



Installation manual PART 2/2

MANUFACTURER	VAG
TYPE	(based on: Audi S4 8K5 S4Y)
ENGINE DISPLACEMENT	2995 cc
NUMBER OF VALVES	24
ENGINE CODE / NUMBER - OUTPUT	CAJA – 213kW / CCAA – 220kW
ENGINE CODE / NUMBER - OUTPUT	CGWA – 213kW / CGWB – 220kW
ENGINE CODE / NUMBER - OUTPUT	CGWC – 245kW / CGWD – 228kW / CTUB – 245kW
ENGINE CODE / NUMBER - OUTPUT	CTUC – 200kW / CTUD – 260kW / CTWB -206kW
FIRING ORDER	1-4-3-6-2-5
VEHICLE CATEGORIES	M
TRANSMISSION	AT
VERSION	AFC-2.1 DI
TYPE VSI INJECTOR	KN9 - 82cc
TYPE INJECTION MODULE	Gen2 Type 2 – 6 Cyl
PETROL ECU MANUFACTURER / CODE	Continental Simos 8.30 / 8.31 / 8.33 / 8.50 / 8.51
MODEL YEAR:	2006-
SYSTEM APPROVAL NUMBER (R115)	(Not all engine codes, check list!) E4-#115R-000020 / VSI-LPG 31
LOCATION R115 SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	366/122001/A
MANUAL NUMBER	076/2619900-3
DATE	2020-03-31

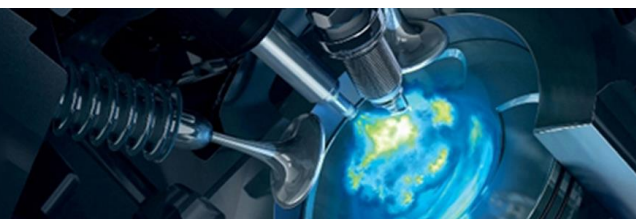


TABLE OF CONTENTS

Manual updates / revision	2
General instructions	3
Required equipment / tools / materials for installing a complete system	4
Vehicle check	4
Tightening moments	5
Basic System Overview	5
VSI approval numbers	7
VSI component location overview	8
Mounting the reducer	9
Water connections	10
Remove inlet manifold	11
Overpressure / MAP connection	12
Overpressure / MAP connection	13
Mounting the inlet manifold couplings - TIPS	14
Mounting the inlet manifold couplings	15
Mounting the inlet manifold couplings	16
Mounting the inlet manifold couplings with PTFE hoses	17
Mounting the inlet manifold couplings	18
Mounting the VSI injector rail - Bank 1	19
Mounting the VSI injector rail - Bank 2	20
Mounting the Prins filter unit	21
LPG hoses	22
Mounting the AFC & Injection Module	23
Wiring routing	24
Petrol ecu	25
Mounting the fuel selection switch	26
Electrical connections	27
Basic Wiring Diagram	28
Electrical connections	29
Electrical connections – Insulate	30
Electrical connections – How to insulate not used wires	30
Electrical connections	31
Electrical connections	32
Electrical connections	33
Electrical connections	34
Electrical connections	35
Checklist after installation	36

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



Manual updates / revision

Rev. nr	Rev. Date	Subject update
-	2018-12-07	Release
1	2019-06-28	Updated IM
2	2019-09-13	General update with mainly info
3	2020-03-31	Added CCA, CTUB, CTUC, CTUD & CTWB engine code



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 and alarm system.
- Do not place the main fuse into the fuse holder before having completed the installation of the VSI system.
- The AFC has to be activated by means of the diagnosis software.
- In the unlikely event the AFC fails, it will automatically switch over to petrol.
Never disconnect the AFC 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 no. 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 Ø4 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)



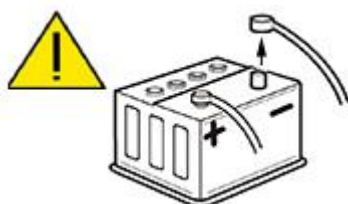
Tightening moments

	Nm	Spanner mm
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 :

