Installation manual
PART 2/2

MANUFACTURER	VAG
TYPE	(based on Audi A6)
ENGINE DISPLACEMENT	2800cc - CCDA / CCEA // 3200cc - AUK
NUMBER OF VALVES	24
ENGINE CODE / NUMBER - OUTPUT	AUK – 188kW / CCDA – 140kW / CCEA – 162kW
FIRING ORDER	1-4-3-6-2-5
VEHICLE CATEGORIES	M
TRANSMISSION	MT / AT
VERSION	AFC-2.1 DI
TYPE VSI INJECTOR	KN9 - 73cc
TYPE INJECTION MODULE	Gen2 Type 2
PETROL ECU MANUFACTURER / CODE	SIEMENS VDO SIMOS 6.2A / SIMOS 8.10
MODEL YEAR:	2007-2011
SYSTEM APPROVAL NUMBER (R115)	E4-#115R-000020 / VSI-LPG 31
LOCATION R115 SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	366/120047/A
MANUAL NUMBER	076/2616300-1
DATE	2020-07-16

Revision: 1

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FOR EXPLANATION AND CIRCUIT DIAGRAMS SEE : INSTALLATION MANUAL GENERAL PART 1 / 2

Manual updates / revision

Rev. nr	Rev. Date	Subject update
-	2016-04-18	-
1	2020-07-16	Added CCDA & CCEA engine code with Simos 8.10 ECU

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 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 harness is not model specific, therefore it may be necessary to adjust the length of the wires. Ensure maximum care is taken when connecting the 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 an 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 any 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 LPG-installation or a dangerous situation.
- For maintenance instructions and filter registration see owner’s 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.

Required equipment / tools / materials for installing a complete system

- Complete workshop toolbox (wrenches, screwdrivers, cutters, pliers, ratchet, sockets)
- Car lift
- Portable computer
- 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 (Ø20, 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

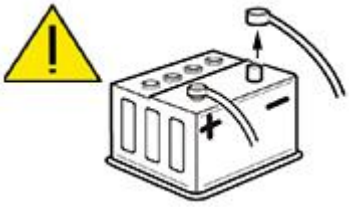
- Check the vehicle drivability on petrol
- Check the fuel system for error codes (scan tool)
- Check if the catalytic converter is in good condition (exhaust gas analyser)
- Check the condition of the ignition system (spark plugs, cables, coil)

Tightening moments

	Nm	Spanner mm
M 4 x 0,7	3.3	7
M 5 x 0,8	6.5	8
M 6 x 1,0	11.3	10
M 7 x 1,0	14.5	11
M 8 x 1	24.5	13
M 8 x 1,25	27.3	13
M 10 x 1	52	15-16-17
M 10 x 1,5	54	15-16-17

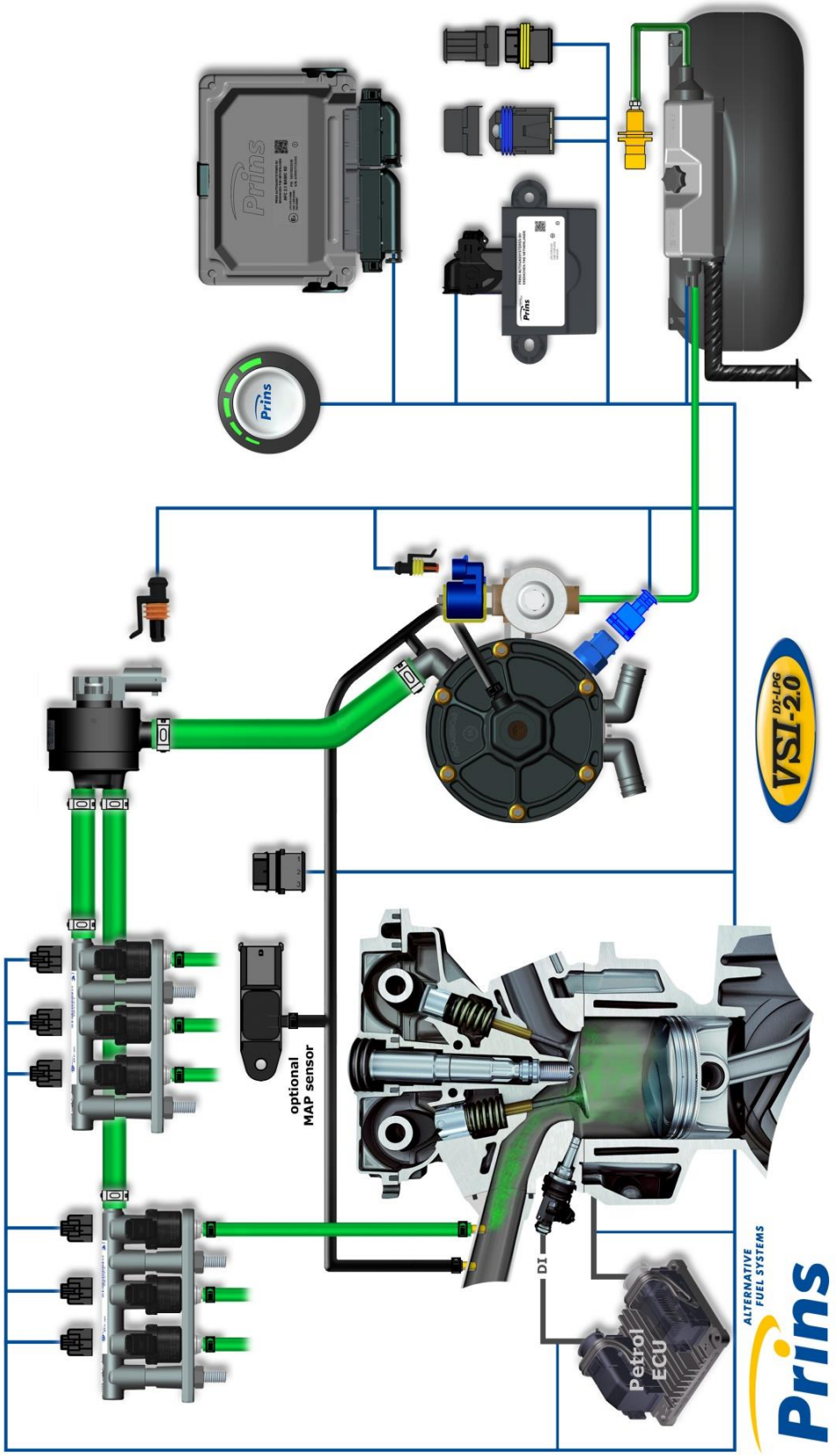
EXPLANATION OF SYMBOLS :

