



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



Installation manual Dedicated PART 2/2

MANUFACTURER	Skoda
TYPE	Octavia
ENGINE DISPLACEMENT	1200
NUMBER OF VALVES	16
ENGINE CODE / NUMBER	CBZB
VEHICLE CATEGORIES	M
TRANSMISSION	MT
VERSION	Direct LiquiMax-2.0
PETROL ECU MANUFACTURER / CODE	Simos 10.10
HIGH PRESSURE PETROL PUMP	Hitachi Type 2
HIGH PRESSURE PETROL INJECTOR	Magnetti Marelli 03F 906 036B
MODEL YEAR:	2011
SYSTEM APPROVAL NUMBER (R115)	E4-115R-000010 / DLM-LPG 03
LOCATION SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	364/070019/A
MANUAL NUMBER	076/3601600
DATE	2014-04-03

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Version 2012-11-02 D



TABLE OF CONTENTS

General instructions	2
Required equipment / tools / materials for installing a complete system	3
Vehicle check	3
Tightening moments	4
Direct LiquiMax	5
Overview Direct LiquiMax	6
Direct LiquiMax parts / approval numbers	7
DLM component location overview	8
High pressure pump Supply	9
High pressure pump Return	10
Installation of the Bosch High Pressure Pump	11
Boost pump	12
Fuel Supply Unit / Fuel Return Unit	13
Mounting the FSU & FSU	14
Lpg / petrol fuel lines	15
Hose routing	16
Supply hose – Return hose – Tank wiring	17
Hose routing	18
Mounting the AFC - 1	19
Mounting the AFC – 2	20
Relay / Fuses location	21
Wiring routing	22
Wiring transit / Mounting the fuel selection switch / Petrol ECU location	23
Electrical connections	24
Electrical connections	25
Electrical connections	26
Electrical connections	27
Electrical connections	28
Checklist after installation	29

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



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.
- For an optimal functioning of the Direct LiquiMax system, maintain a clean and organized work environment during installation and maintenance to prevent pollution of the LPG components.
- 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.
- Wear safety goggles when working on petrol filled system / connections (pressurized petrol)
- Do not place the main fuse into the fuse holder before having completed the installation of the system.
- The AFC has to be activated by means of the Prins diagnosis software.
- Never disconnect the AFC connector, unless you have removed the main fuse.
- When installing the 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 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.
- 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 lpg leakage; use a lpg 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 lpg 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.

Register (warranty card) the system on the Prins warranty portal .



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 serial interface
- 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)
- Socket 46mm
- 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 analyzer)
- Check the condition of the ignition system (spark plugs, cables, coil)



Tightening moments

	Nm	SW
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
(filtered)Banjo bolt	10	14
Supply line connection	15	13
Fuel module Allen bolts	20	7
Filler hose connection	50	22

EXPLANATION OF SYMBOLS :



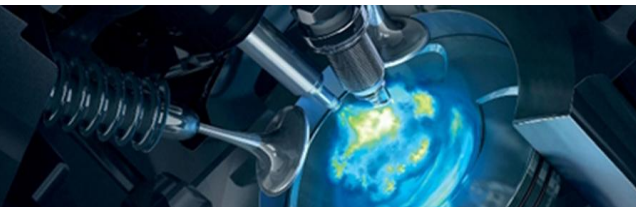
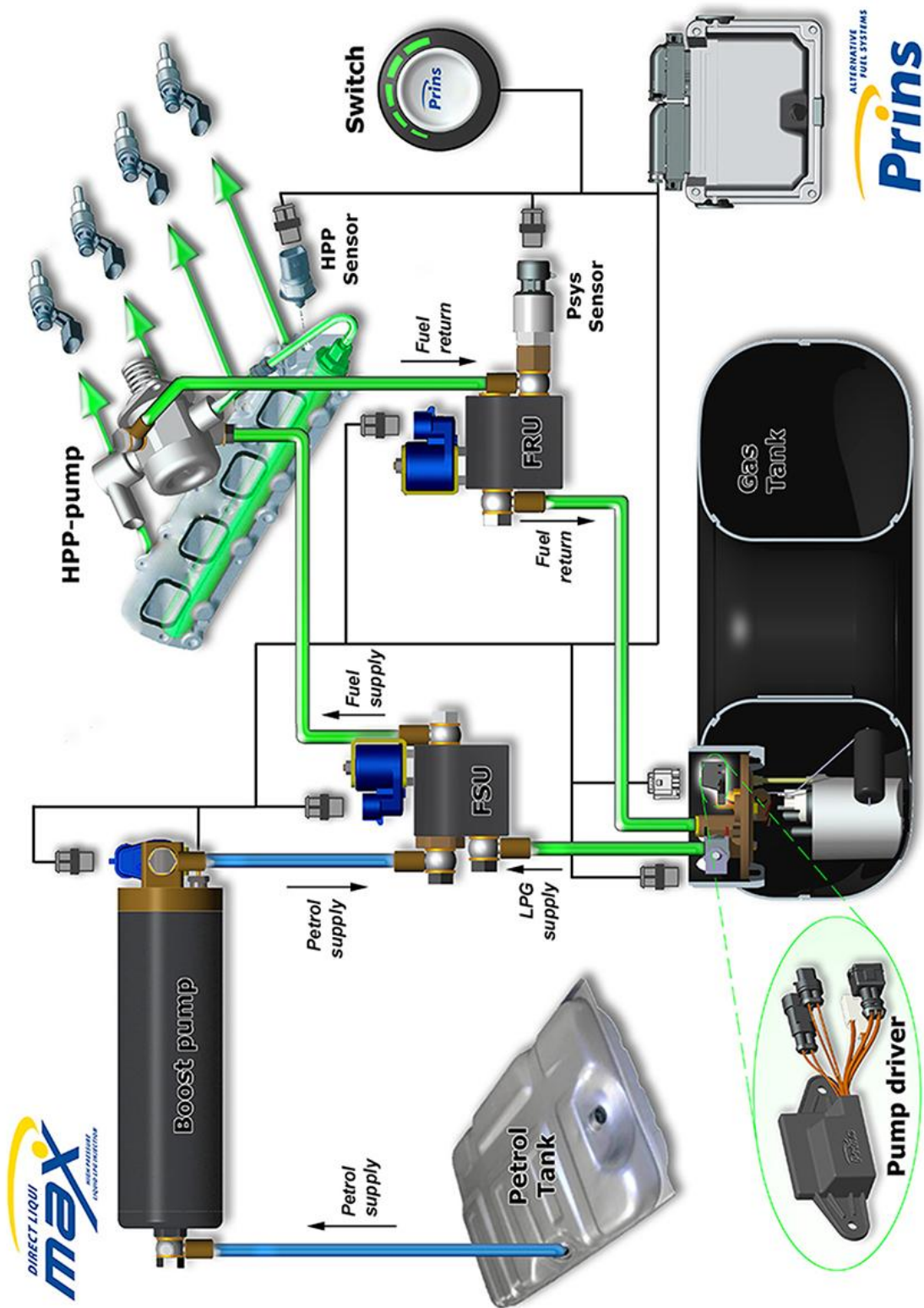
= IMPORTANT,
CAUTION