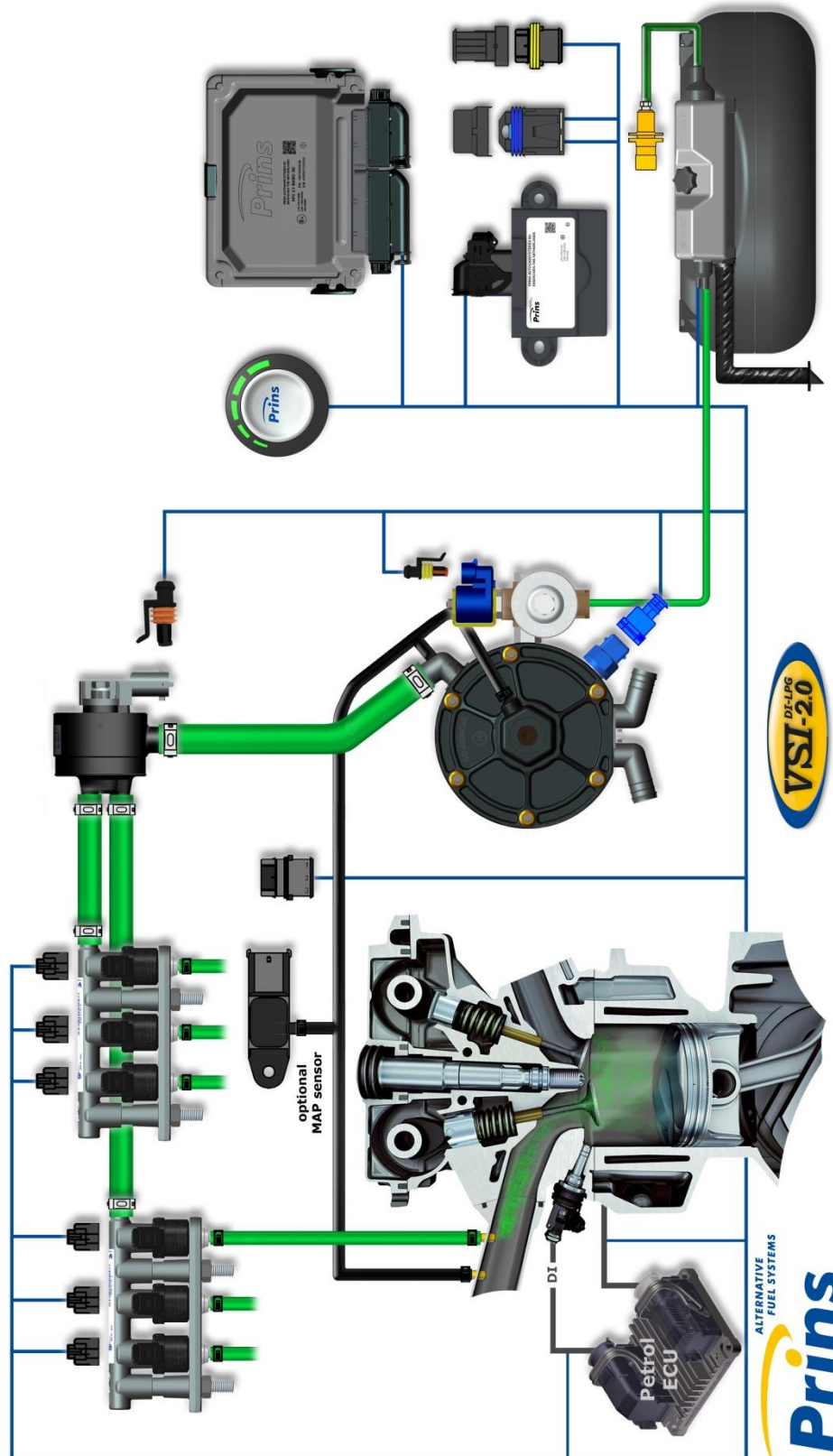


= IMPORTANT, CAUTION



= WEAR SAFETY GOGGLES

Basic System Overview

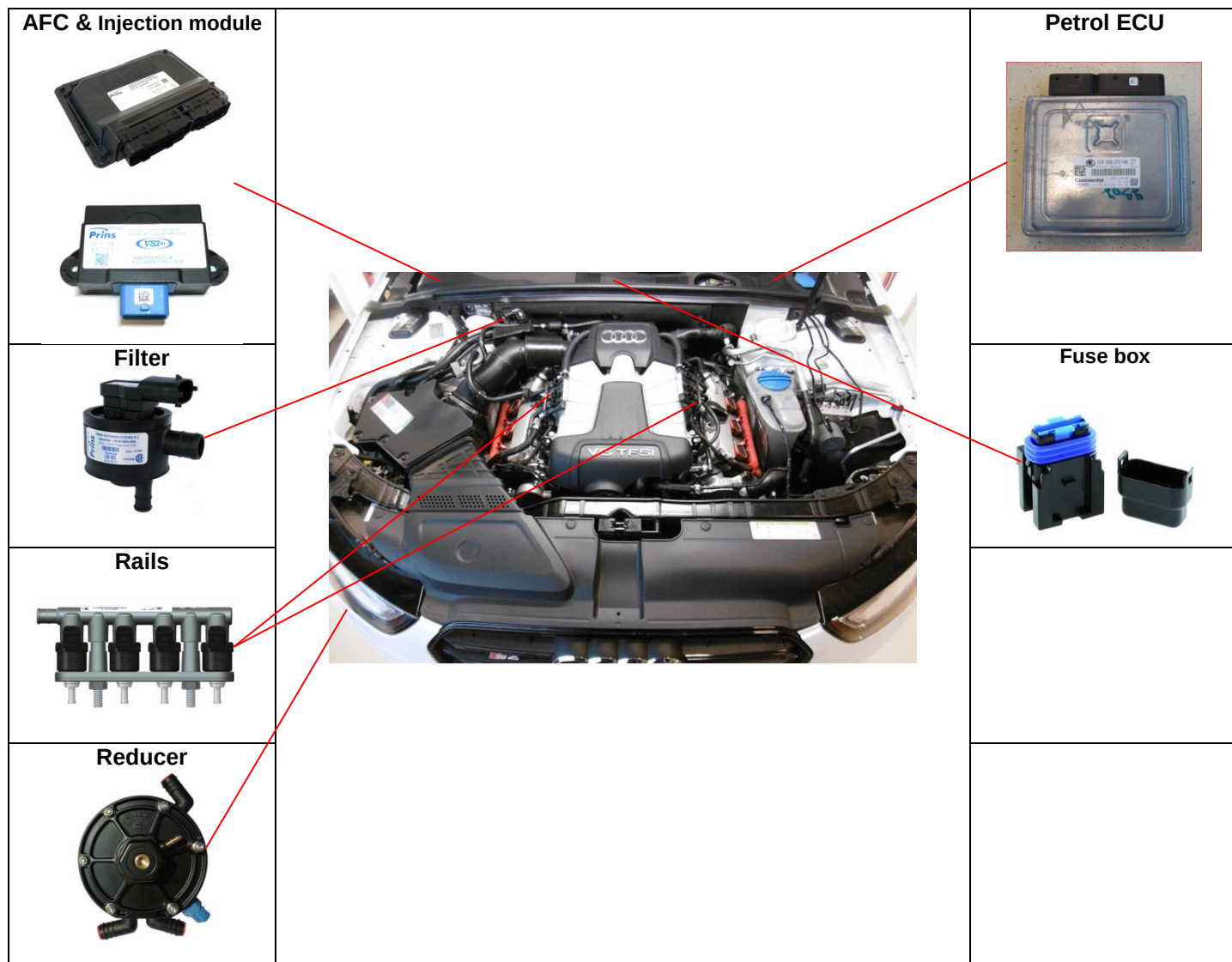


VSI approval numbers

	
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 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 S4)



If applicable, R115 approval sticker :
Right side centre door post

Mounting the reducer

(example Audi S4)



Top view



Water connections

(example Audi S4)

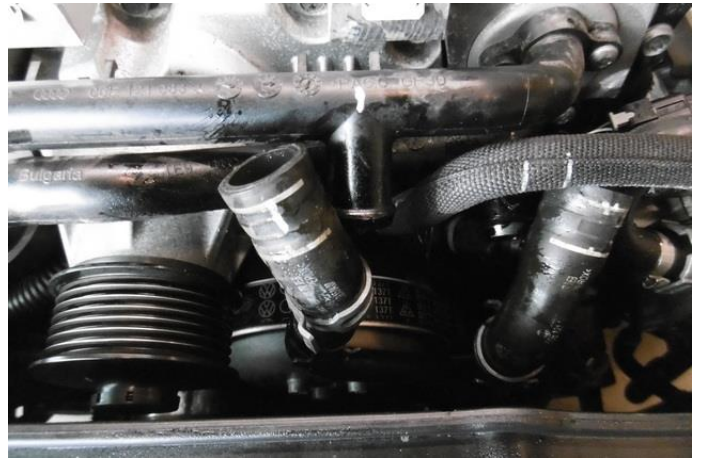
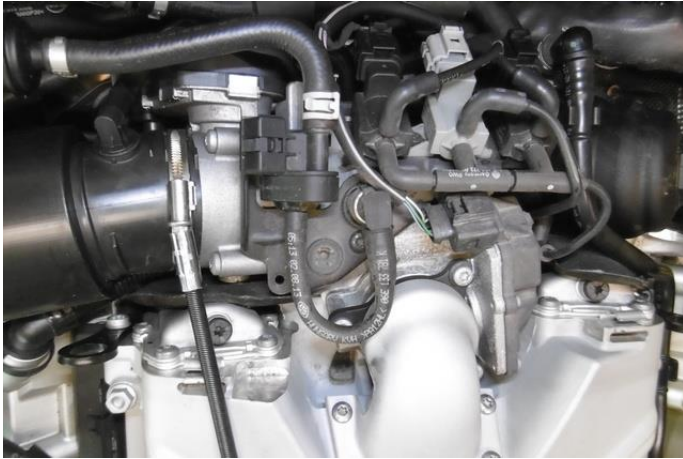