= IMPORTANT, CAUTION



= WEAR SAFETY GOGGLES

Base diagram



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
Filter unit Keihin: LPG E4-67R-010177
CNG E4-110R-000091

Injector Keihin KN8 : LPG E4-67R-010092
CNG E4-110R-000020
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
Thunderflex LPG E24-67R-010018
CNG E24-110R-000040

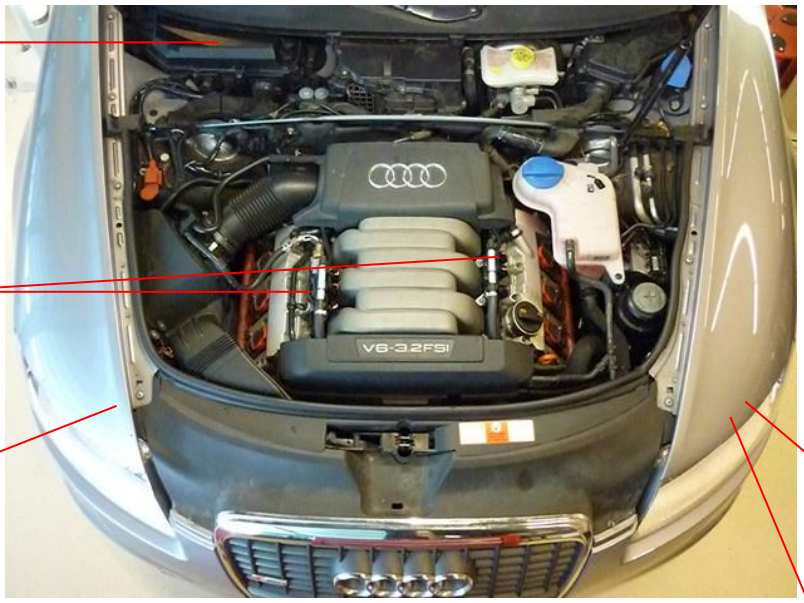
VSI component location overview

(example Audi A6 AUK)

Petrol ECU

Rail(s)

AFC & Injection module



Reducer

Filter

Mounting the reducer
(example Audi A6 AUK)

