ALTERNATIVE FUEL SYSTEMS

Prins

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

Installation manual
Dedicated
PART 2/2

MANUFACTURER	Seat
TYPE	Leon
ENGINE DISPLACEMENT	2000cc
NUMBER OF VALVES	16v
ENGINE CODE / NUMBER	CCZB
VEHICLE CATEGORIES	M
TRANSMISSION	MT
VERSION	Direct LiquiMax-2.0
PETROL ECU MANUFACTURER / CODE	Bosch MED 17.5
HIGH PRESSURE PETROL POMP	Hitachi 06J 127 025 E
HIGH PRESSURE PETROL INJECTOR	-
MODEL YEAR:	2010
SYSTEM APPROVAL NUMBER (R115)	E4-115R-000010 / DLM-LPG 03
LOCATION SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	361/070001/A
MANUAL NUMBER	076/2101100
DATE :	2014-04-03

Version 2012-05-21 D

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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 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.
- 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 (10Nm)
- 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

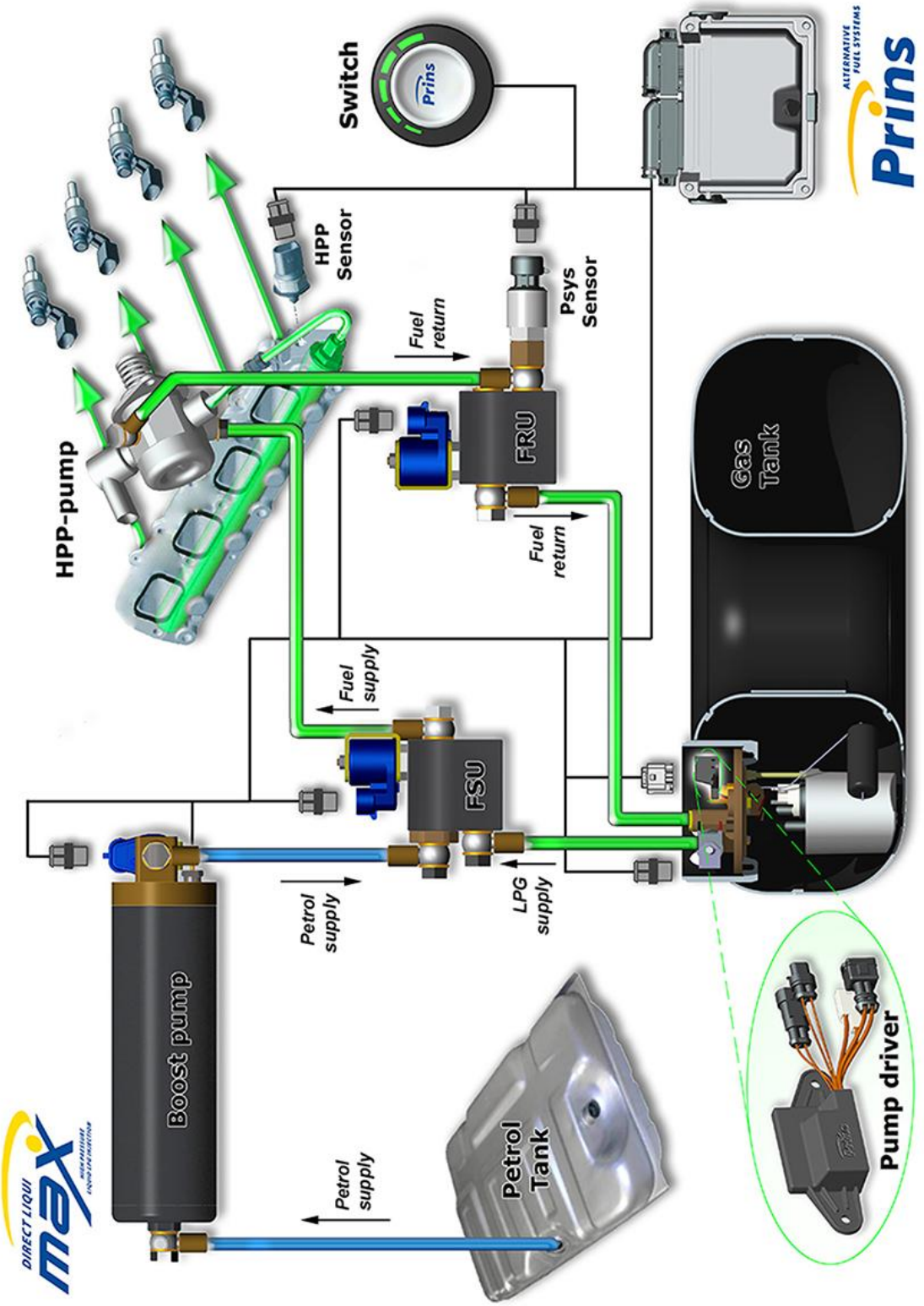
		Nm	SW
M 4 x 0,7		3.3	7
M 5 x 0,8		6.5	8
M 6 x 1,0		11.3	10
M 7 x 1,0		14.5	11
M 8 x 1		24.5	13
M 8 x 1,25		27.3	13
M 10 x 1		52	15-16-17
M 10 x 1,5		54	15-16-17
(filtered)Banjo bolt		10	14
Supply line connection		15	13
Fuel module Allen bolts		20	7
Filler hose connection		50	22
HPP cover		220	46

EXPLANATION OF SYMBOLS :