Right side engine, bank 1

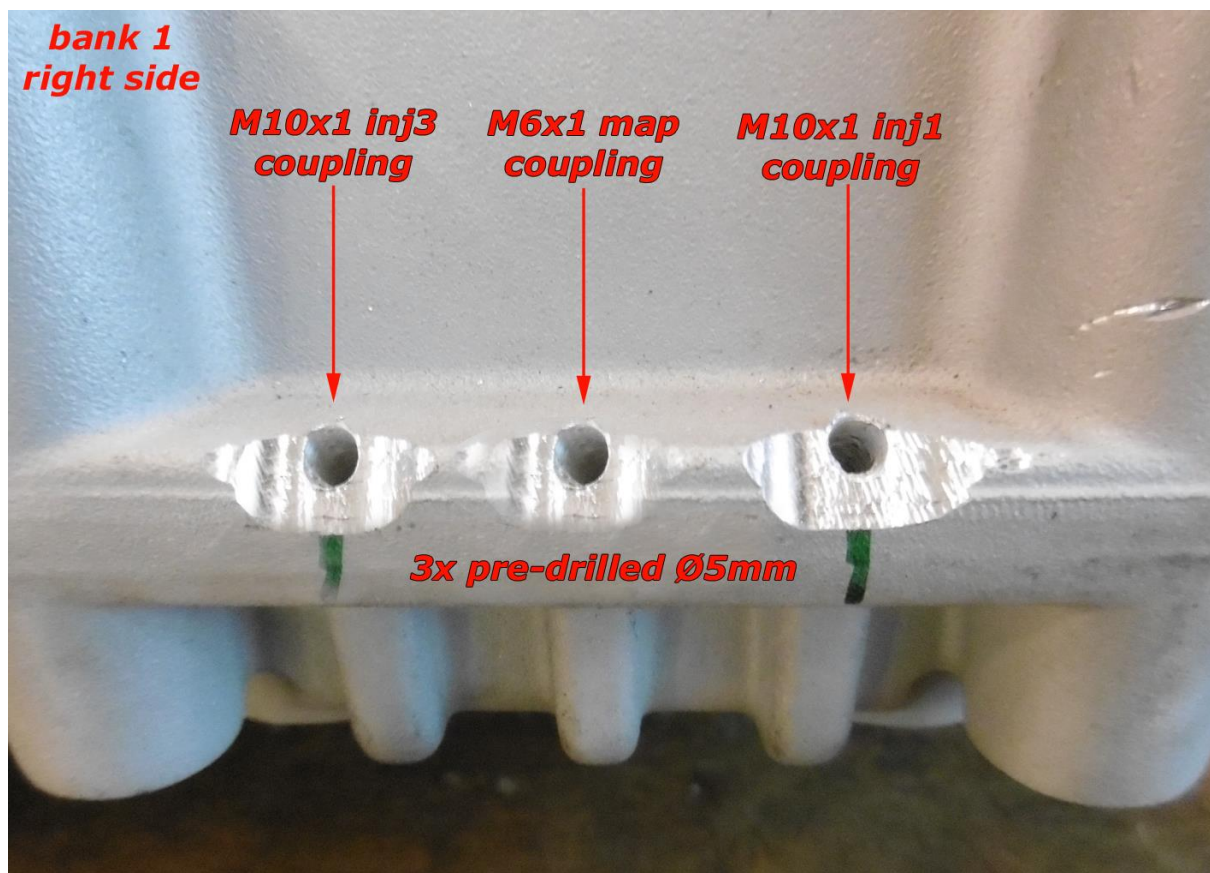
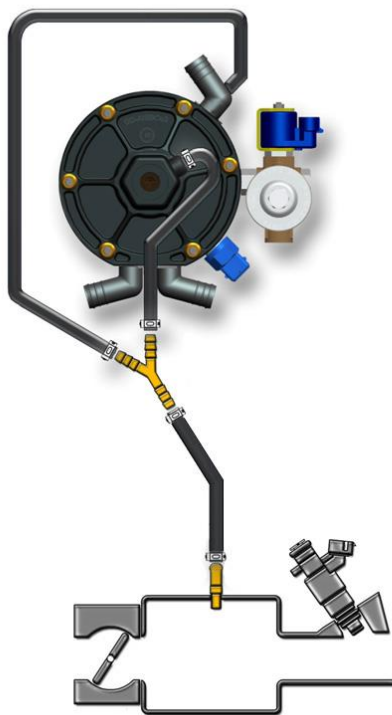


In serial

Remove inlet manifold

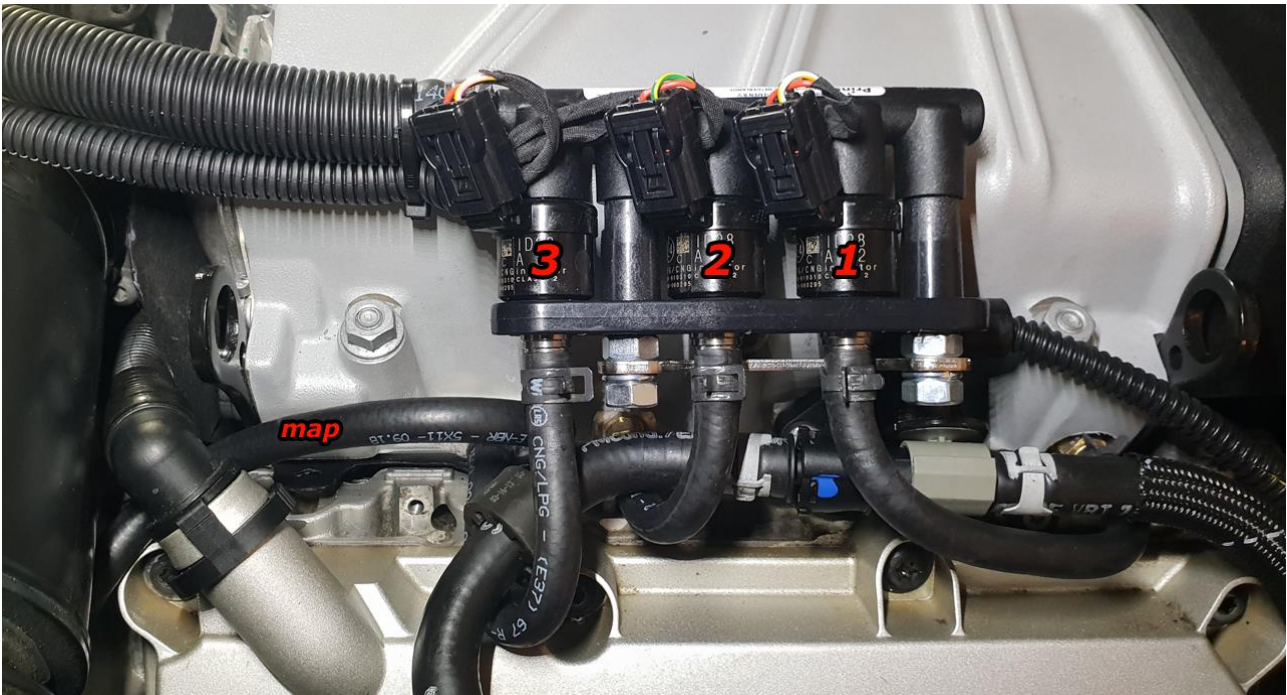
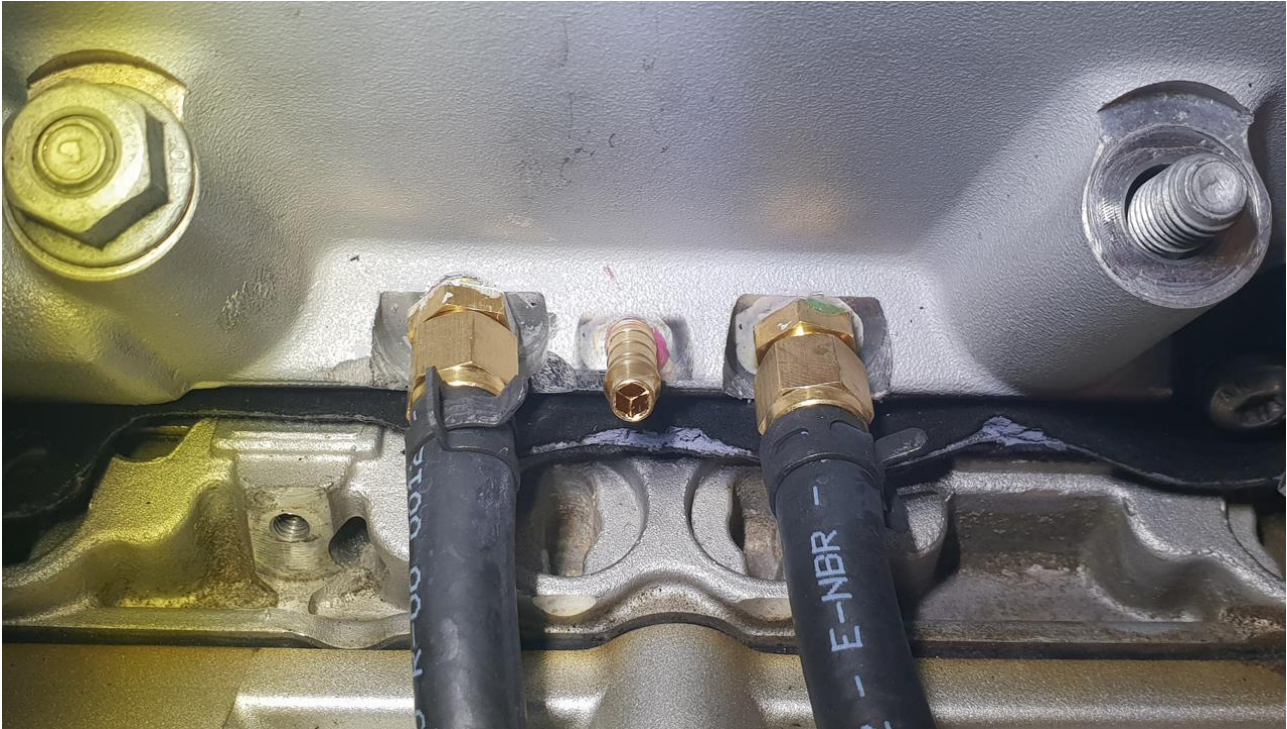