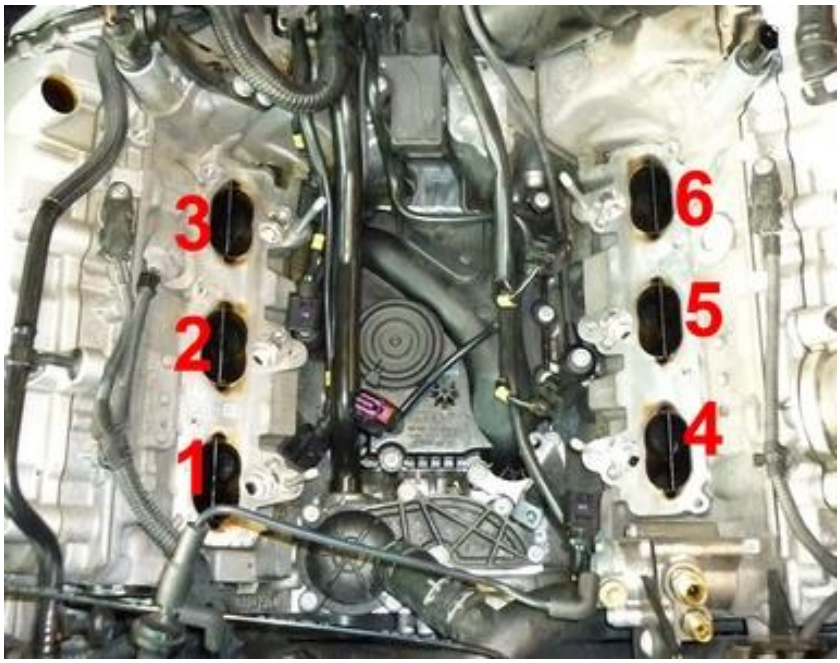
Water connections

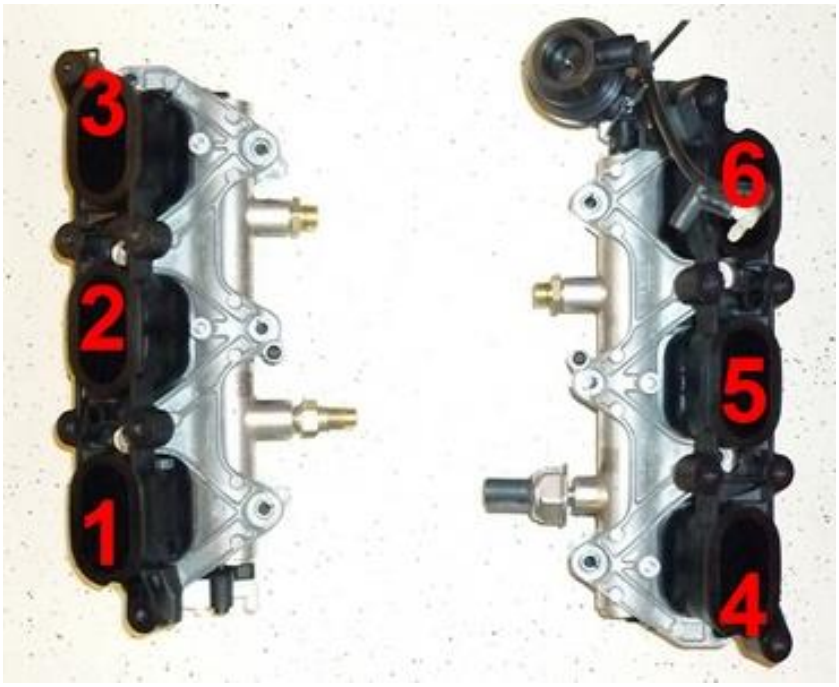
Connect the water hoses serial with the oil cooler hose.

Overpressure / MAP connection

Mounting the inlet manifold couplings

Remove top manifold. **Carefully remove the high pressure petrol lines!** Remove the inlet manifolds.
Drill **6** holes of **5**mm in the inlet manifold, cut **M6** thread in these holes.
Place the VSI couplings with a lock compound in the inlet manifold.
Watch out that the lock compound doesn't come inside the VSI couplings
and place the inlet manifold with lpg hoses back on the engine.
BEWARE OF the tumble flaps.. Install inlet with flaps in open position !!

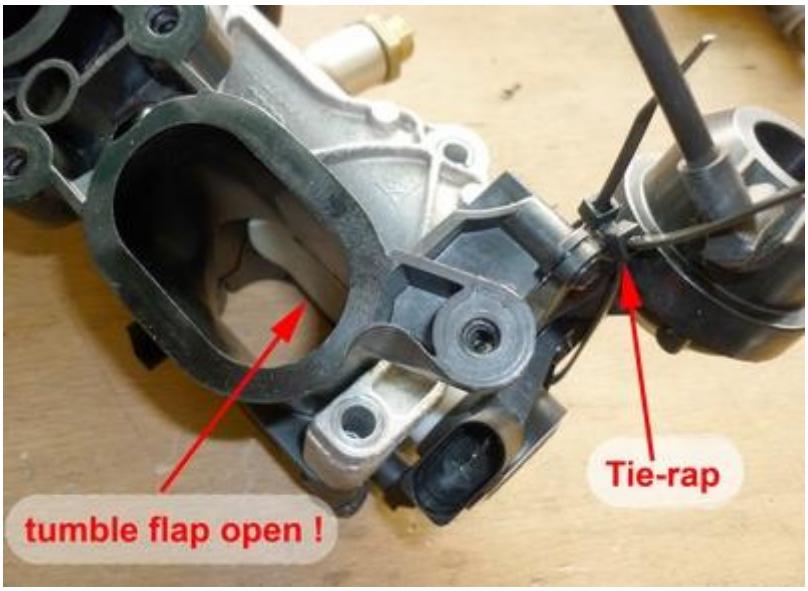




B1 **B2**

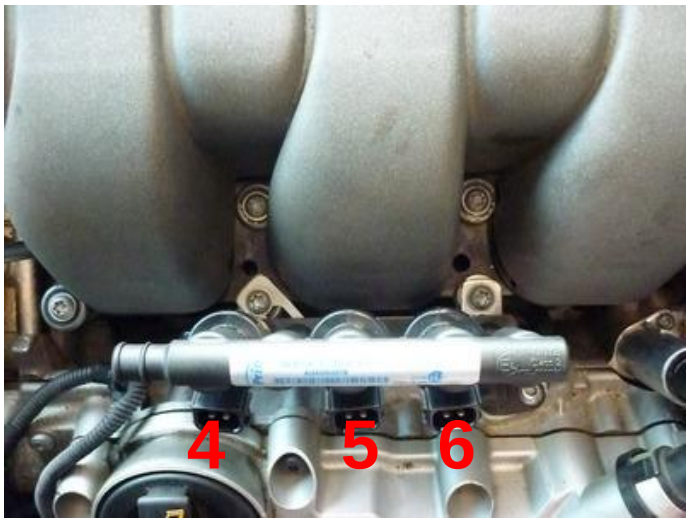
Mounting the inlet manifold

Use a tie-rap to lock the tumble flap vacuum valve in open position.
Install the inlets and remove the tie-rap.
Flaps will close against tumble flap plate.