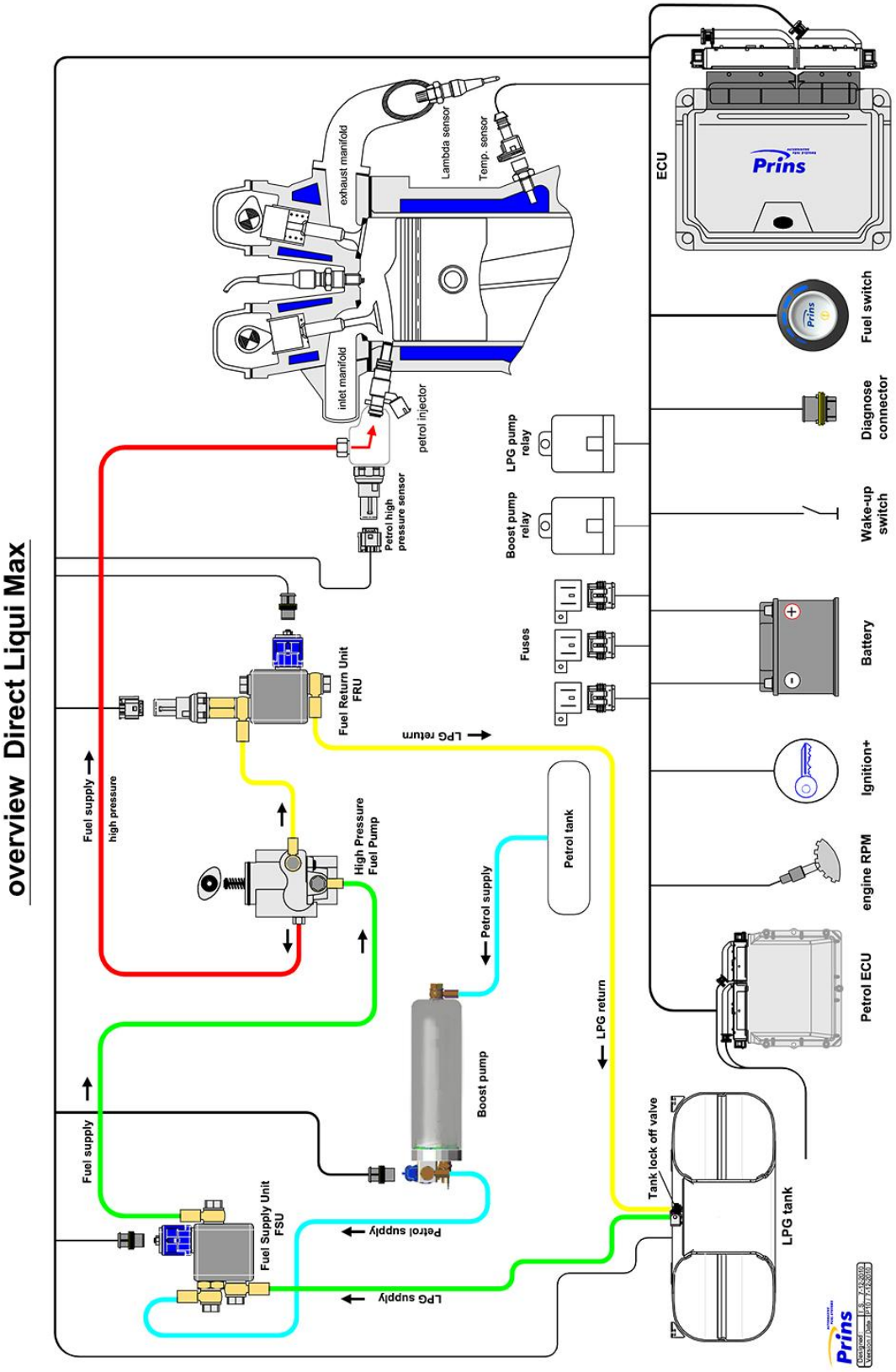
= IMPORTANT, CAUTION

= WEAR SAFETY GOGGLES

Direct LiquiMax



Overview Direct LiquiMax



Direct LiquiMax parts / approval numbers

<table>
<tr>
<td> 

1st generation
 

2nd generation</td>
<td> 

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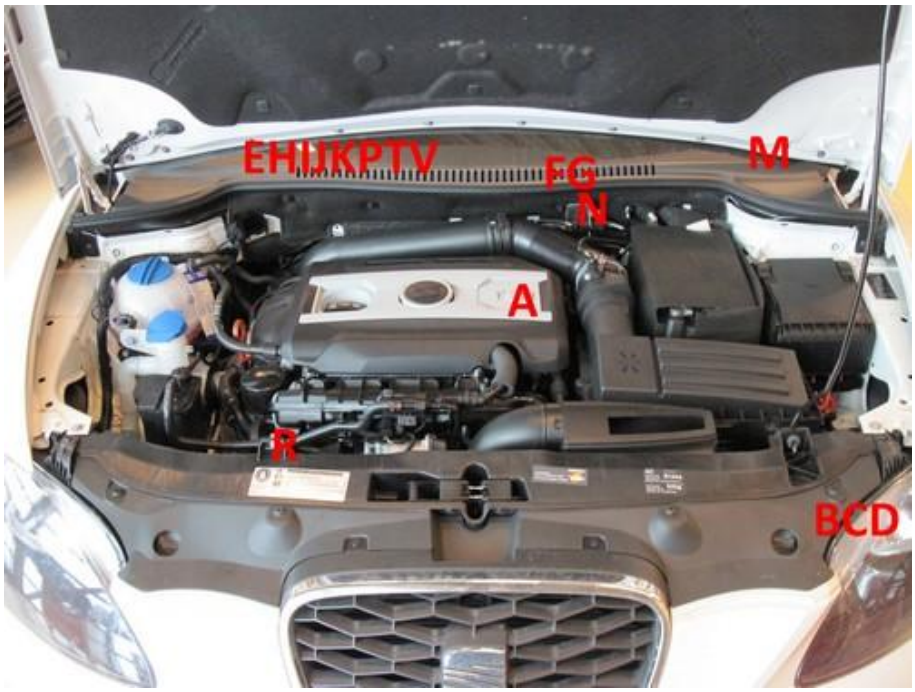
Mounting and connection points

For easy mounting remove battery and air filter box

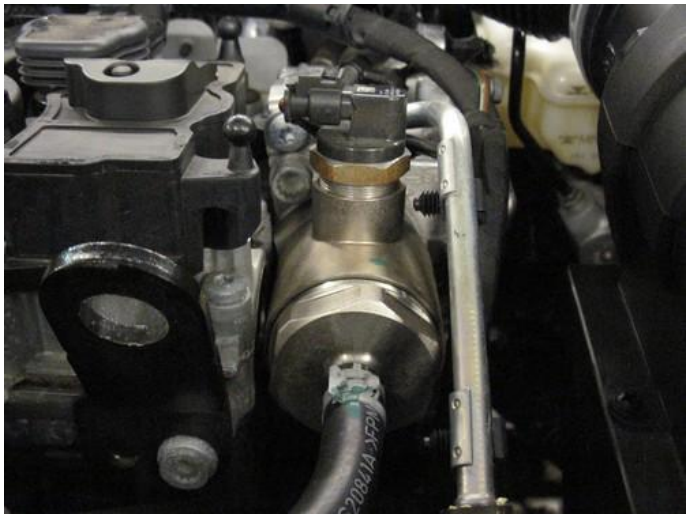


A	: High pressure petrol pump	L	: R115 Approval sticker
B	: Fuel Supply Unit : FSU	M	: Grommet
C	: Fuel Return Unit : FRU	N	: Gas system fuses
D	: Boost pump	P	: T-ect
E	: AFC	Q	: Low pressure signal
F	: Boost pump relay	R	: MAP, Analog 3
G	: Tank relay	S	: Analog 2
H	: Petrol ECU	T	: Analog 4
I	: Engine speed signal RPM	V	: Digital input 3
J	: “+” ignition	W	: Wake-Up
K	: High pressure signal Analog 1	X	: Digital input