Overpressure / MAP connection

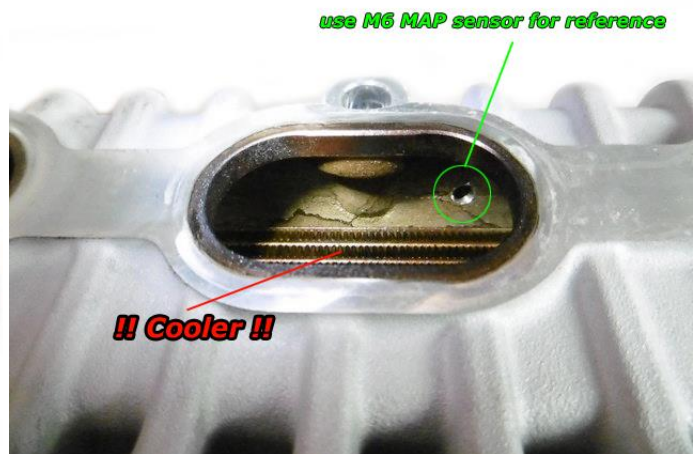
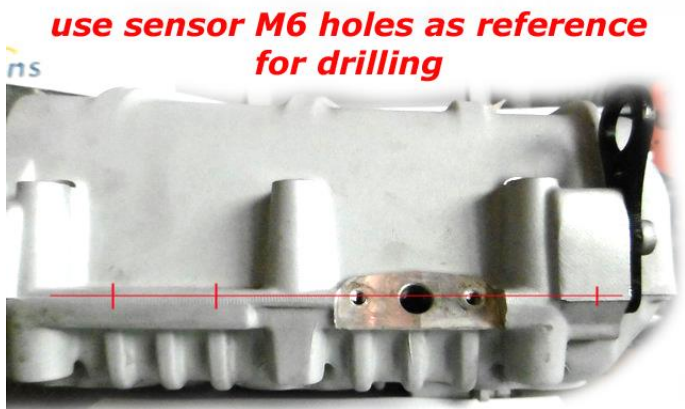
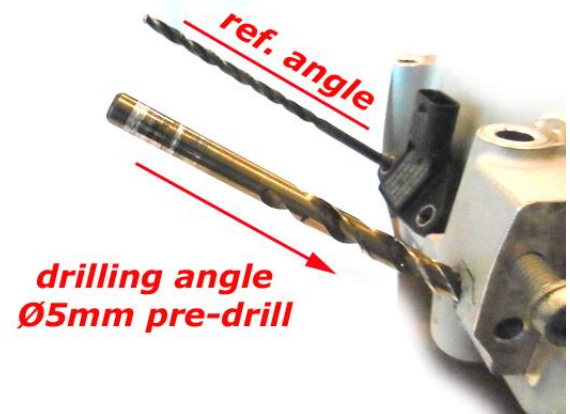
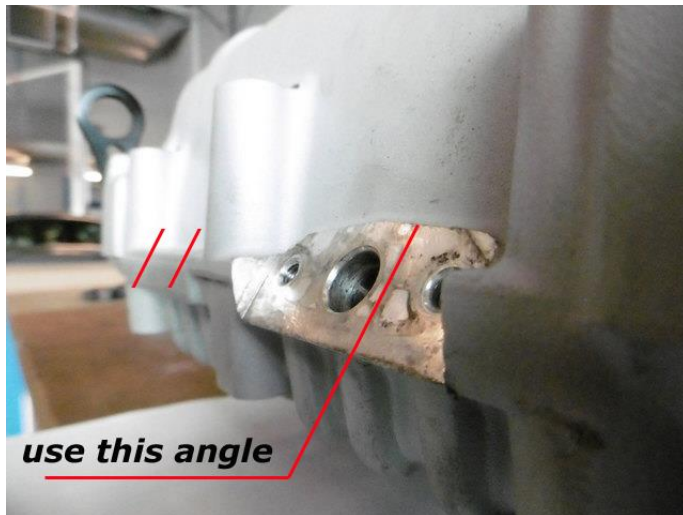


Drill Ø5mm, cut M6x1 (also see next page)

Overpressure / MAP connection

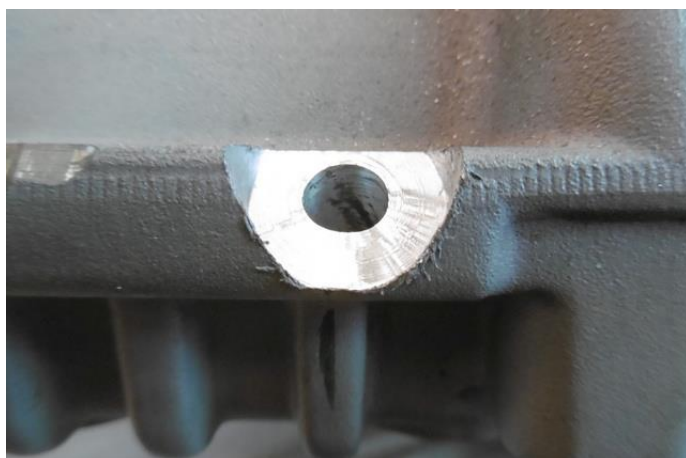
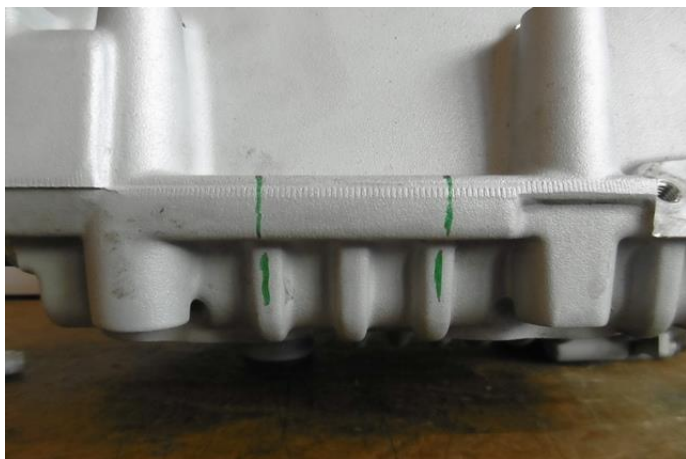


Mounting the inlet manifold couplings - TIPS



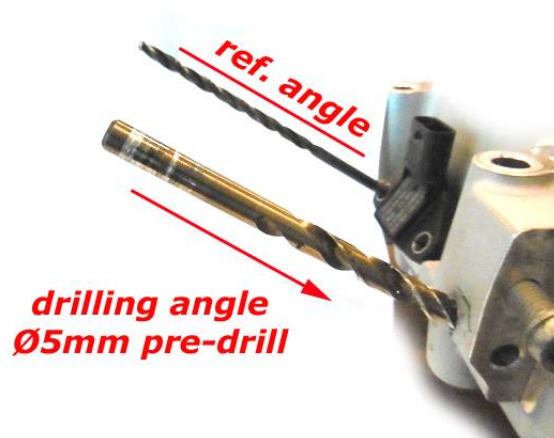
Pre-drill under same angle as MAP M6 bolt hole / USE a milling tool !