Mounting the VSI injector rail bank 1

Mounting the VSI injector rail bank 2



Mounting the Prins filter unit

Mount the filter directly onto the reducer outlet wit 6 cm LPG hose (Ø16mm)

Mounting the Keihin filter unit

Mount the filter onto reducer bracket (2x M6x10bolt)

Filter replacement must be recorded in the service book supplied

LPG hoses

(example Audi A6 AUK)

Hose (Ø..mm)	*From component*	*To component*	*Hose length (cm)*
16	Reducer	Prins filter unit	6
16	Reducer	Keihin filter unit	32
11	Prins filter unit	VSI injector rail B1	145
11	Prins filter unit	VSI injector rail B2	100
11	Keihin filter unit	VSI injector rail B1	145
11	Keihin filter unit	VSI injector rail B2	100
5	Reducer overpressure	Y-piece	10
5	Reducer MAP connection	Y-piece	25
5	Y-piece	Inlet manifold coupling (vacuum)	100
5	VSI injector 1	Inlet manifold coupling cyl.1	11
5	VSI injector 2	Inlet manifold coupling cyl.2	17
5	VSI injector 3	Inlet manifold coupling cyl.3	12,5
5	VSI injector 4	Inlet manifold coupling cyl.4	8,5
5	VSI injector 5	Inlet manifold coupling cyl.5	11
5	VSI injector 6	Inlet manifold coupling cyl.6	18

General info.
In Case of a *Keihin* filter : only use two **M6x10mm** bolts with spring washers.

Cut the LPG hoses on length.
Cut the nylon hoses on length, make sure that the inlet of the nylon hose faces the injector outlet.

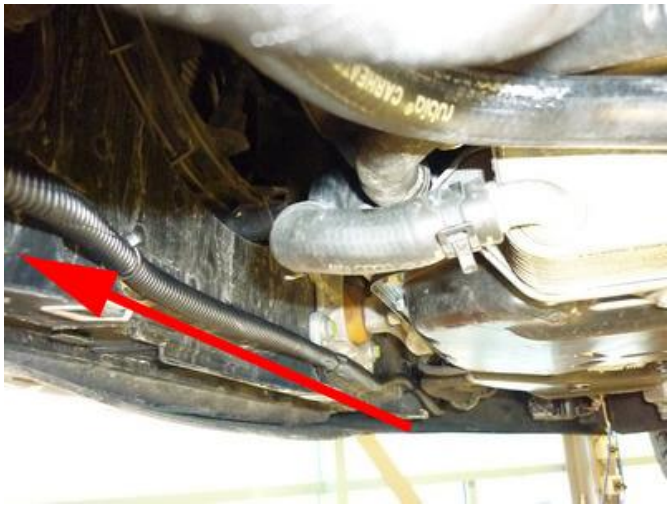
Please observe that there is no damage or fouling to the hoses.

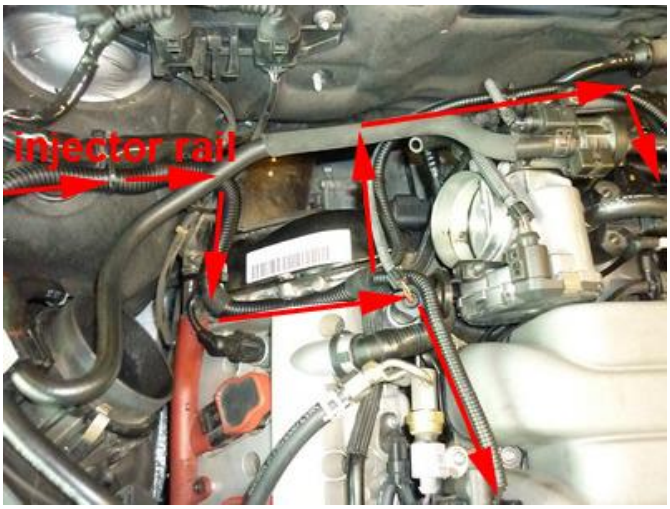
Adapt engine cover
(example Audi A6 AUK)

Mounting the AFC / Injection Module

(example Audi A6 AUK)

Wiring routing
(example Audi A6 AUK)





Switch wiring

Fuse

Mounting the fuel selection switch

(example Audi A6 AUK)