= WEAR SAFETY GOGGLES

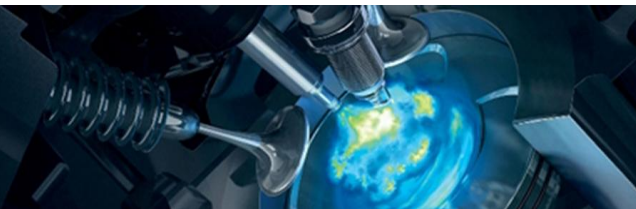
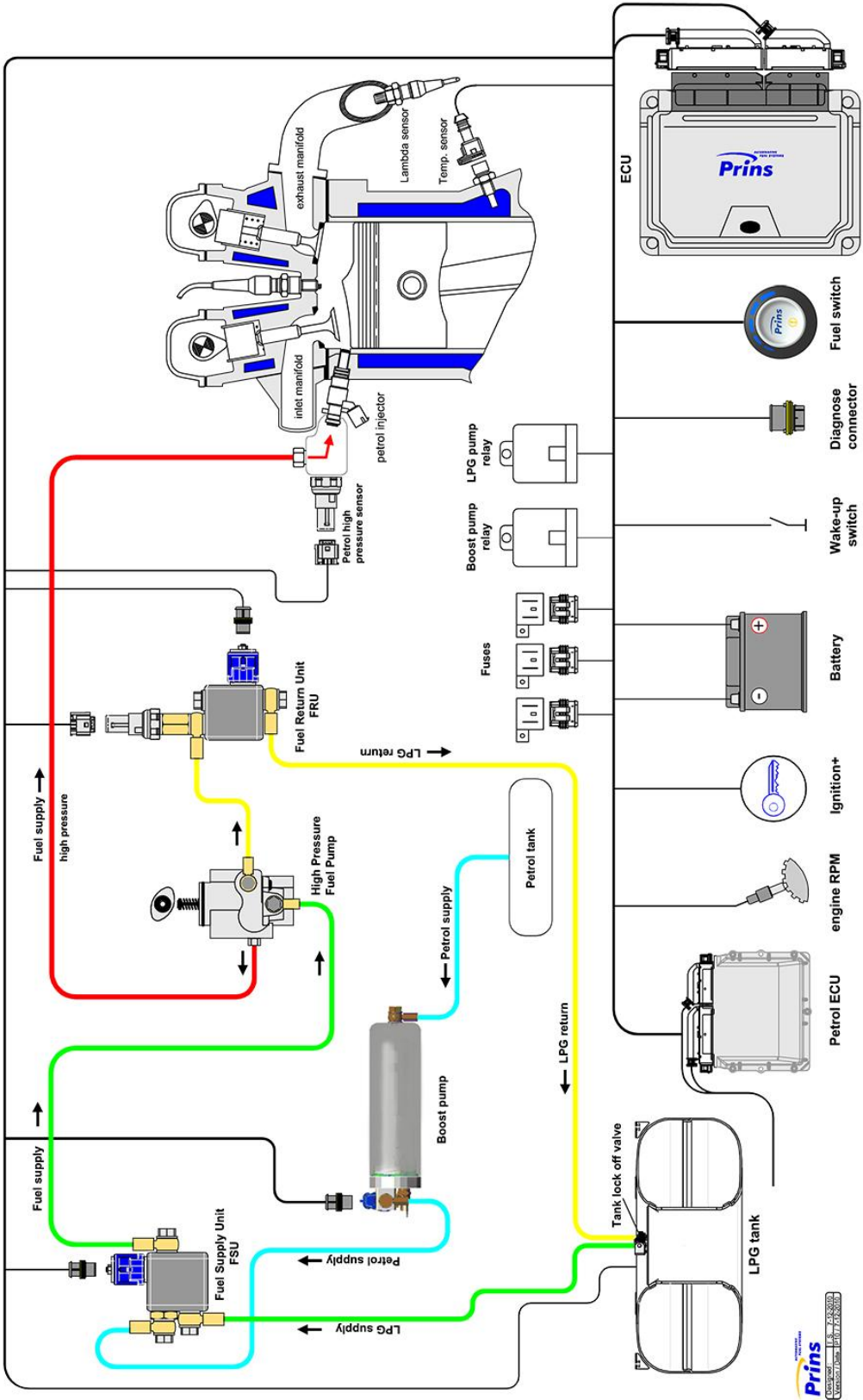