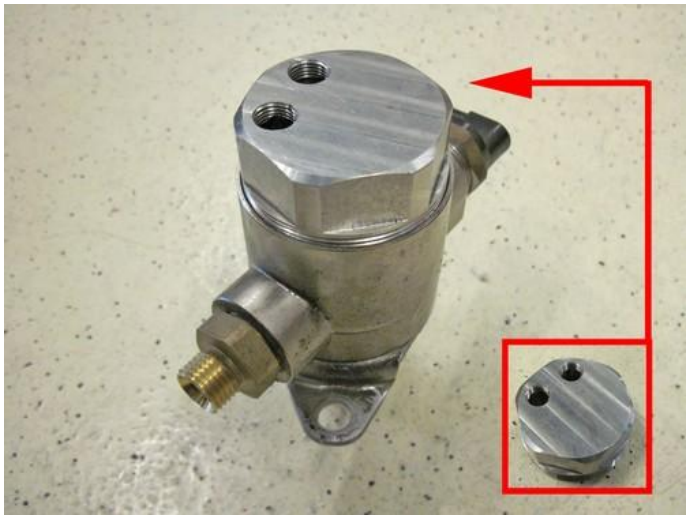
L:
R115 approval sticker :
Right side centre door post

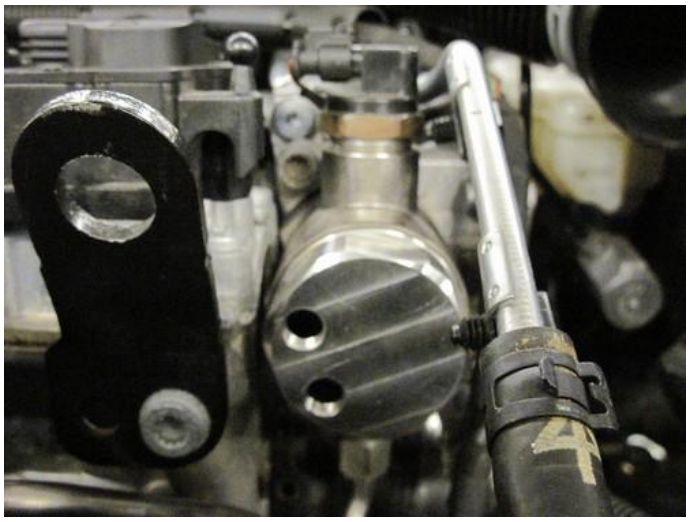
High pressure pump installation

Replace the cover from the high pressure pump for the adapted high pressure pump cover.
(Follow the workshop manual of the car)



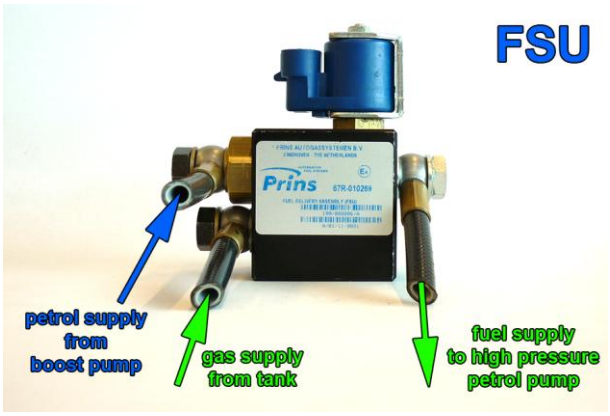
Remove HP pump from engine. Remove HPP cover.

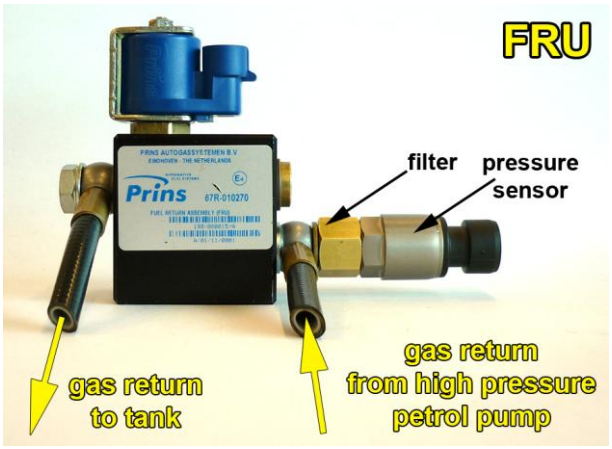


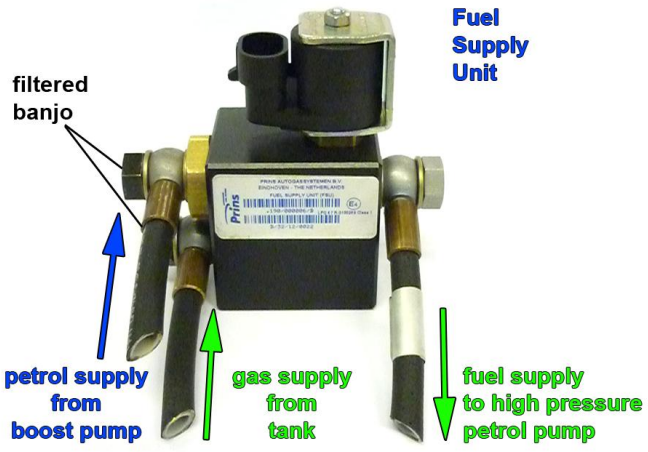


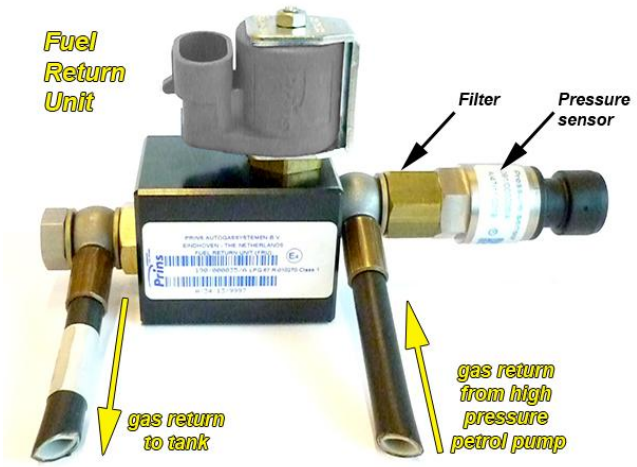
Mount new HPP cover. Remount HP pump to engine.

Fuel Supply Unit / Fuel Return Unit







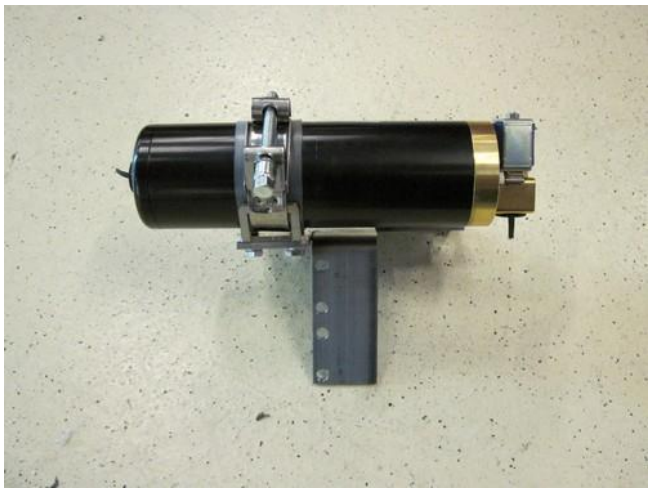


Black filtered banjo will only be used on inlet connections !