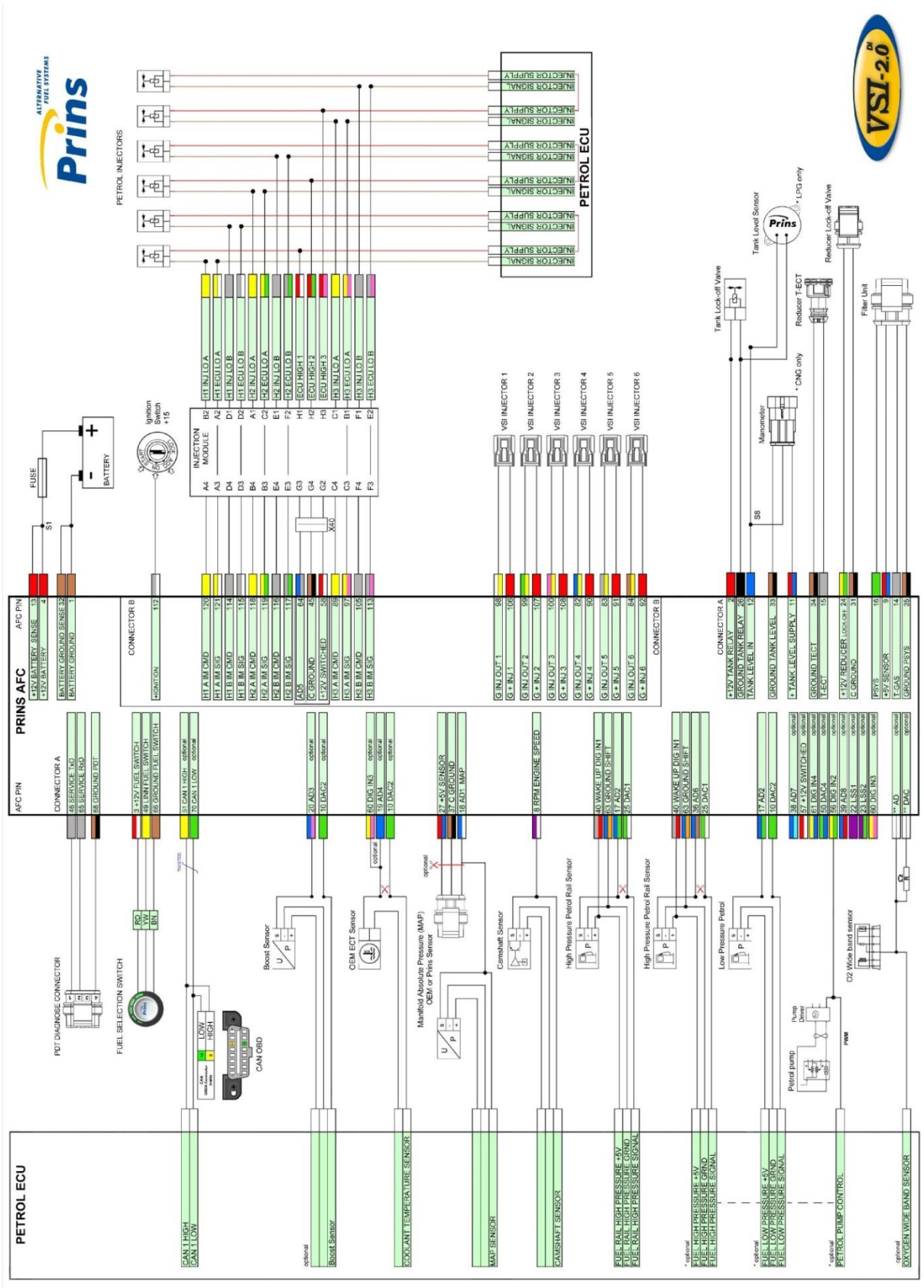
When mounting the switch, only push on its sides.
Pushing the switch hard in the centre may result in damage to the switch.

Remove glove compartment for switch wiring.

Drill a hole for the wiring.

Drill a hole Ø8.3mm for the switch.

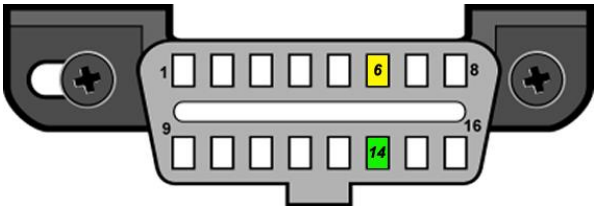
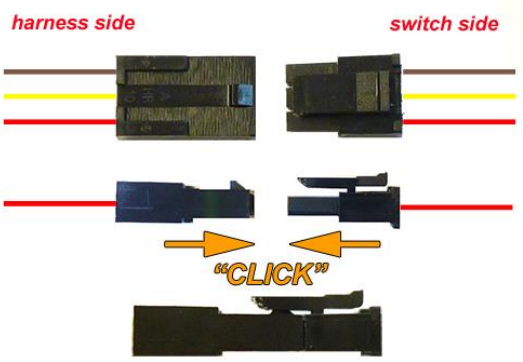
Wiring diagram



Petrol ECU

Electrical connections

Driver room

51 CAN1 High 70 CAN1 Low	Yellow Green	*Connect to EOBD diagnose connector* Pin : 6 Pin : 14
		
3-pole micro connector 66 Ground fuel switch 3 +12V fuel switch 49 LIN fuel switch	Brown-black Red-white Yellow	Connect the 3-pole connector to the Prins fuel selection switch
		

Electrical connections

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

32 1	Ground sense Ground battery	Brown	*Connect to the '–' of the battery; use a ring terminal:*

4	+12V Battery	Red	*Connect to the '+' of the battery; use a ring terminal:*

Do not place the fuse in the holder before having completed the installation of the LPG system.