Direct LiquiMax



Overview Direct LiquiMax

overview Direct Liqui Max

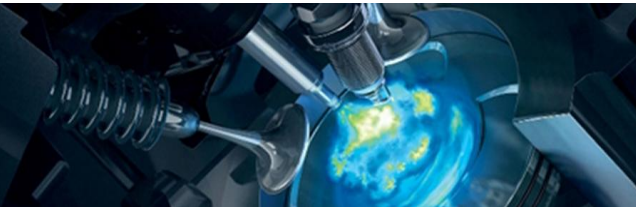
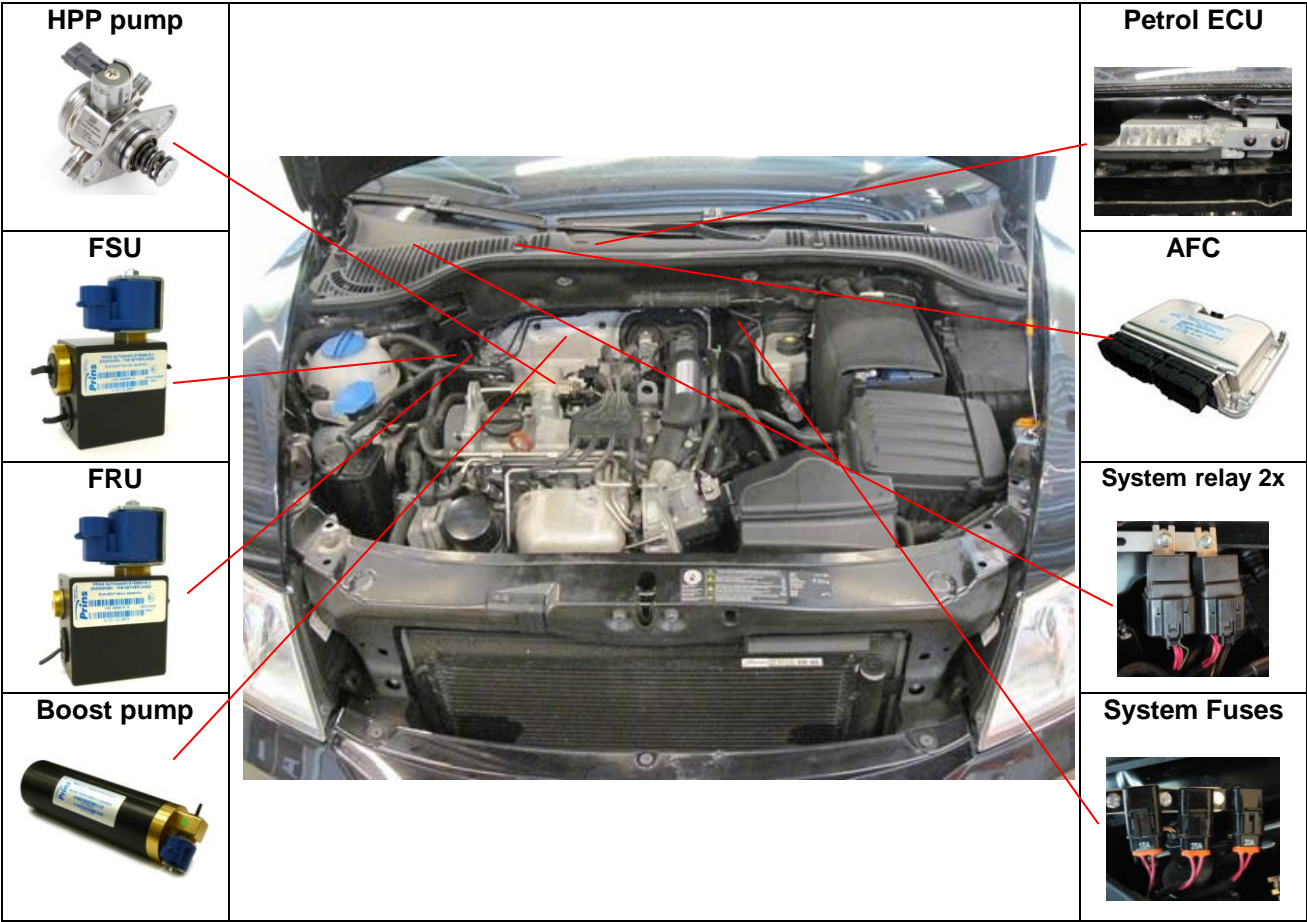


Direct LiquiMax parts / approval numbers

 <p>1st generation</p>  <p>2nd generation</p>	 <p>1st generation</p>  <p>2nd generation</p>
<p>Fuel Supply Unit : E4-67R-010269</p>	<p>Fuel Return Unit : E4-67R-010270 Pressure Sensor : E4-67R-010051</p>
	
<p>Boost pump</p>	<p>High Pressure Pump : E4-67R-010266 High Pressure Rail : E4-67R-010267 High Pressure Injectors : E4-67R-010309</p>
	 <p>XD-3 LPG</p>  <p>XD-4 LPG</p>
<p>Prins ECU : E4-67R-010098 E4-10R-030507</p>	<p>Fuel lines series XD : E4-67R-010247 XD3 E4-67R-010247 XD4</p>



DLM component location overview



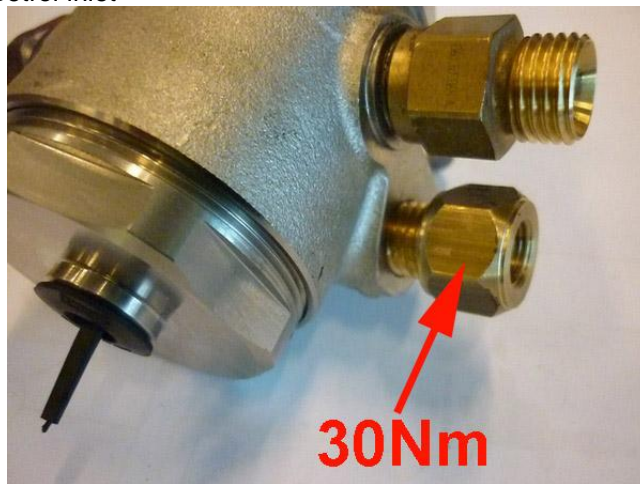
High pressure pump Supply



Remove the High petrol pressure pump. Careful : petrol !
(Follow the workshop manual of the car)



Remove petrol inlet



High pressure pump Return

Replace the high pressure pump cover (46mm) for the adapted high pressure pump. Careful : petrol !
Carefully cut the cover, remove shockers and install them into the new cover.



Tighten cover with 220 Nm, do not forget the sealing ring between pump and pump cover.

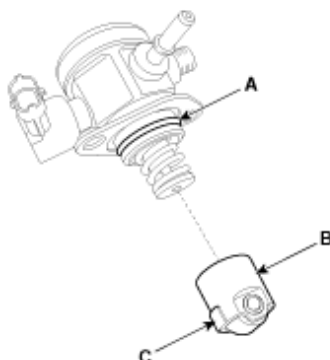


Installation of the Bosch High Pressure Pump

INSTALLATION

Before installing the high pressure fuel pump, position the roller tappet (**B&C**) in the lowest position by rotating the crankshaft. Otherwise the installation bolts may be broken because of tension of the pump spring.