Mounting the inlet manifold couplings

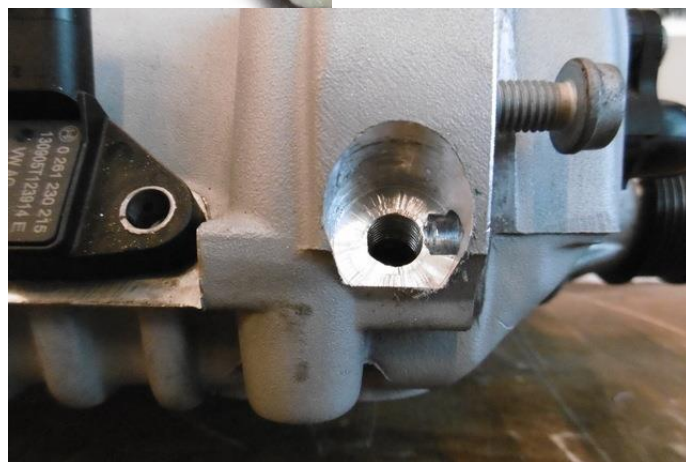


Drill Ø8.5mm / cut M10x1

Mounting the inlet manifold couplings



Milling

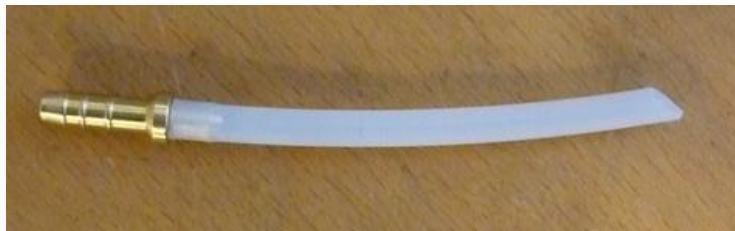
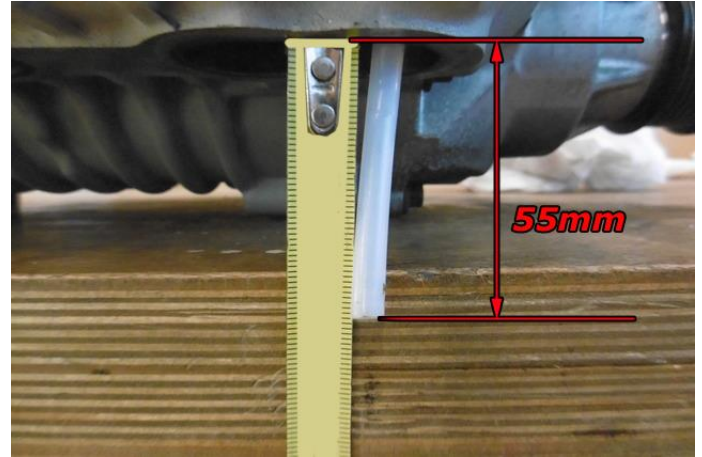
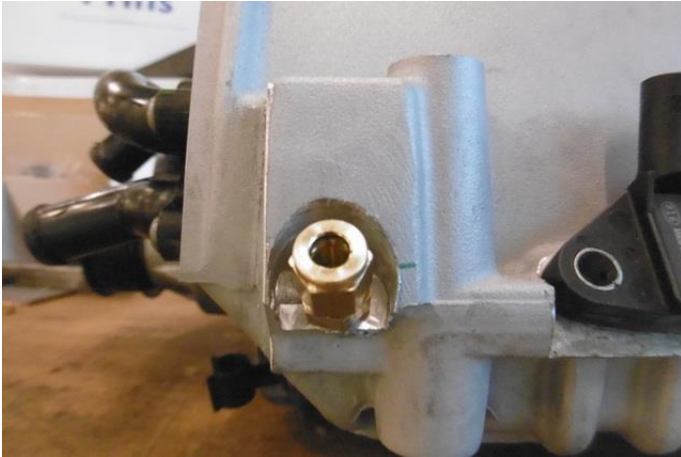


Drill Ø8.5mm, cut M10x1

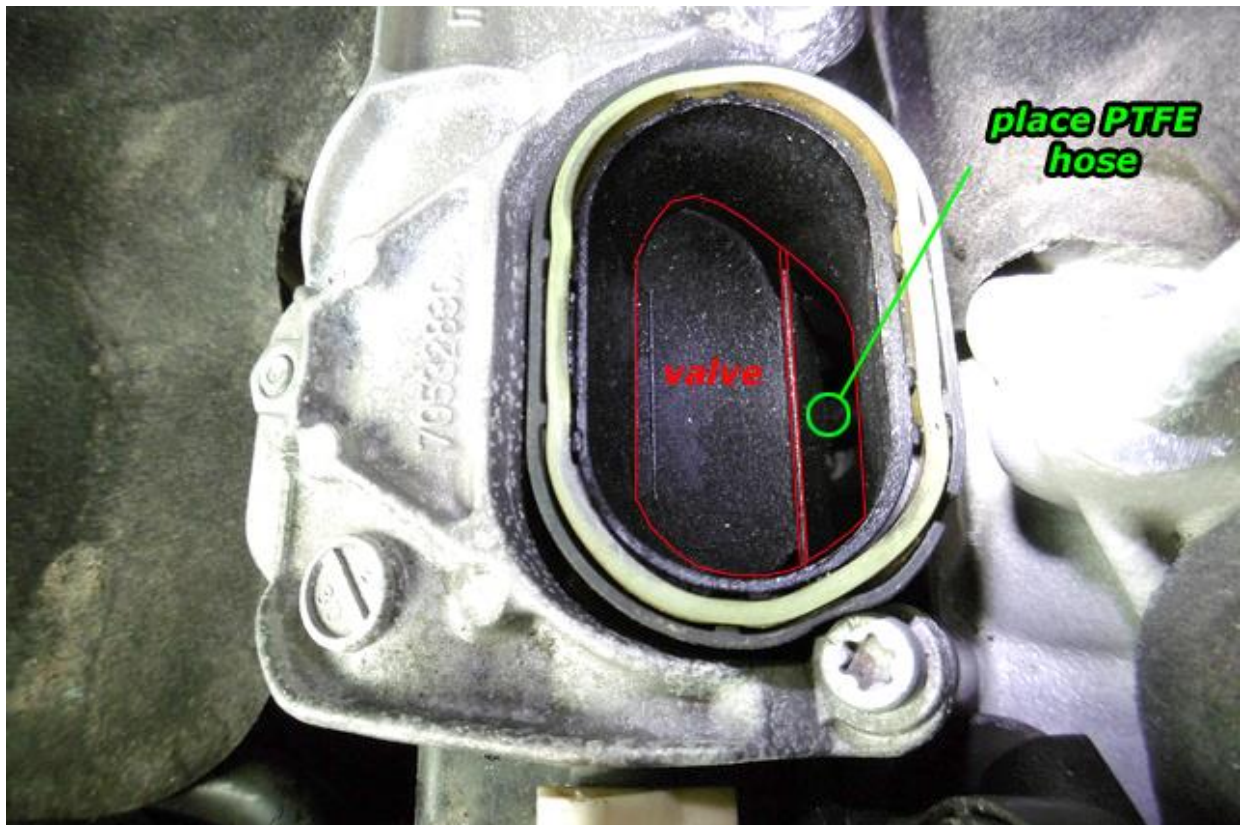


M10x1

Mounting the inlet manifold couplings with PTFE hoses



(example PTFE hose)