Electrical connections - SIMOS 6.2A

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

3-pole connector 27 +5V Sensor 37 C ground 18 AD1	 Red-blue Brown-black Blue-white	*For measuring the inlet manifold pressure (MAP).* Cut-off connector and insulate wire. Cut-off connector and insulate wire. Wire colour : **Black-yellow** Wire location : Petrol ECU,**T60, pin 44**

17 & 25		*Interruption high petrol pressure sensor signal.* Wire colour : **Blue-black** Wire location : Petrol ECU, **T60, pin 59**
17 AD2	Blue-green	Sensor side
25 DAC1	Green-white	ECU side

63 Ground shift	Blue-orange	*High petrol pressure sensor signal ground.* Wire colour : **Brown-black** Wire location : Petreol ECU, **T60, pin 40**

40 Wake-up	Grey-red	*High pressure petrol sensor 5Volt supply / car wake-up.* Wire colour : **Blue-red** Wire location : Petrol ECU, **T60, pin 29**

8 RPM engine speed	Purple-white	*For measuring the engine speed.* Wire colour : **Green-black** Wire location : Petrol ECU, **T60, pin 25**

112 +Ignition	Red-grey	*Make a connection to ignition + / contact +.* Do not place the fuse in the holder before having completed the installation of the LPG system. Wire colour : **Black-purple** Wire location : Petrol ECU, **T94, pin 87**

Electrical connections - SIMOS 6.2A

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

VSI measure wire nr. :	**Full coloured / Bicoloured Module position**	**Interrupt petrol injector wire**
H1 (INJ LO A) / H1 (ECU LO A) Petrol injector cyl. **1**	Yellow / yellow-white B2 / A2	Colour : **Black-green** Location : Petrol ECU, **T60, pin 1**
H1 (INJ LO B) / H1 (ECU LO B) Petrol injector cyl. **6**	Grey / grey-white D1 / D2	Colour : **Black-white** Location : Petrol ECU, **T60, pin 2**
H1 (ECU HIGH 1) + Petrol injector (cil **1& 6**)	Red-white H1	Colour : **Brown-red** Location : Petrol ECU, **T60, pin 33**
H2 (INJ LO A) / H2 (ECU LO A) Petrol injector cyl. **2**	Yellow / yellow-green A1 / C2	Colour : **Brown-blue** Location : Petrol ECU, **T60, pin 16**
H2 (INJ LO B) / H2 (ECU LO B) Petrol injector cyl. **4**	Grey / grey-green E1 / F2	Colour : **Brown-white** Location : Petrol ECU, **T60, pin 18**
H2 (ECU HIGH 2) + Petrol injector (cil **2 & 4**)	Red-green H2	Colour : **Green-white** Location : Petrol ECU, **T60, pin 46**
H3 (INJ LO A) / H3 (ECU LO A) Petrol injector cyl. **3**	Yellow / yellow-pink C1 / B1	Colour : **Brown-green** Location : Petrol ECU, **T60, pin 3**
H3 (INJ LO B) / H3 (ECU LO B) Petrol injector cyl. **5**	Grey / grey-pink F1 / E2	Colour : **Black-red** Location : Petrol ECU, **T60, pin 17**
H3 (ECU HIGH 3) + Petrol injector (cil **3 & 5**)	Red-pink H3	Colour : **Green-brown** Location : Petrol ECU, **T60, pin 32**

Electrical connections - SIMOS 8.10

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

VSI measure wire nr. :	Full coloured / Bicoloured	Interrupt petrol injector wire

H1 (INJ LO A)	**yellow**	Injector side
H1 (ECU LO A)	**Yellow-white**	ECU side
IM pos. B2 / A2 **Cyl 1**		Colour : black-green Location : ecu pin **T60/ 31**
H1 (INJ LO B)	**grey**	Injector side
H1 (ECU LO B)	**Grey-white**	ECU side
IM pos. D1 / D2 **Cyl 6**		Colour : red-yellow Location : ecu pin **T60/ 32**
H1 (ECU HIGH 1)	**Red-white**	Colour : grey-red Location : ecu pin **T60/ 3**
IM pos. H1		

H2 (INJ LO A)	**yellow**	Injector side
H2 (ECU LO A)	**Yellow-green**	ECU side
IM pos. A1 / C2 **Cyl 2**		Colour : brown-blue Location : ecu pin **T60/ 33**
H2 (INJ LO B)	**grey**	Injector side
H2 (ECU LO B)	**Grey-green**	ECU side
IM pos. E1 / F2 **Cyl 4**		Colour : brown Location : ecu pin **T60/ 34**
H2 (ECU HIGH 2)	**Red-green**	Colour : red-purple Location : ecu pin **T60/ 19**
IM pos. H2		

H3 (INJ LO A)	**yellow**	Injector side
H3 (ECU LO A)	**Yellow-pink**	ECU side
IM pos. C1 / B1 **Cyl 3**		Colour : brown-green Location : ecu pin **T60/ 46**
H3 (INJ LO B)	**grey**	Injector side
H3 (ECU LO B)	**Grey-pink**	ECU side
IM pos. F1 / E2 **Cyl 5**		Colour : red-black Location : ecu pin **T60/ 47**
H3 (ECU HIGH 3)	**Red-pink**	Colour : grey-green Location : ecu pin **T60/ 1**