Apply engine oil to the O-ring (**A**) of the high pressure fuel pump, the roller tappet (**B**), and the protrusion (**C**). (roller tappet, only if removed from cylinder head)
Also apply engine oil to the groove on the location where the protrusion (**C**) is installed.



Installation bolts:

When tightening the installation bolts of the high pressure fuel pump, tighten and turn the bolts in small step (0.5 turns) after tightening them with hand-screwed torque.

High pressure fuel pump installation bolt: 12.8 ~ 14.7 N.m

Fuel pipe:

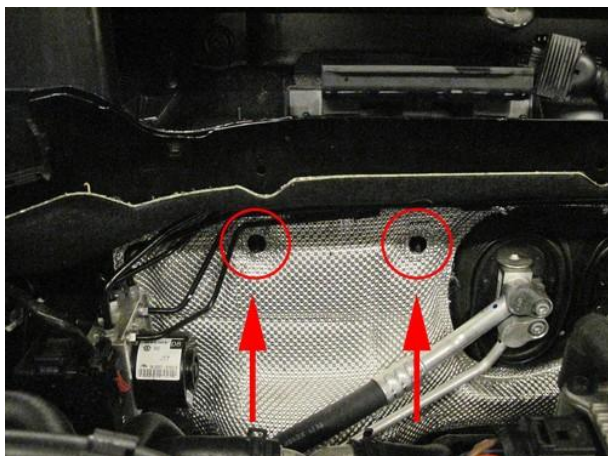
First hand-tighten the nut(s) fully until they are not fastened any more in order to have them inserted in place and then completely tighten to the specified torque using a torque wrench.
If not tightening the bolts or nuts in a straight line with the mating bolt holes or fittings, it may cause a fuel leak due to broken threads.

High pressure fuel pipe installation nut: 26.5 ~ 32.4 N.m

Installation is reverse of removal.



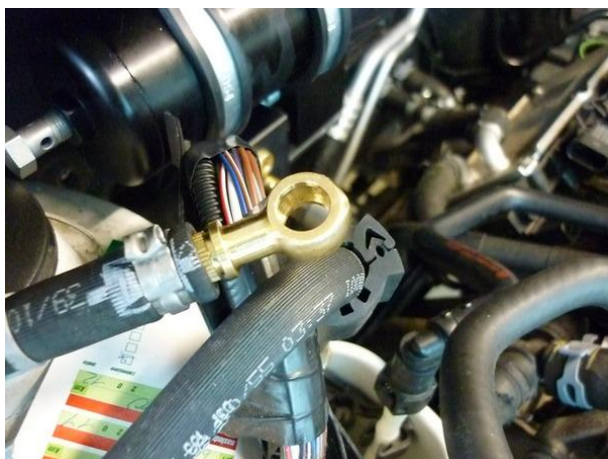
Boost pump



Mount bracket with boost pump clamp to original threaded ends.



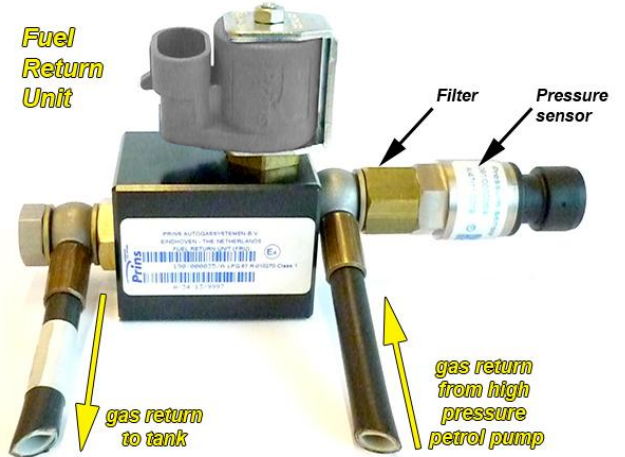
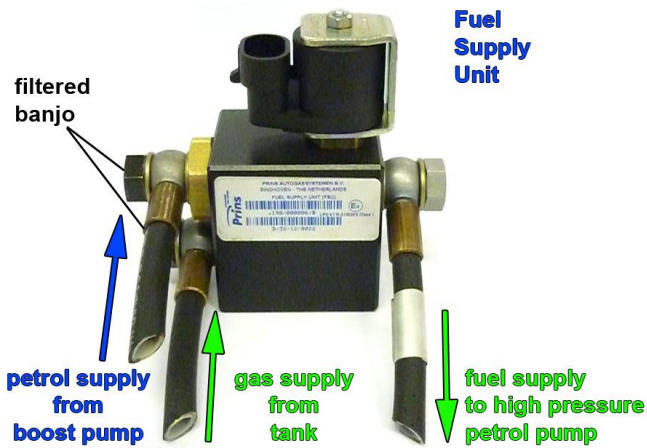
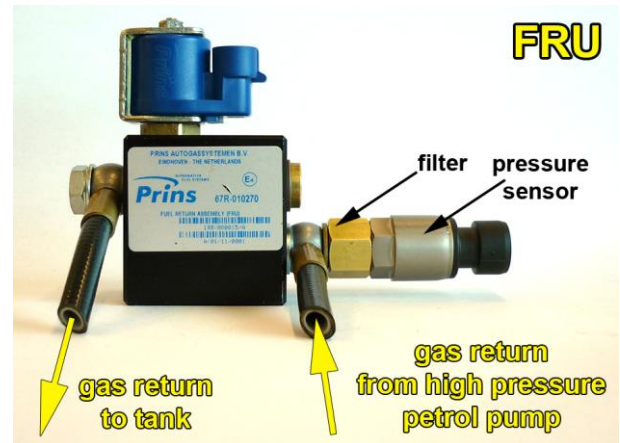
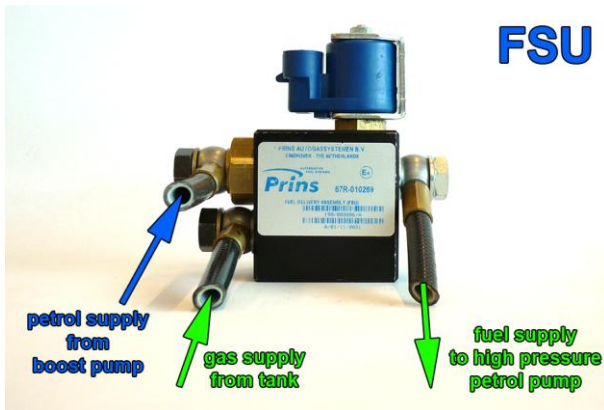
Mount boost pump with rubber ring to bracket/clamp.