Mounting the inlet manifold couplings

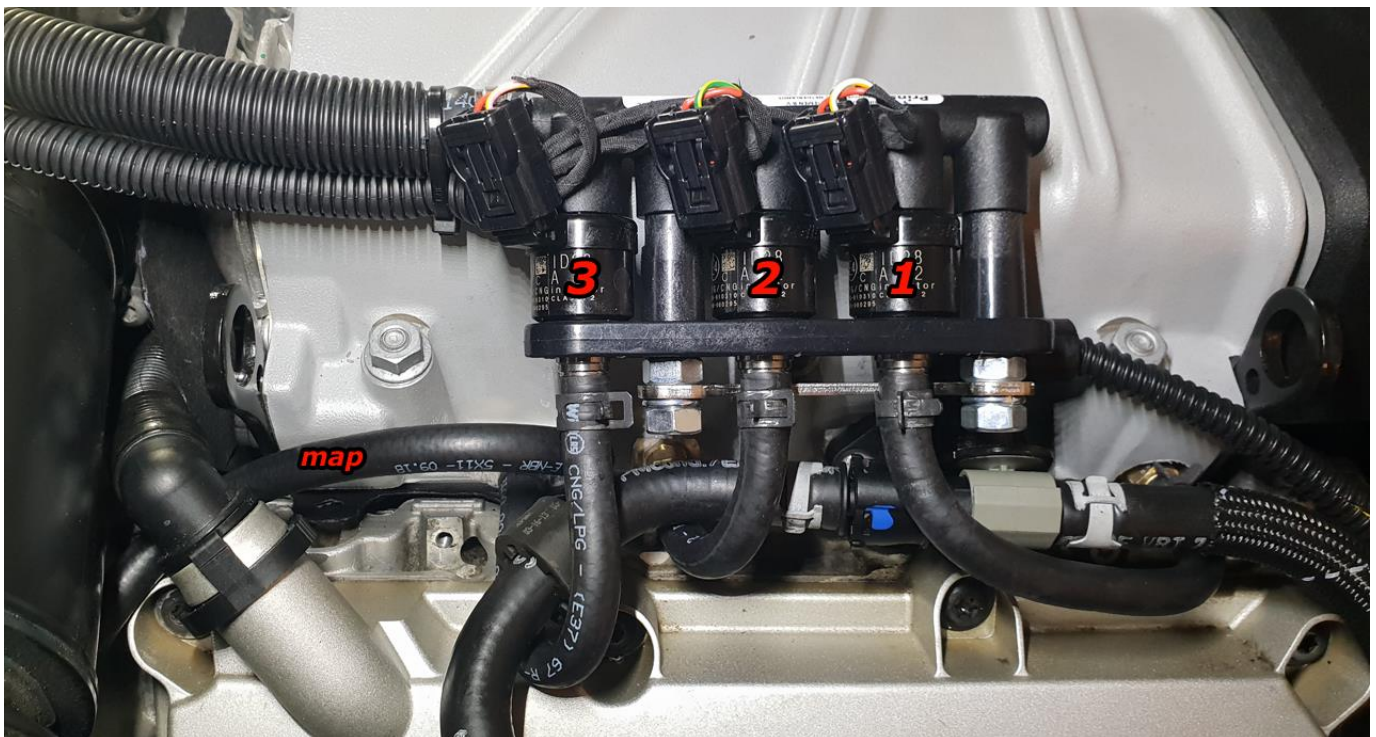
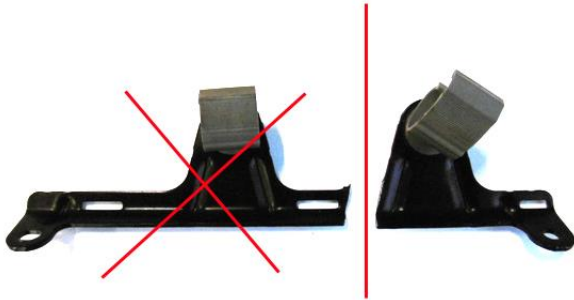
Bank 1 right side



Bank 2 left side



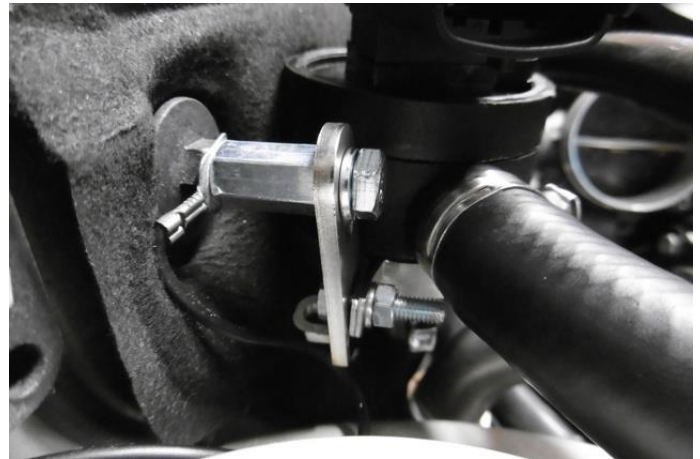
Mounting the VSI injector rail - Bank 1



Mounting the VSI injector rail - Bank 2



Mounting the Prins filter unit (example Audi S4)



LPG hoses

(based on Audi S4)

<i>Hose (Ø in mm)</i>	<i>From component</i>	<i>To component</i>	<i>Hose length (cm)</i>
16	Reducer	Prins filter unit	125
11	Prins filter unit	VSI injector rail B1	85
11	Prins filter unit	VSI injector rail B2	100
5	Reducer overpressure	Y-piece	10
5	Reducer MAP connection	Y-piece	4
5	Y-piece	Inlet manifold coupling (vacuum)	150
5	VSI injector 1	Inlet manifold coupling cyl.1	16
5	VSI injector 2	Inlet manifold coupling cyl.2	9
5	VSI injector 3	Inlet manifold coupling cyl.3	14
5	VSI injector 4	Inlet manifold coupling cyl.4	18
5	VSI injector 5	Inlet manifold coupling cyl.5	9
5	VSI injector 6	Inlet manifold coupling cyl.6	9

General info.

Cut the LPG hoses on length.

Cut the PTFE white hoses on length, sticking out 55mm.