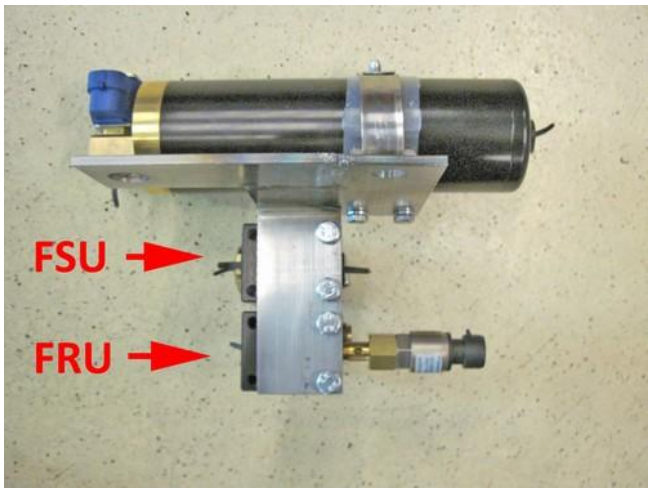
Filter inside sensor banjo

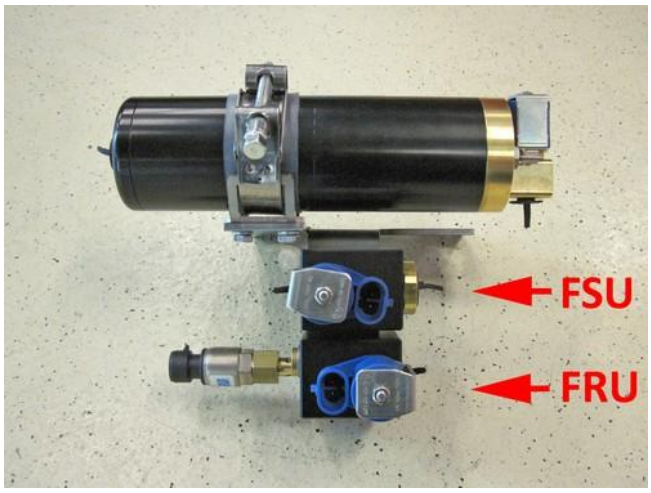
Boost pump / FSU / FRU - 1


Mount boost pump clamp on bracket.

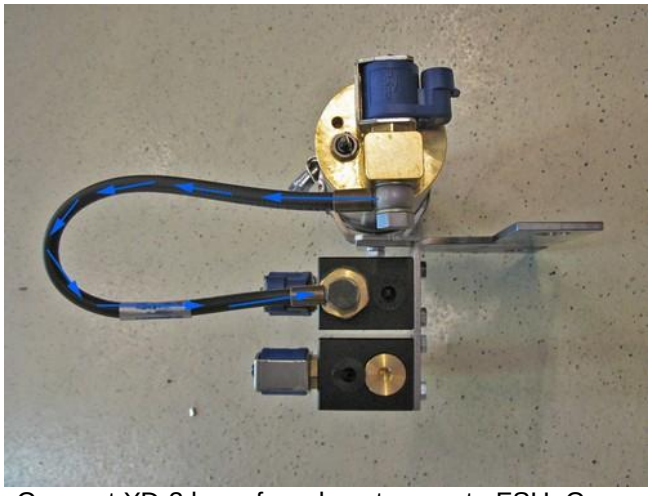
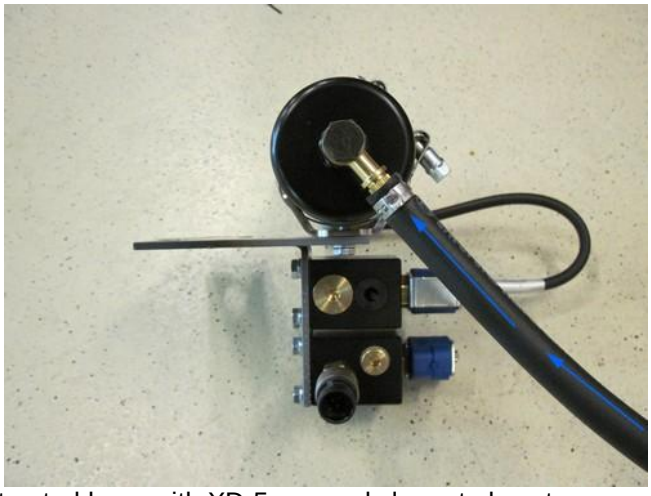
Put boost pump ring on boost pump. Mount boost pump in boost pump clamp (do not tighten clamp).



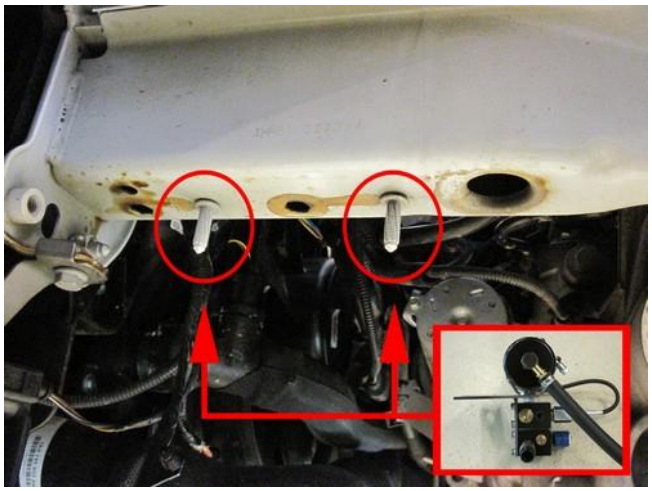
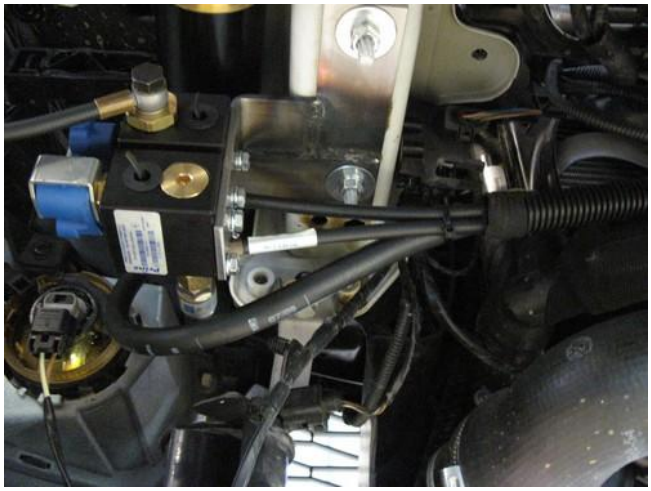