Connect the fuel hose with the XD-5 banjo eye to the inlet of the boost pump.



Fuel Supply Unit / Fuel Return Unit



Black filtered banjo will only be used on inlet connections !

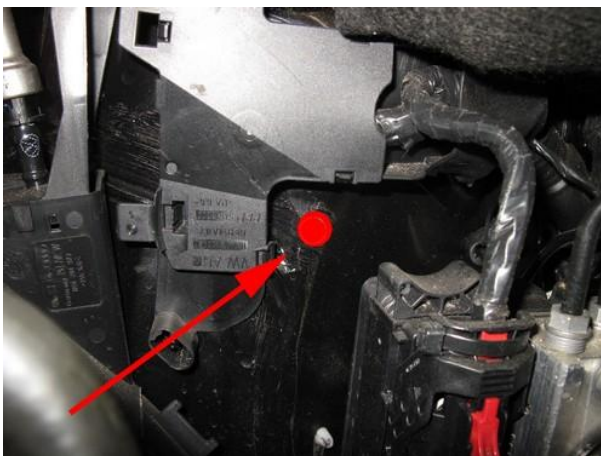
Filter inside sensor banjo



Mounting the FSU & FSU



Mount the FSU and FRU on the bracket.



Hold bracket with FSU & FRU in place and mark hole to drill. Drill hole $\varnothing 11\text{mm}$ and protect against corrosion.

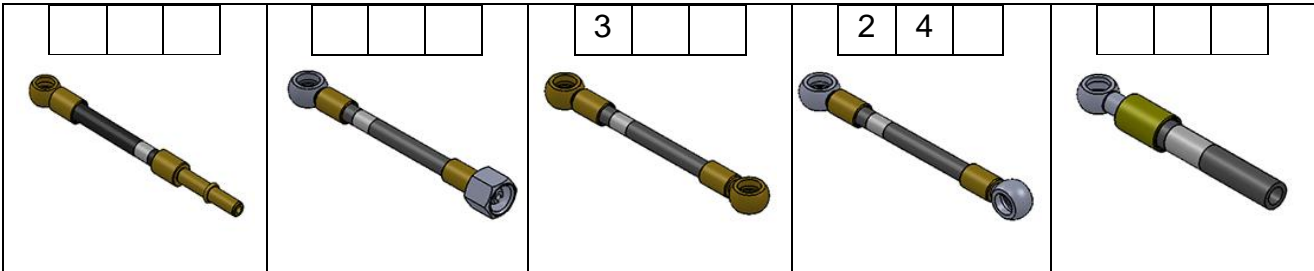


Mount bracket with units with M10 bolt, nuts and (spring) washers.

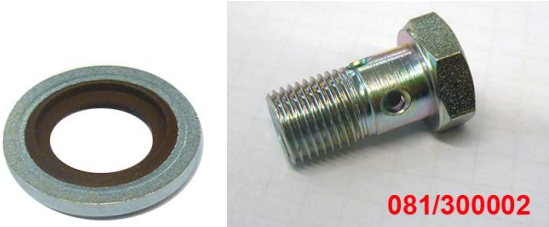


Lpg / petrol fuel lines

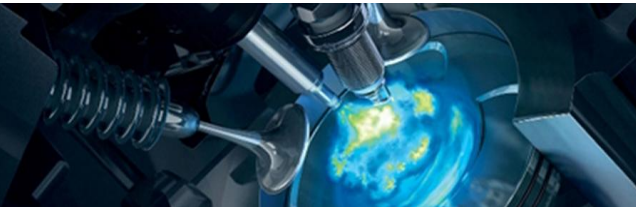
Hose	from	to	Length (cm)
1 Original	Original petrol hose	Petrol boost pump	Banjo Eye for XD-5
2 XD-3	Petrol boost pump	Fuel supply unit	40
3 XD-3	Fuel supply unit	High pressure petrol pump	40
4 XD-3	High pressure petrol pump	Fuel return unit	35
5 XD-	Fuel return unit	High pressure petrol rail	n.a.



Install the fuel line using two bonded seal washers and banjo bolt :



Filtered banjo: (FSU supply inlets / boost pump inlet : black filtered banjo) :



