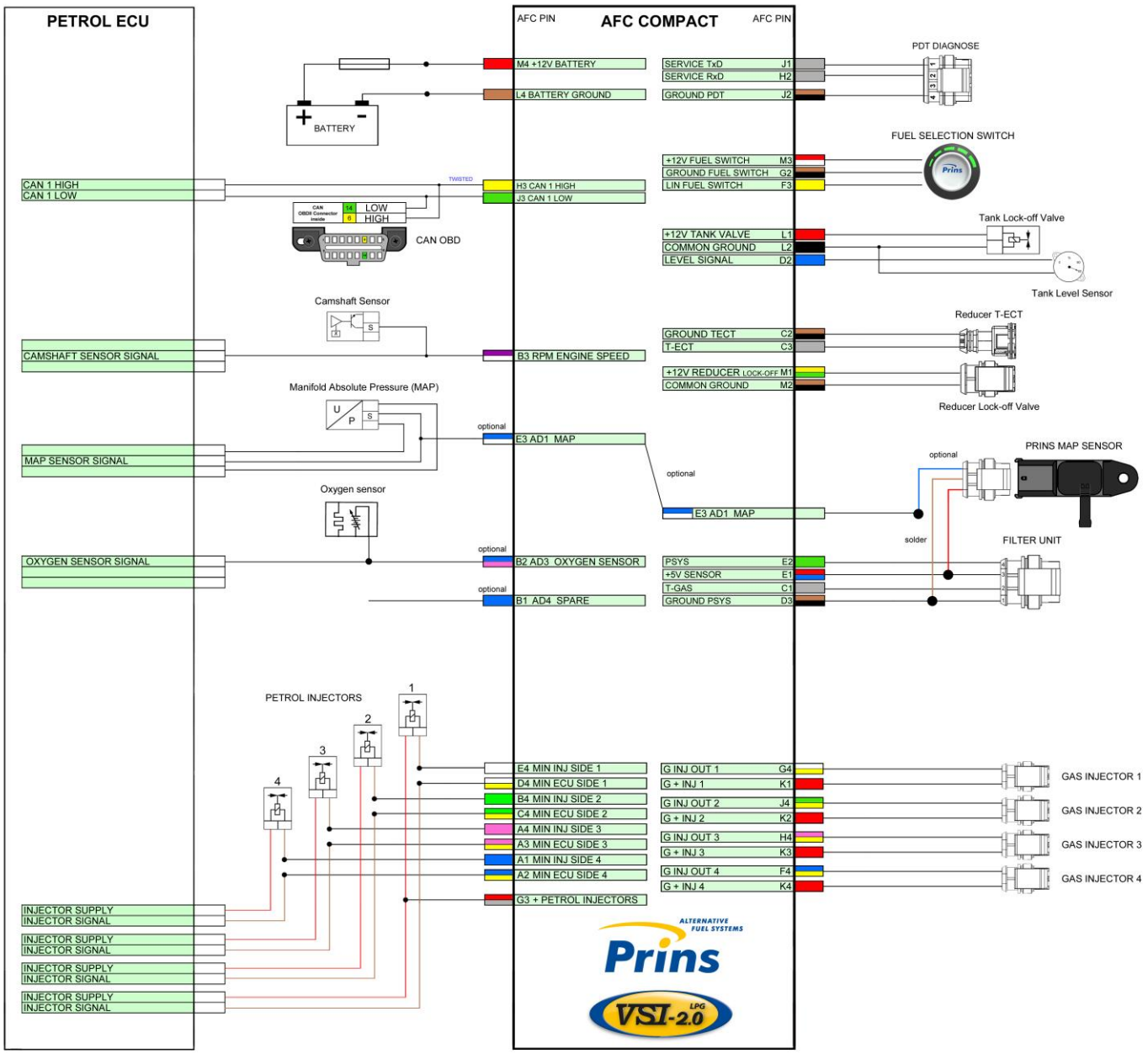
Wiring diagram AFC Compact



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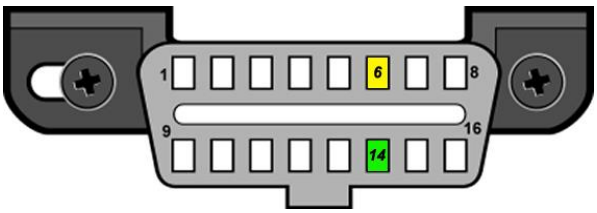
Electrical connections