Mount FSU & FRU to bracket

Boost pump / FSU / FRU – 2

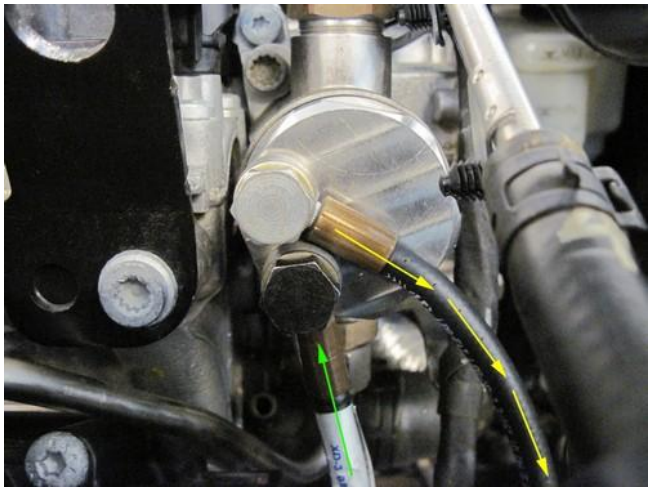
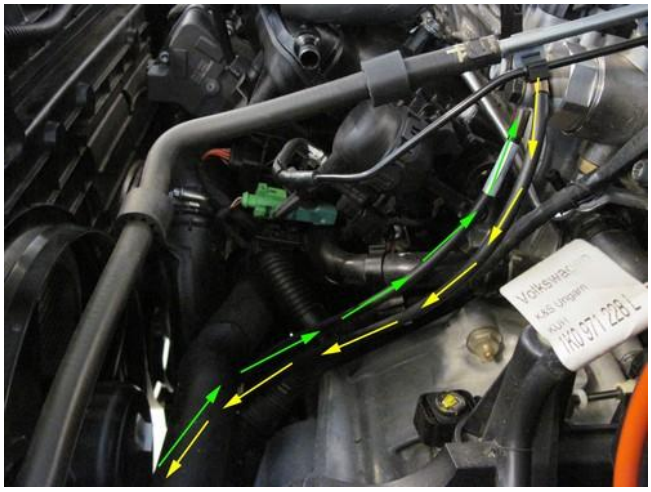



Connect XD-3 hose from boost pump to FSU. Connect petrol hose with XD-5 eye and clamp to boost pump.

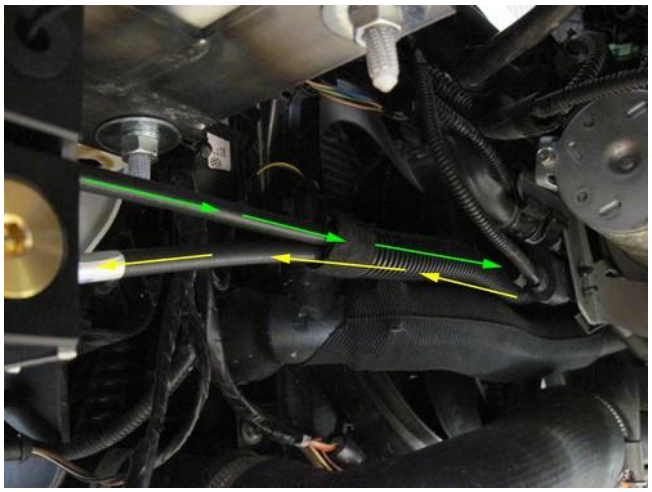
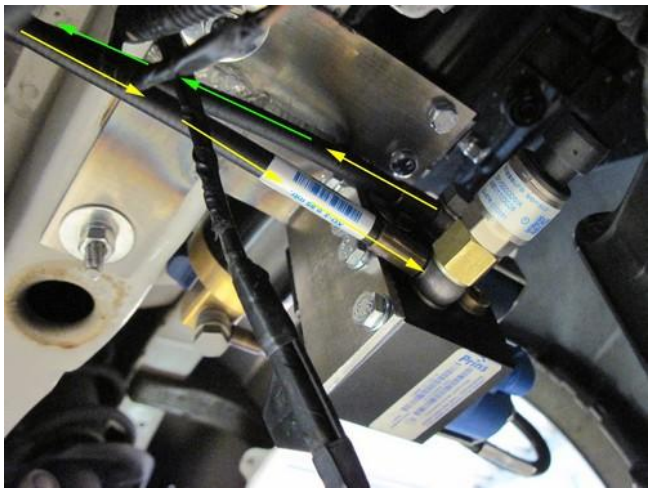



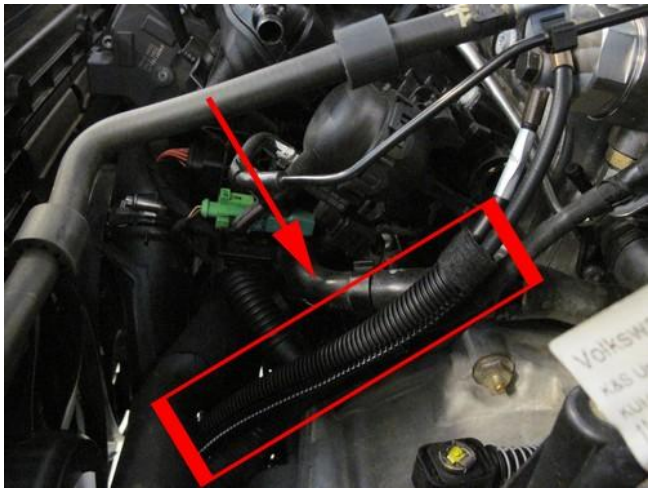
Mount bracket with boost pump, FSU & FRU to front left chassis beam with M8 nuts, big washers and spring washers.