Electrical connections - SIMOS 8.10

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

			High pressure petrol sensor supply 5V Wire colour : white-yellow Wire location : ecu pin **T60/ 35**
40 Wake-up		Grey-red	

			High pressure petrol sensor ground. Wire colour : brown Wire location : ecu pin **T60/ 50**
63 Ground Shift		Blue-orange	

			For measuring the engine speed signal. Wire colour : white-yellow Wire location : ecu pin **T60/ 55**
8 RPM		Purple-white	

17 & 25			*High pressure petrol sensor signal interruption.* Wire colour : green-yellow Wire location : ecu pin **T60/ 59**
17 AD 2		Blue-green	Sensor side
25 DAC 1		Green-white	Petrol ecu side

3-pole connector 27 +5V Sensor 37 C ground 18 AD1		Cut-off connector Red-blue Brown-black Blue-white	*For measuring the inlet manifold pressure (MAP).* insulate insulate Wire colour : yellow-blue Wire location : ecu pin **T94/ 7**
18 AD 1			

112			*Connect to +ignition / contact+ (+15).* *Do not place the fuses in the holder before having completed the installation of the LPG system.* Wire colour : black-purple Wire location : ecu pin **T94/ 87**
112 + Ignition		Red-grey	

Electrical connections

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

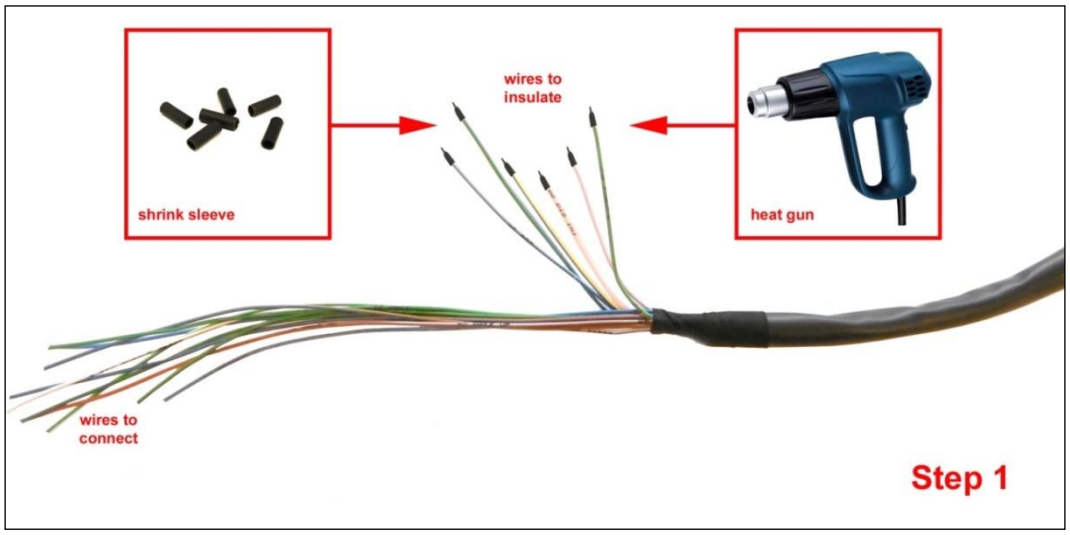
Wire number / code	Wire colour	Connection
98 98 G INJ OUT **1**	**White-yellow**	Connector VSI-injector to cylinder **1**. right side
106 106 G + INJ 1	**red**	
99 99 G INJ OUT **2**	**Green-yellow**	Connector VSI-injector to cylinder **2**.
107 107 G + INJ 2	**red**	
100 100 G INJ OUT **3**	**Pink-yellow**	Connector VSI-injector to cylinder **3**.
108 108 G + INJ 3	**red**	
82 82 G INJ OUT **4**	**Blue-yellow**	Connector VSI-injector to cylinder **4**.
90 90 G + INJ 4	**red**	
83 83 G INJ OUT **5**	**Grey-yellow**	Connector VSI-injector to cylinder **5**.
91 91 G + INJ 5	**red**	
84 83 G INJ OUT **6**	**Brown-yellow**	Connector VSI-injector to cylinder **6**.
92 91 G + INJ 6	**red**	