Hose routing

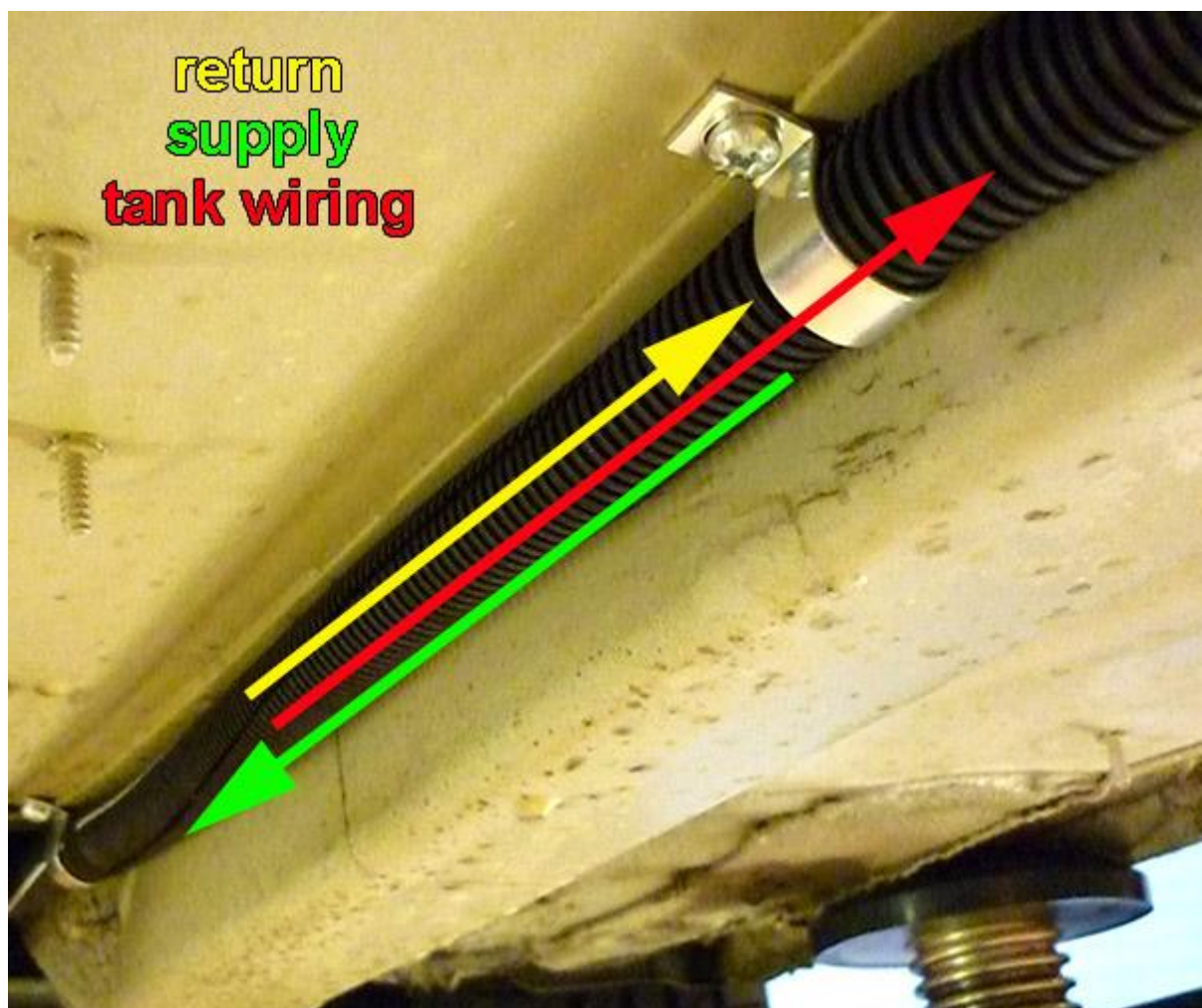


Re-use clip that you previously removed.

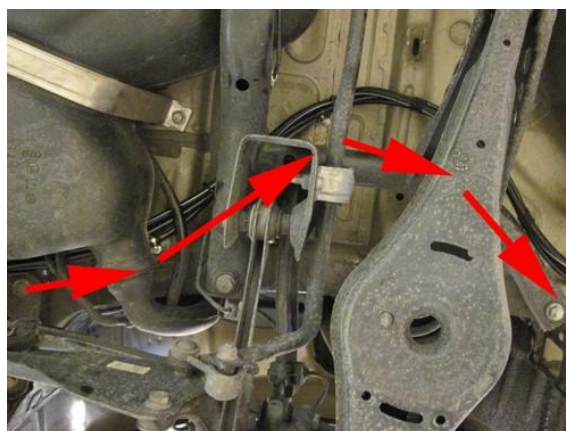
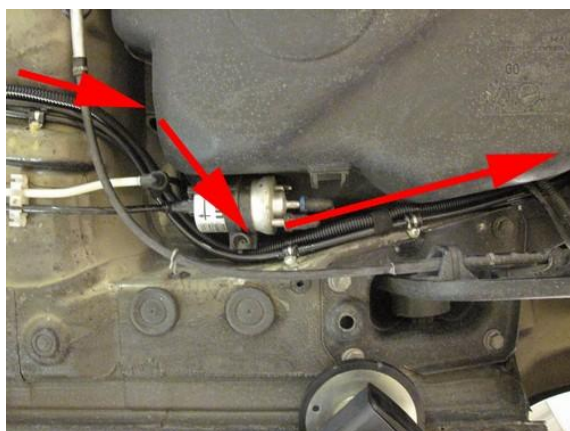


Supply hose – Return hose – Tank wiring

Protect the supply- and return hose together with tank-wiring using the Ø16 split tube.
Mount the “hose assembly “ with clamps, with a maximum distance of 40cm.



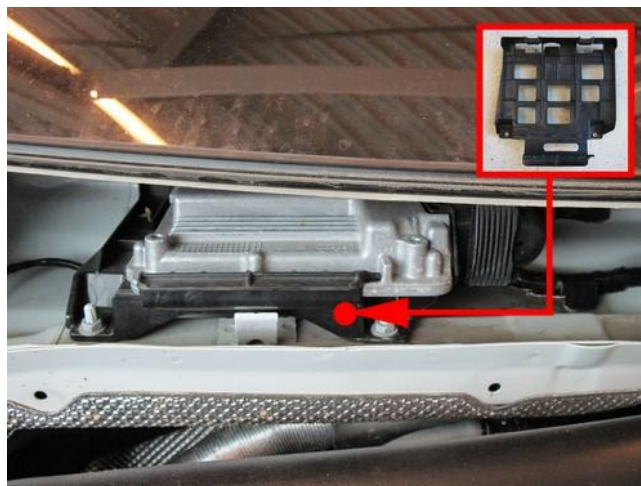
Hose routing



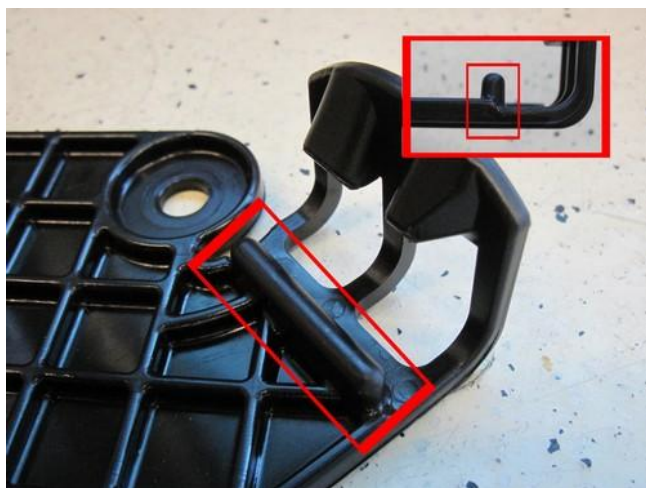
Mounting the AFC - 1



Remove wipers, wiper box and wiper motor.