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



Mounting the AFC & Injection Module

(Example Audi S4)



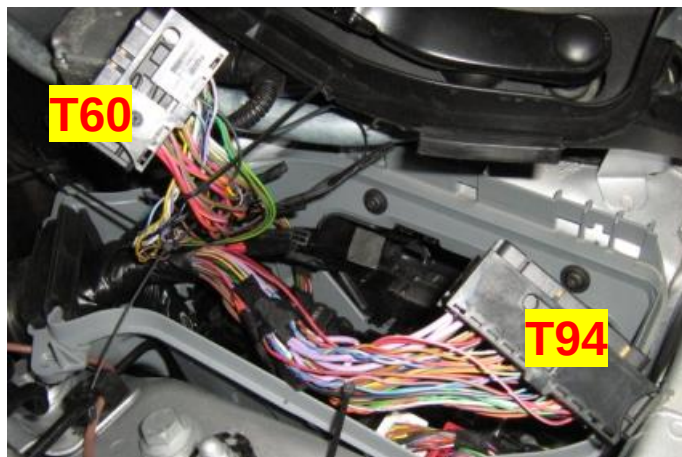
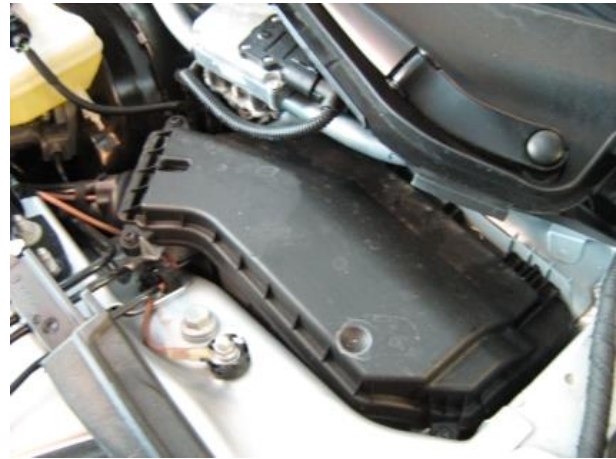
Adapt cover

Wiring routing

(Example Audi S4)



Petrol ecu (example Audi S4)



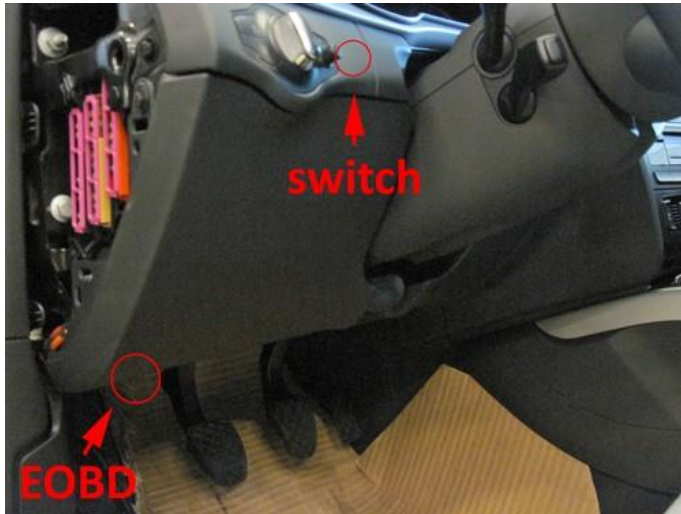
Switch wiring

Mounting the fuel selection switch

(Examples Audi S4)



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



Mark hole for drilling on the right side of the light switch. Or:



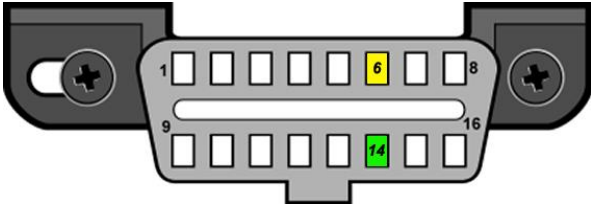
Or:



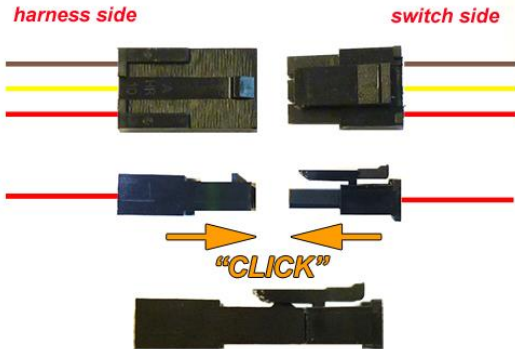
Electrical connections

Driver room

				Connect to EOBD diagnose connector.
51	CAN1 High		Yellow	Pin : 6
70	CAN1 Low		Green	Pin : 14



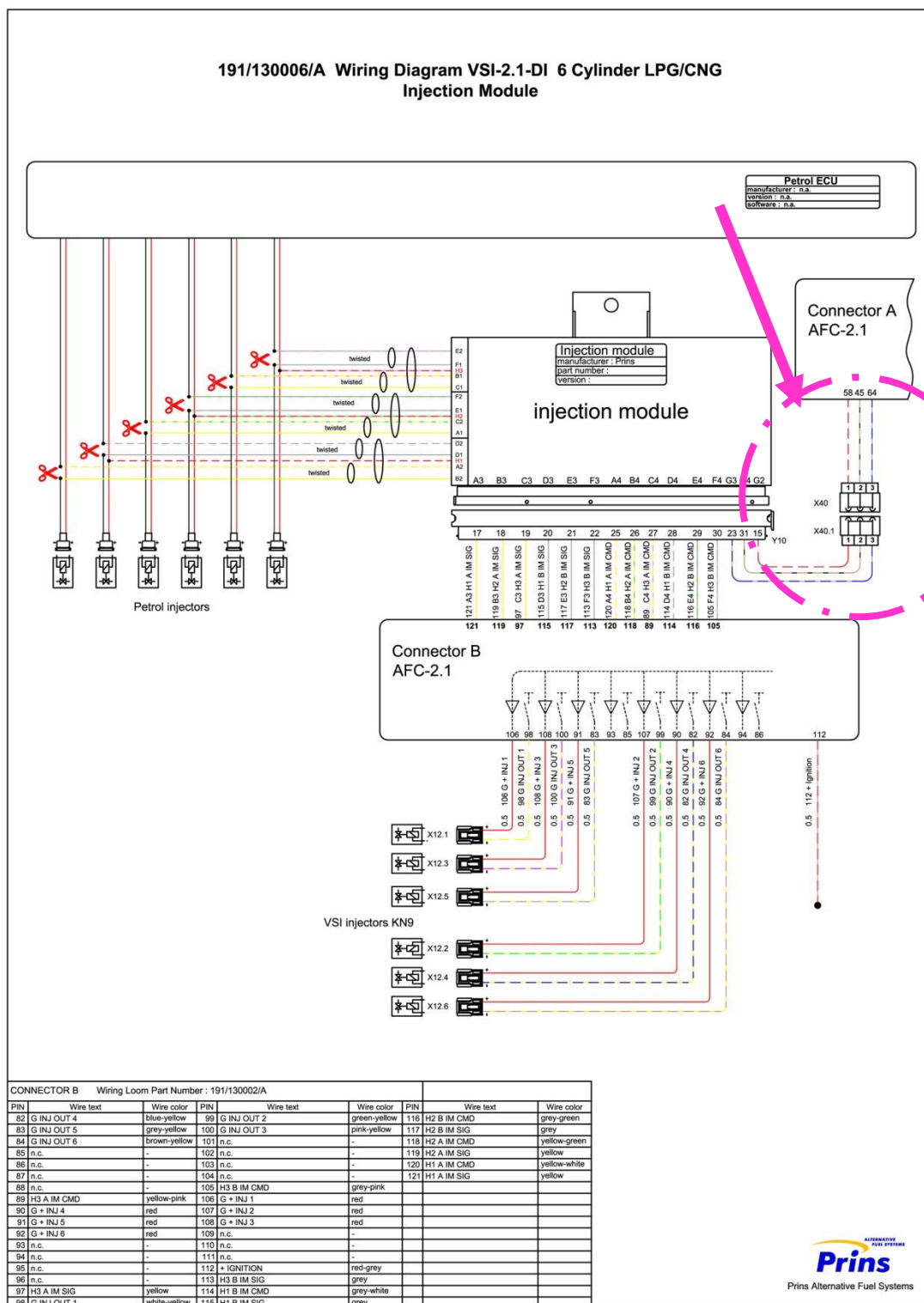
3-pole micro connector				Connect to the Prins fuel selection switch.
66	Ground fuel switch		Brown-black	
3	+12V fuel switch		Red-white	
49	LIN fuel switch		Yellow	