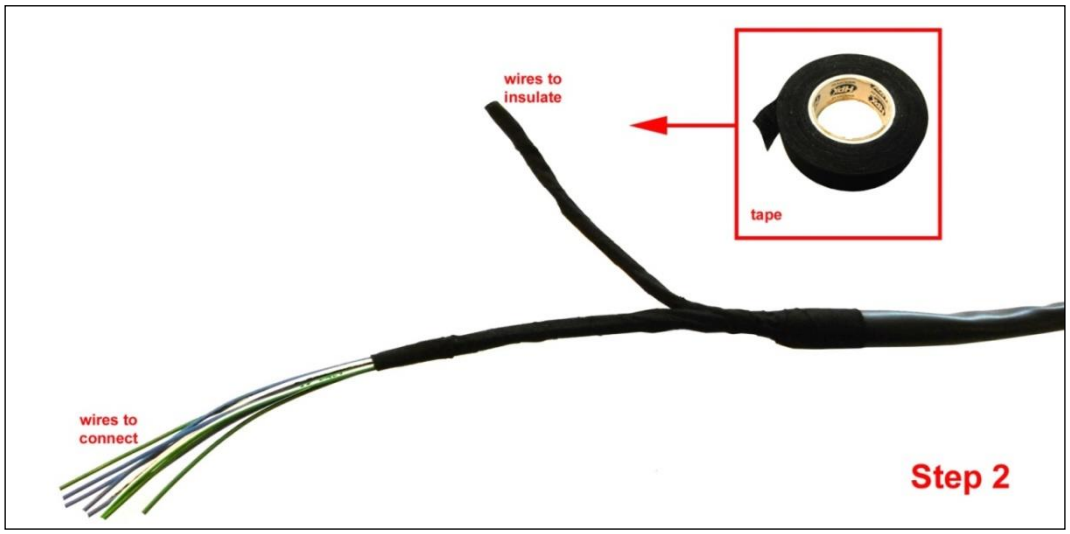
Example from other Audi V6

Electrical connections – Insulate

10	DAC2	Green	***Insulate***
19	AD4	Blue	***Insulate***
20	AD3	Blue-pink	***Insulate***
22	LSS1	Purple	***Insulate***
23	LSS2	Purple-green	***Insulate***
36	AD6	Blue-brown	***Insulate***
38	AD7	Blue-lightblue	***Insulate***
39	AD8	Blue-red	***Insulate***
50	DAC4	Green-blue	***Insulate***
56	DI2	Yellow-green	***Insulate***
60	DI3	Yellow-pink	***Insulate***
61	DI4	Yellow-blue	***Insulate***
74	DAC3	Green-pink	***Insulate***
Insulate additional loose wires			

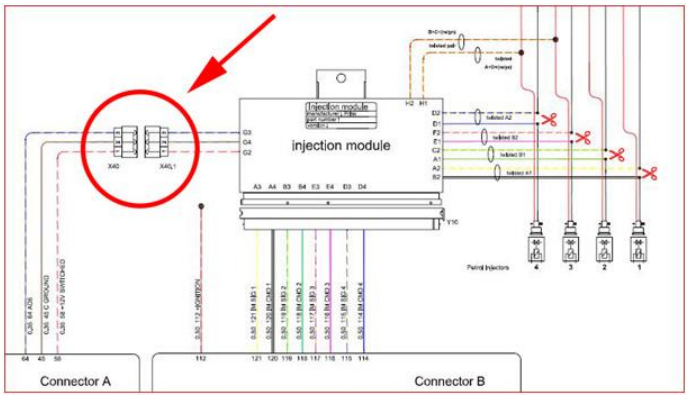
Electrical connections – How to insulate not used wires





Electrical connections

Connectors in wiring loom

2-pole blue connector 15 T-ECT 34 Ground T-ECT	 Grey Brown-black	*For measuring the engine coolant temperature (Tect).* Connect the connector to the reducer temperature sensor.
4-pole connector 35 Ground Psys 14 T-Gas 9 +5 Volt sensor 16 Psys	 Brown-black Grey Red-blue Green	*For measuring gas pressure and gas temperature.* Connect the connector to the filter unit sensor.
2-pole connector 24 +12V reducer lock-off 31 C Ground	 Yellow-green Brown-black	Connect the connector to the reducer lock-off valve.
4-pole connector 46 Service TxD 65 Service RxD 68 Ground PDT	 Grey Grey Brown-black	Diagnose connector.
Tank wiring loom 2 +12V Tank relay 12 Tank level IN 26 Ground tank relay	 Red Blue Black	 Connect to the tank lock-off. Connect the tank level gauge. Connect to the tank lock-off.
Wiring loom link 45 C ground 58 +12V switched 64 AD5	 Brown-black Red-white Blue-grey	Connection from AFC connector A to connector B 

Optional:

3-pole connector 11 + manometer 12 tank level in 33 ground manometer	 Red Blue Brown	***Cut off connector and insulate wires***

Checklist after installation

1. Connect the Prins Diagnostic Tool and run the VSI diagnostic program.
   Install the VSI fuse, 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 system, you must activate the VSI computer with the diagnostic software. When the VSI computer has not been activated, the switch will keep blinking. To activate the VSI computer, select function activate ECM in the diagnostic software.

3. Check whether the program in the VSI computer matches with the car (dedicated engine set) :
   Refer the car description in the diagnostic software (Basic → Identification) and compare these with the set number.

4. The system will switch over to LPG as soon as the temperature of the coolant becomes higher than parameter 70 - Switch over ECT.

5. Check all components and connections for any gas leakage (use a LPG leak detector device or a fluid detection like soap). Caution for moving and rotating parts in the engine compartment !

6. Let the engine run warm on petrol >80°C.
   Check if the evaporator heats up.
   Check the engine signals, petrol injection time, RPM, ECT, lambda, MAP signal, petrol pressure signal. Let the engine run idle on LPG.
   Adjust the evaporator pressure. Refer to Basic → System in the diagnostic software for the idle level value set.
   Adjust the 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 to high.

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

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

9. Take a test drive and check the drivability on LPG and petrol.

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