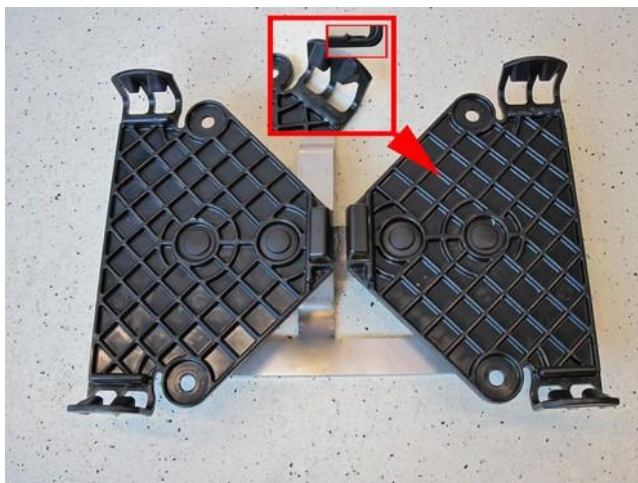
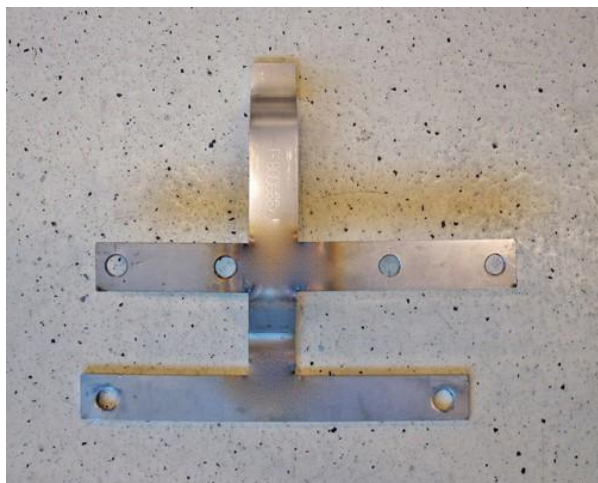
Remove petrol ECU en remove petrol ECU bracket.



From 1 of the 2 AFC clips, remove both ribs as shown on picture.



Mounting the AFC – 2



Mount 2 AFC clips on the brackets with the quick clips. Mount the adapted AFC clip on the right side.



Mount the AFC & petrol ECU on the bracket.



(Example out of car)



Relay / Fuses location



On right side to plastic cover in wiper box.



Mount fuse holders to bracket



Mounting point fuse bracket. Mount bracket.



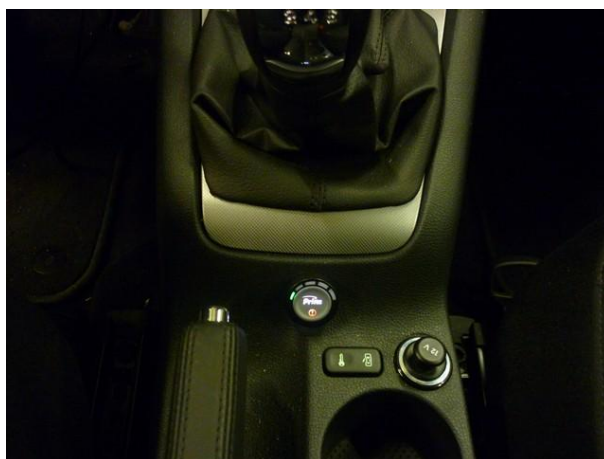
Wiring routing



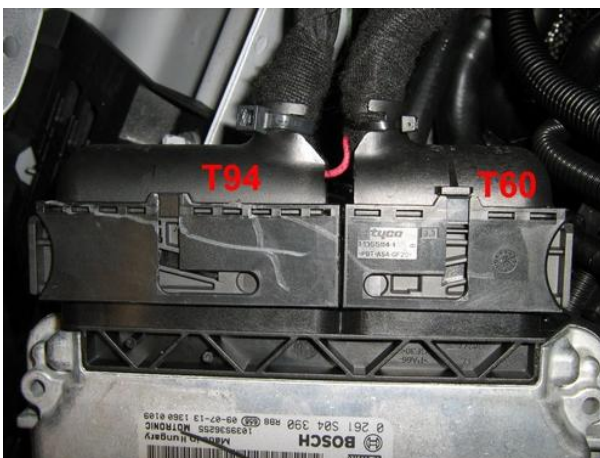
Wiring transit / Mounting the fuel selection switch / Petrol ECU location



Remove cover behind wiper motor. Drill hole Ø20mm in cover and mount grommet. Remount cover.
After you have installed the wiring, use a silicon sealant around the wiring for a waterproof transit.



Mounting the fuel switch




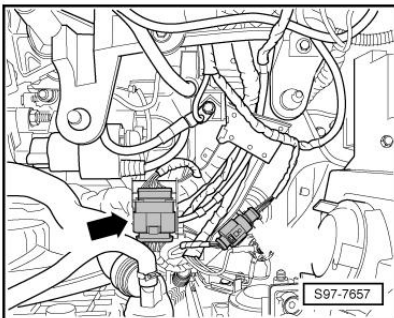
Petrol ecu in plenum chamber / wiper box.



Electrical connections

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

Engine room

1-32 MAIN GND ecu MAIN GROUND SENSE MAIN GND pump driver MAIN GND boost pump	brown	Connect to the '-' of the battery (-31) ; use a ring terminal. Wire location :Left-side on the shock damper original point. LPG wiring Main ground 3x M8 eyes colour brown
4 – 13 – 44 +12V BATT sense +12V BATT fused +12V BATT boost pump +12V BATT pump driver	red	Connect to the '+' of the battery (+30) ; use a ring terminal. Do not place the fuse in the holder before having completed the installation of the lpg system. Wire location : On top of battery . Color: red 
121 Wake-up	Red-grey	Wire colour: Black Wire location: left side, underneath air filter box, 14p connector, pin 1 



Electrical connections

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

<i>Wire number / code</i>	<i>Wire colour</i>	<i>Connection</i>
23 Digital Simulation	Green-red	insulate
115 Digital input 4	Yellow-red	insulate
119 Digital input 2	Yellow-grey	insulate
10 Simulation 2	Green-black	insulate
6 Lambda1 WB	Orange	insulate
42 Lambda2 WB 10KΩ	Orange-white	insulate