Electrical connections

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

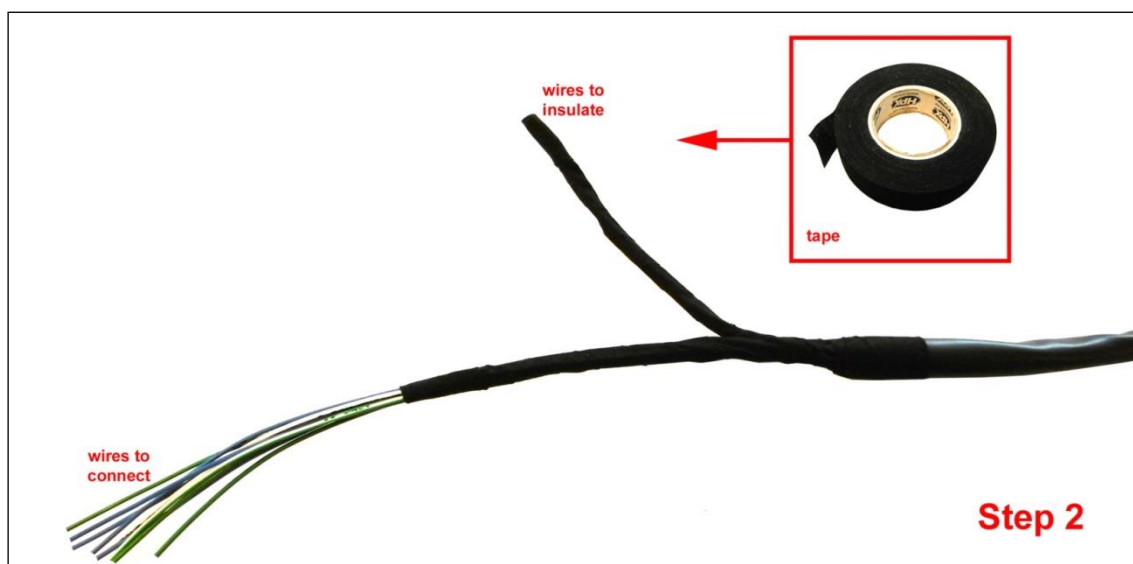
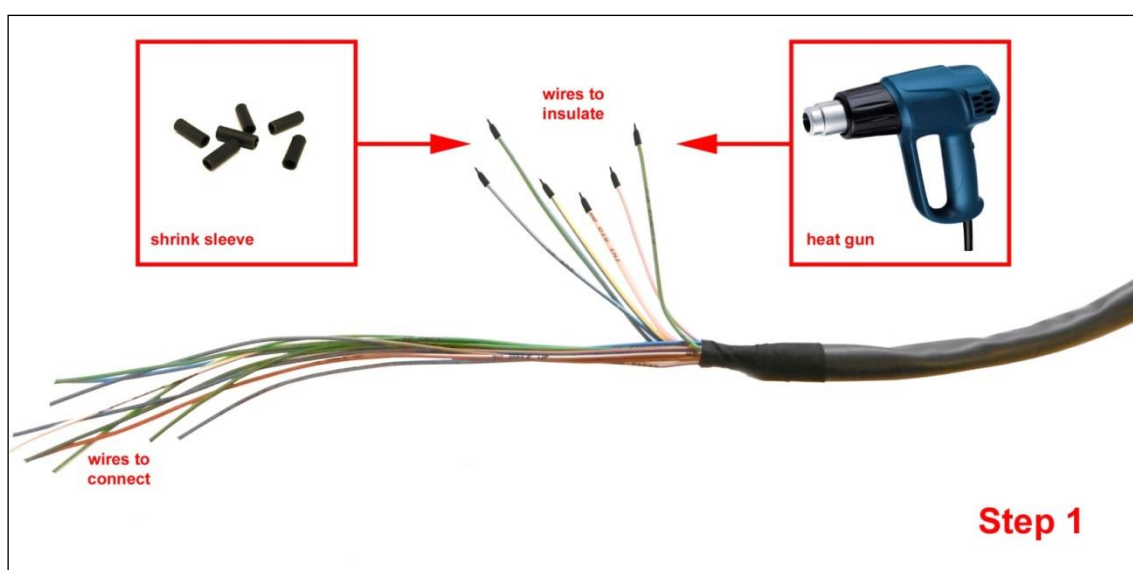
Connector Injection Module



Electrical connections – Insulate

19	AD4			Blue	
20	AD3			Blue-pink	
22	LSS1			Purple	
23	LSS2			Purple-green	
38	AD7			Blue-light Blue	
39	AD8			Blue-red	
43	+12 Valve 2			Red-white	
50	DAC4			Green-blue	
60	DIG IN3			Yellow-pink	
61	DIG IN4			Yellow-blue	
62	C Ground			Brown-black	
74	DAC3			Green-pink	

Electrical connections – How to insulate not used wires



Electrical connections

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

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



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

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	



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**, (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
IM pos. H1			Location : ecu pin T60/ 3

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
IM pos. H2			Location : ecu pin T60/ 19

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

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

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

17 & 10			<i>Low pressure petrol sensor signal interruption.</i> Wire colour : green Wire location : ecu pin T60/ 44
17	AD 2		Blue-brown
10	DAC 2		Green

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

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

36 & 25			<i>High pressure petrol sensor signal interruption.</i> Wire colour : green-yellow Wire location : ecu pin T60/ 59
36	AD 6		Blue-brown
25	DAC 1		Green-white

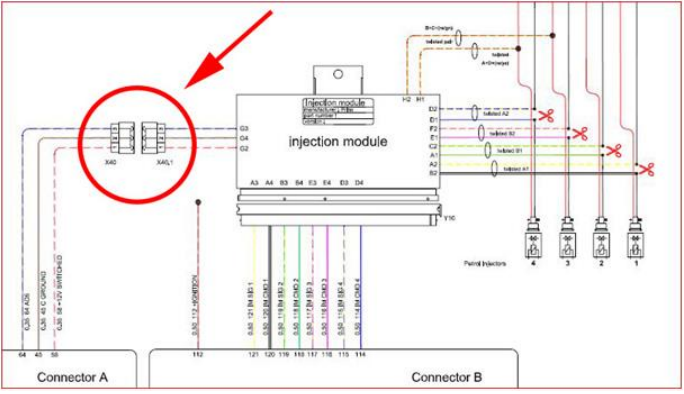
3-pole connector 27 +5V Sensor 37 C ground 18 AD1	Cut-off connector Red-blue Brown-black Blue-white		<i>For measuring the inlet manifold pressure (MAP).</i> insulate insulate Wire colour : yellow-blue Wire location : ecu pin T94/ 7
18 AD 1			

56			<i>Pump driver PWM</i> Wire colour : red-violet Wire location : ecu pin T94/ 42
56	DI2		Yellow-green

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

Electrical connections

Connectors in wiring loom

2-pole blue connector 15 T-ECT 34 Ground T-ECT	Grey Brown-black	<i>For measuring the engine coolant temperature (Tect).</i> 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	<i>For measuring gas pressure and gas temperature.</i> 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 AFC with the diagnostic software.
When the AFC has not been activated, the switch will keep blinking.
To activate the AFC, select function *activate ECM* in the diagnostic software.
3. Check whether the program in the AFC 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 and 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 too 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.