Connection of the fuel hoses - 1

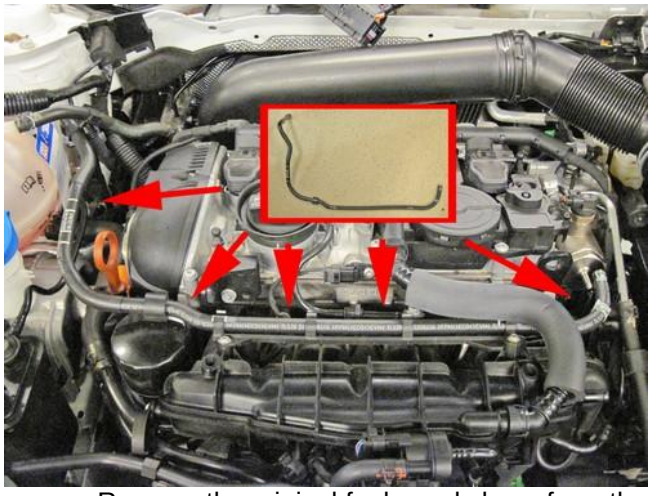
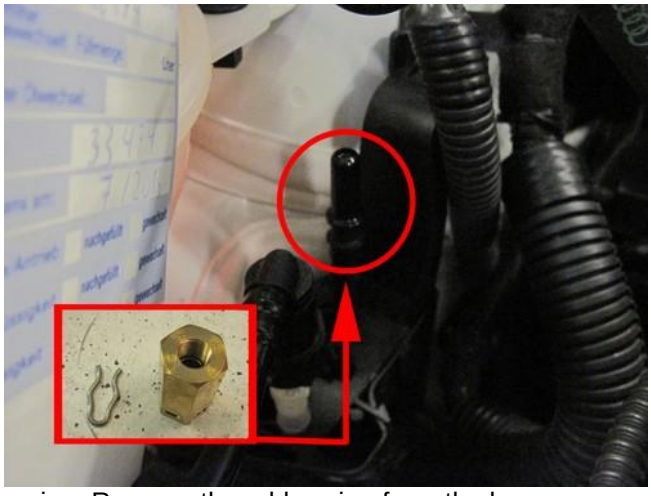
Connect the XD-3 hose from FSU to HPP & connect the XD-3 hose from HPP to FRU.

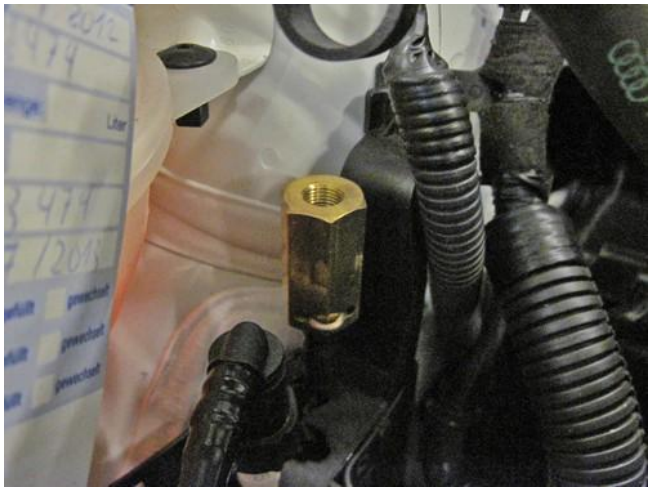


After connecting the hoses, mount protection tube around the 2 hoses.

Connection of the fuel hoses - 2

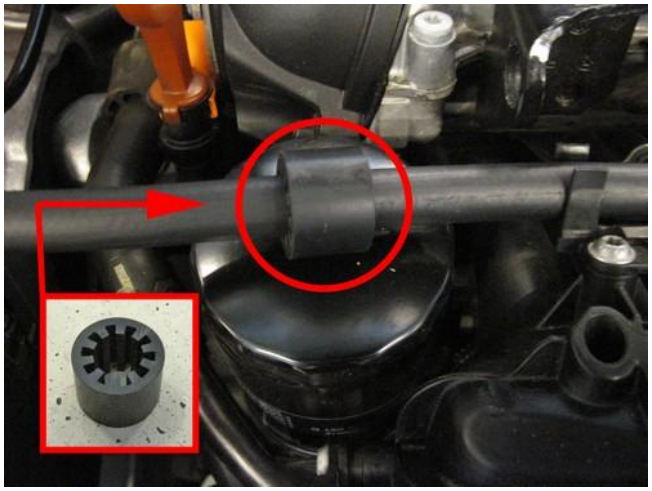
Remove the original fuel supply hose from the engine. Remove the rubber ring from the hose.
Mount the Fuel Quick Connector with clip to the original fuel lining.



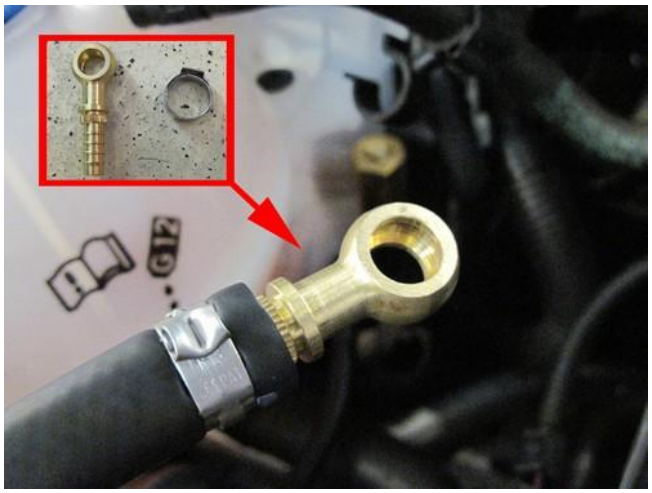

Follow the routing of the FSU/FRU hoses to the HP pump.


Follow the routing of the FSU/FRU hoses to the HP pump. Then use the original fuel hose routing.

Connection of the fuel hoses – 3




Mount just removed rubber ring to 8mm fuel hose. Cut hose on length.




Mount XD-5 eye with clamp to fuel hose. Mount 8mm fuel hose with banjo bolt to Fuel Quick Connector.

LPG / Petrol fuel lines

Hose	from	to	Length (cm)
8mm hose	Adapter original petrol hose	Petrol boost pump	200
XD-3	Fuel supply unit	High pressure petrol pump	85
XD-3	Petrol boost pump	Fuel supply unit	30
XD-3	High pressure petrol pump	Fuel return unit	85
-----	Fuel return unit	High pressure petrol rail	N.A.