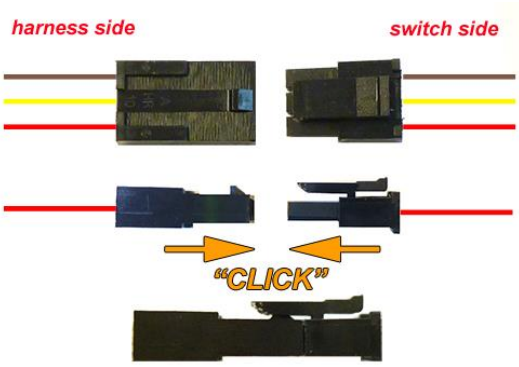
Check and measure the wiring in case of changes in the cars wiring colours.

Driver room

				Connect to EOBD diagnose connector.
H3	CAN1 High		Yellow	Pin : 6
J3	CAN1 Low		Green	Pin : 14



3-pole micro connector				*Connect the 3-pole connector to the Prins fuel selection switch.*
G2	Ground fuel switch		Brown-black	
M3	+12V fuel switch		Red-white	
F3	LIN fuel switch		Yellow	



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Electrical connections

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

⚠ 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.**
Connect the **corresponding full coloured** VSI wire to the **petrol injector side**.
See diagrams: Installation manual general part 1 / 2.

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

Petrol injector **cyl. 1**			
E4 MIN INJ SIDE 1		White	Injector side
D4 MIN ECU SIDE 1		White-yellow	ECU side
			Colour : Location :

Petrol injector **cyl. 2**			
B4 MIN INJ SIDE 2		Green	Injector side
C4 MIN ECU SIDE 2		Green-yellow	ECU side
			Colour : Location :

Petrol injector **cyl. 3**			
A4 MIN INJ SIDE 3		Pink	Injector side
A3 MIN ECU SIDE 3		Pink-yellow	ECU side
			Colour : Location :

Petrol injector **cyl. 4**			
A1 MIN INJ SIDE 4		Blue	Injector side
A2 MIN ECU SIDE 4		Blue-yellow	ECU side
			Colour : Location :

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Electrical connections

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

Wire number / code	Wire colour	Connection

+BAT				*Connect to the '+' of the battery; use a ring terminal or solder. Do not place the fuse in the holder before having completed the installation of the LPG system.* Wire colour : Wire location :
M4	+12V Battery		Red	

- BAT				*Connect to the '-' of the battery; use a ring terminal or solder.* Wire colour : Wire location :
L4	Battery Ground		Brown	

+PETROL INJECTORS				*Make a connection to ignition + / contact +/ petrol injector +* Wire colour : Wire location :
G3	+Petrol Injectors		Red-grey	

RPM				*For measuring the engine speed signal.* Wire colour : Wire location :
B3	RPM engine speed		Purple-white	

AD1 MAP				*For measuring the MAP signal.* Wire colour : Wire location :
E3	AD1 MAP		Blue-white	

AD3 OXYGEN SENSOR				*For measuring the upstream oxygen sensor signal.* Wire colour : Wire location :
B2	AD3		Blue-pink	

AD4 SPARE		*optional*		*Connect to the …….* Wire colour : Wire location :
B1	AD4 Spare		Blue	