Electrical connections

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

Wire number / code	Wire colour	Connection
18 Analog 1 25 Simulation 1	Blue-red Green-grey	<i>High pressure sensor petrol interruption</i> Sensor side. ECU side. Wire colour : grey-blue Wire location : petrol ecu, connector T60, pin 40
19 Analog 4	Blue-white	<i>High pressure sensor petrol ground offset</i> Wire colour : brown-blue Wire location : petrol ecu, connector T60, pin 13
117 Digital input 3	Yellow-black	<i>High pressure sensor petrol supply 5V</i> Wire colour : red-blue Wire location : petrol ecu, connector T60, pin 29
7 +12V IGNITION	grey - white	<i>Make a connection to ignition + / contact + (+15).</i> 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, connector T94, pin 87
17 Analog 2	Blue-black	<i>Intake air temperature</i> Wire colour : yellow Wire location : petrol ecu, connector T60, pin 42
27 +5V sensor 37 C ground 20 Analog 3 MAP*	Red Brown Blue	For measuring the inlet manifold pressure (MAP).
* When original sensor is used: cut off connector: <u>Only</u> use blue signal wire 20	Red:insulate Brown:insulate Blue	For measuring the inlet manifold pressure from the engine MAP sensor. Wire colour : purple-white Wire location : petrol ecu, connector T60, pin 55
8 RPM	Purple-white	For measuring the engine speed signal. Wire colour: black Wire location : petrol ecu, connector T60, pin 53
15 T-ect	Grey	For measuring the engine coolant temperature. Wire colour : brown Wire location : petrol ecu, connector T60, pin 57



Electrical connections

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

Engine room

Wire number / code	Wire colour	Connection
<i>3-pole connector</i>		Connect the 3-pole connector to the Psys sensor positioned into the Fuel Return Unit.
35 C Ground pin A	Brown	Sensor wire pin A
9 +5V sensor pin B	Red	Sensor wire pin B
16 Psys pin C	Green	Sensor wire pin C
14 T-LPG	Grey	Not used, insulate.
<i>2-pole connector Boost Pump</i>	Red	Connect the 2-pole connector to the lock-off valve of the Boost Pump.
106 + Lock-off Boost Pump	White-yellow	
98 Ground lock-off		
<i>2-pole connector FSU</i>	Red	Connect the 2-pole connector to the lock-off valve of the Fuel Supply Unit
108 + Lock-off FSU	Pink-yellow	
100 Ground lock off		
<i>2-pole connector FRU</i>	Red	Connect the 2-pole connector to the lock-off valve of the Fuel Return Unit
90 + Lock-off FRU	Blue-yellow	
82 Ground lock off		
<i>4-pole diagnose connector</i>		Diagnose connector for service / diagnosis
46 Service TxD	Grey	Connector pin 1
65 Service RxD	Grey	Connector pin 2
68 C ground	Brown	Connector pin 4
<i>Boost pump relay</i>		
107 + relay boost pump	Red	Pin 86 of the boost pump relay
99 GND relay boost pump	Green-yellow	Pin 85 of the boost pump relay
+12V fused BATT	Red	Pin 30 of the boost pump relay
+12V Boost pump	Red	Pin 87 of the boost pump relay

Driver room

<i>3-pole micro connector</i>		
66 Ground fuel switch	Brown	Connect the 3-pole connector to the Prins fuel selection switch.
3 +12V fuel switch	Red	
49 LIN fuel switch	yellow	
51 CAN-High	Blue-yellow	EOBD connector pin 6
70 CAN-Low	Blue	EOBD connector pin 14

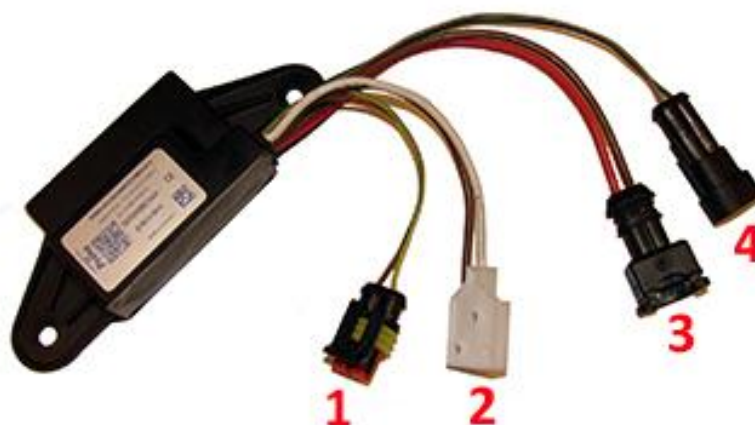


Electrical connections

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

Lpg tank housing

Wire number / code	Wire colour	Connection
3-pole tank level connector 40 Ground tank gauge 12 Tank level in 11 + tank level supply	Brown Blue Red	Connect the 3-pole connector to the tank level sensor.
1. 2-pole connector tank lock-off	Green-yellow Brown	From tank pump driver From tank pump driver
2. 3-pole connector tank pump	Red 2.5mm ² Brown 2.5mm ²	From tank pump driver From tank pump driver
3. 2-pole connector driver	Red 2.5mm ² Brown 2.5mm ²	From tank pump relay 87 From main ground
4. 2-pole connector driver	Green Grey	From AFC pin 22 pwm From AFC pin 64 diagnose



Checklist after installation

1. Install the system fuses.
Turn on ignition.
Connect the Prins interface wire and run the Prins diagnosis program.
When working on the car, beware of moving and rotating parts in the engine compartment (even when the engine is not running !!).
2. When commissioning the LPG system, you must activate the AFC with the diagnosis software.
3. Check whether the program in the AFC matches with the car (dedicated engine set):
See "Identification" in the diagnosis program.
4. Check all components and connections for any LPG leakage, use a LPG leak detector device or a fluid detection like soap. Also check for petrol leakage. Make sure the solenoid valves are in open position.
No evidence of leakage is permitted.
Caution for moving and rotating parts in the engine compartment !
5. Use the diagnosis software to check again all input and output signals.
6. Check the system for error codes and solve these, if required.
Check the petrol MMS for EOBD error codes.
Place the protection connector back on the diagnose connector.
7. Make a test drive and check the cars drivability on LPG and petrol.