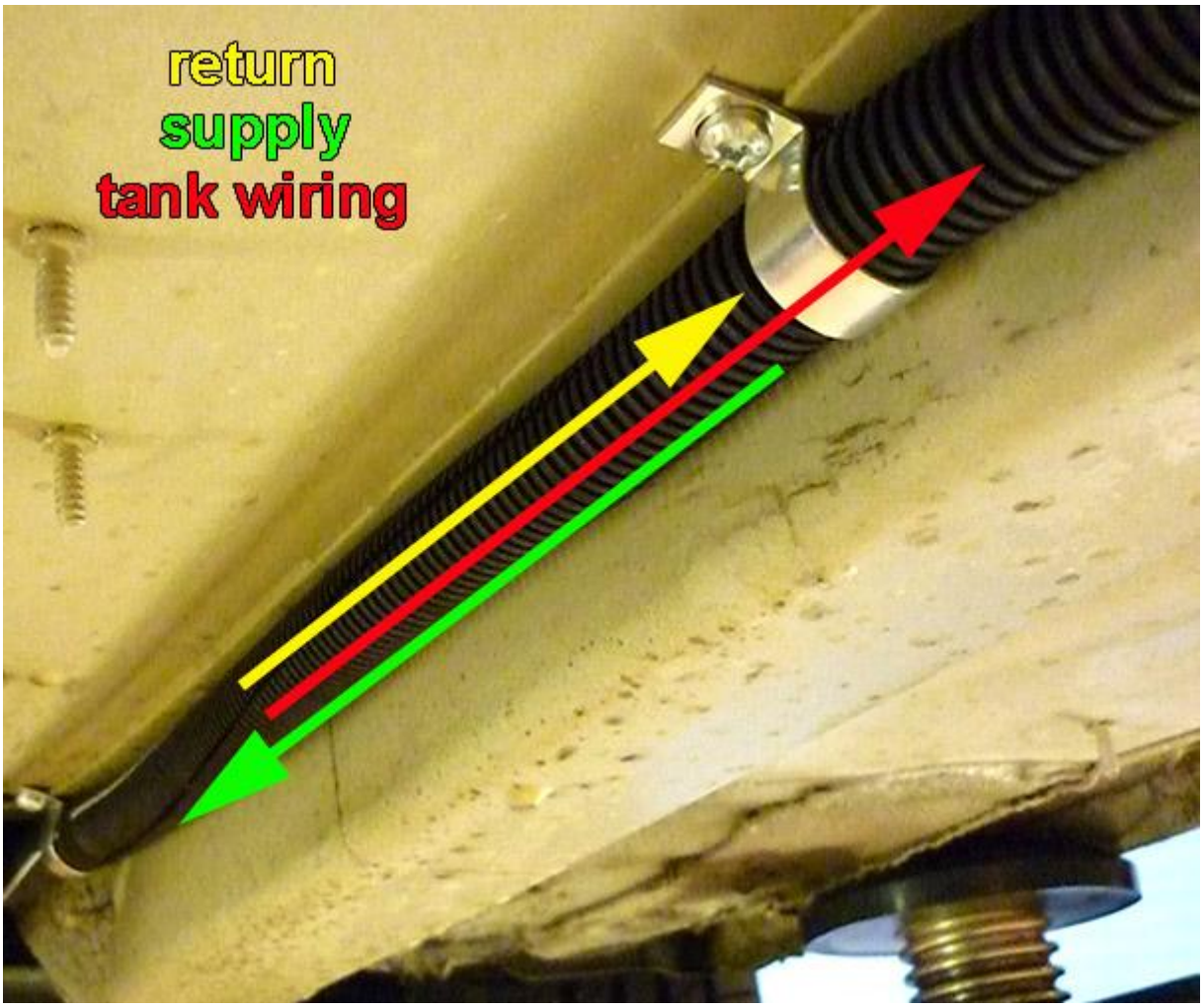
Install the fuel line using two bonded seal washers and banjo bolt :

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

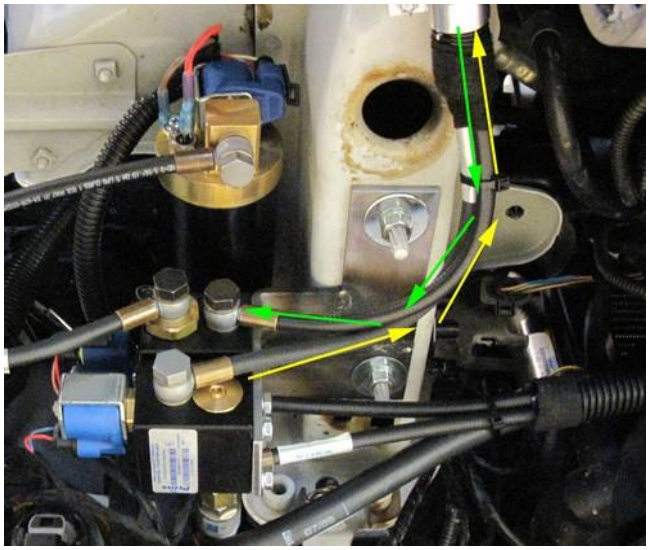
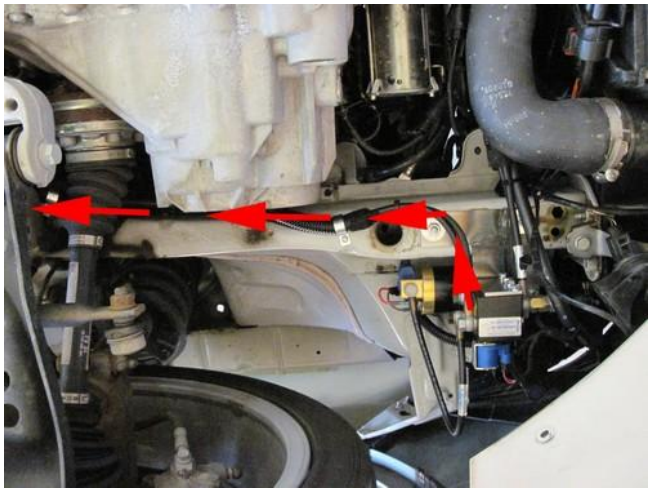
181/300009/A

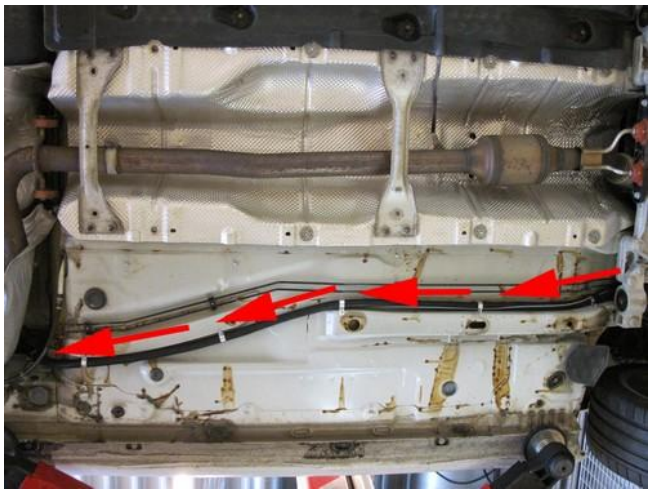
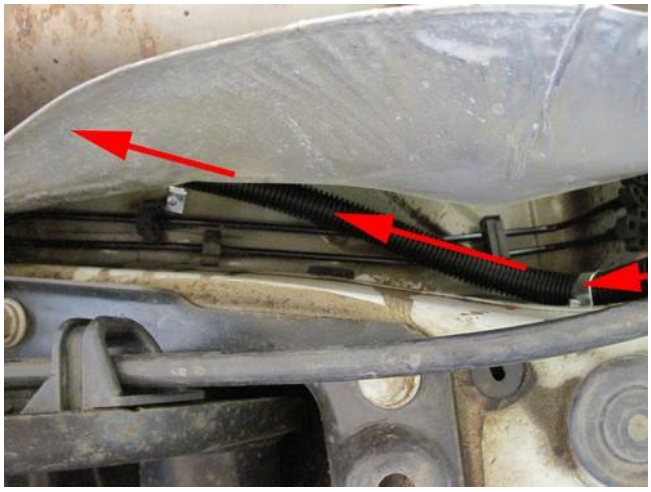
Supply hose / Return hose / Tank wiring - 1

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.