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Connector connections

Connectors VSI injector rail

G4	G INJ OUT 1	White-yellow	VSI injector cyl. 1
K1	G+ INJ 1	Red	
J4	G INJ OUT 2	Green-yellow	VSI injector cyl. 2
K2	G+ INJ 2	Red	
H4	G INJ OUT 3	Pink-yellow	VSI injector cyl. 3
K3	G+ INJ 3	Red	
F4	G INJ OUT 4	Blue-yellow	VSI injector cyl. 4
K4	G+ INJ 4	Red	

Connectors in wiring loom

C3	T-ECT	Grey	For measuring the engine coolant temperature (Tect). Connect the connector to the reducer temperature sensor.
C2	GROUND T-ECT	Brown-black	
M1	+12V REDUCER	Yellow-green	Connect the connector to the reducer lock-off valve.
M2	COMMON GROUND	Brown-black	
E2	PSYS	Green	For measuring gas pressure and temperature. Connect the connector to the filter unit sensor.
E1	+5V SENSOR	Red-blue	
C1	T-GAS	Grey	
D3	GROUND PSYS	Brown-black	
J1	SERVICE TxD	Grey	Diagnose connector / PDT.
H2	SERVICE RxD	Grey	
J2	GROUND PDT	Brown-black	
L1	+12V TANK VALVE	Red	Connect to the tank lock-off valve. Connect to the tank lock-off valve / tank level gauge. Connect the tank level gauge.
L2	COMMON GROUND	Black	
D2	LEVEL SIGNAL	Blue	

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Checklist after installation

Caution for moving and rotating engine parts!

1. Make sure the installation is done according to the installation manual.

2. Install the system fuse.
   Connect the Prins Diagnostic Tool (serial interface cable) and run the Prins AFC Software.

3. Before commissioning the LPG system, it is necessary to activate the AFC (Prins ECU) using the Prins AFC Software.
   To activate the AFC, press the activation button in the Prins AFC Software.

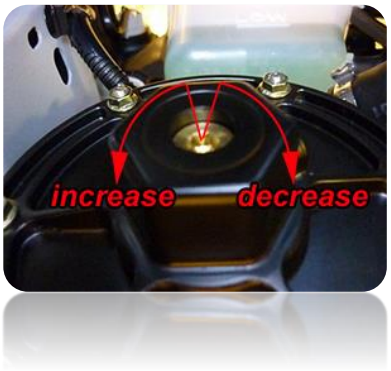
4. For dedicated applications, check whether the correct calibration is programmed in the AFC and matches with the car details. Refer the car details, go to; “Info”>>”Calibration” in the Prins AFC Software.

5. Start the engine and let it run in petrol mode.
   Check all coolant water connections for leakage and refill the coolant reservoir.
   Go to “Diagnostic”>>”monitor” in the Prins AFC software and check the connected incoming signals:
   - Engine Coolant Temp. (monitor if the reducer heats up >80 C) [par.70]
   - Petrol Inj. Time cyl.1-4
   - Engine RPM [par.101]
   - Gas Absolute Pressure [par.73]
   - Manifold Absolute Pressure (if connected) [par.76]
   - Manifold Air Flow (if connected) [par.1083.]
   - Lambda signal(s) (if connected) [par.1716,1717]
   - Valve Care communication Status (if connected) [par.4823]

6. Switch over to gas mode (Engine may stall the first time because of empty lines).
   Check all components and connections for any gas leakage; use a LPG leak detector device, detection fluid.
   Check tank level indication.

7. Check / Adjust the reducer pressure (make sure the engine is at working temperature); go to “Diagnostic”>>”Service” in the Prins AFC software and adjust the reducer pressure so that the current pressure is equal to the target pressure.

   Turn the Allen screw at the front of the reducer to adjust the pressure.



8. Check for system error codes; go to “Diagnostics”>>”Trouble codes”
   Check for OBD error codes by using an OBD tester.
   Place the protection connector on the VSI communication connector.

9. Check the drivability of the car, both on gas and petrol.

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