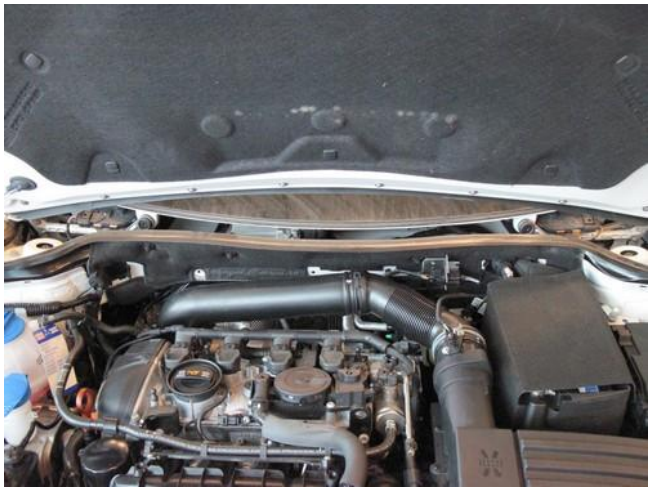


Supply hose / Return hose / Tank wiring - 2

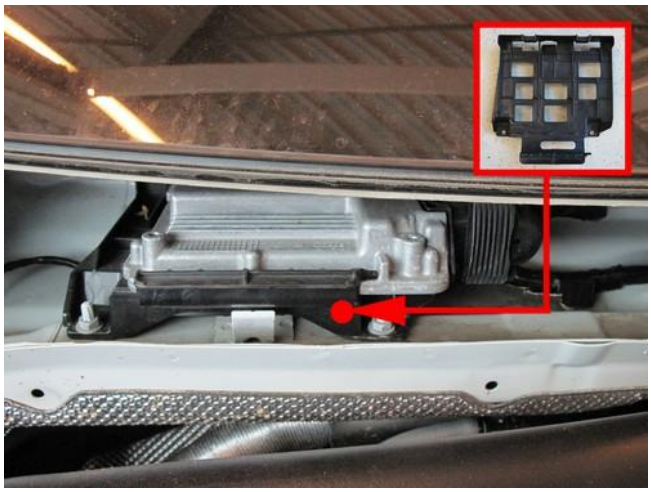



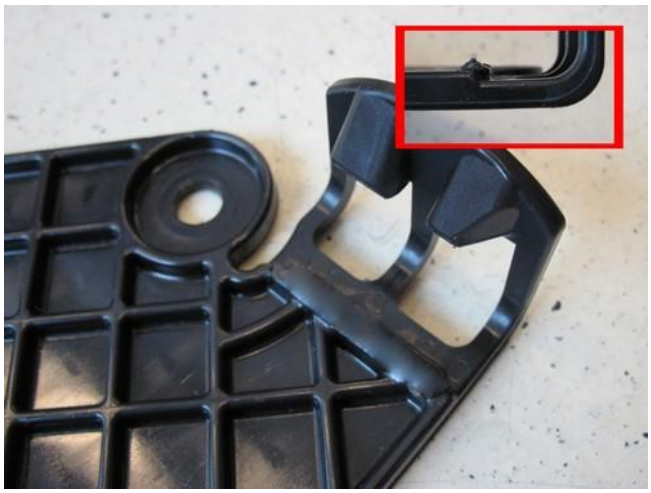

Mounting the AFC - 1




Remove wipers, wiper box and wiper motor.

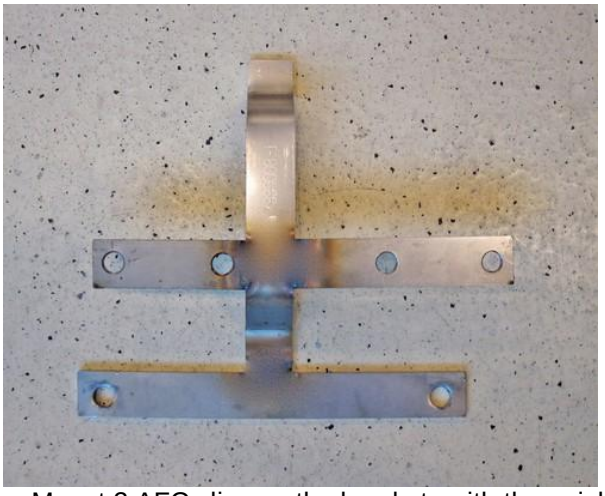
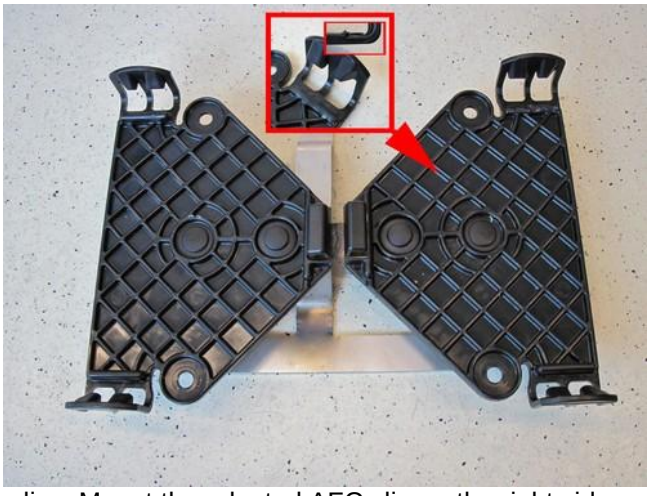



Remove petrol ECU en romove petrol ECU bracket.

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

Mounting the AFC – 2

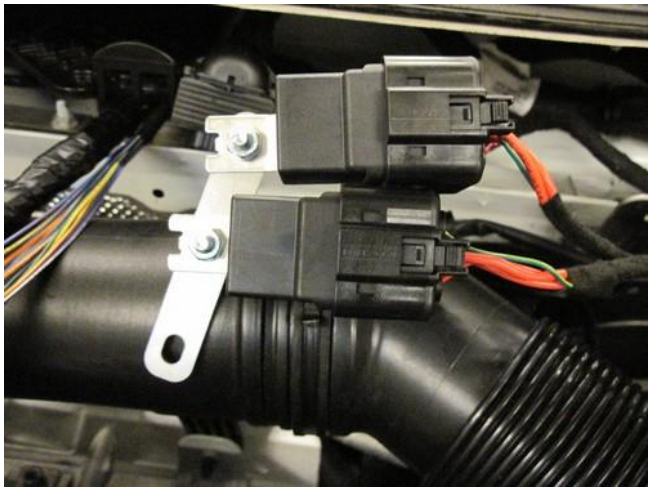



Mount 2 AFC clips on the brackets with the quick clips. Mount the adapted AFC clip on the right side.

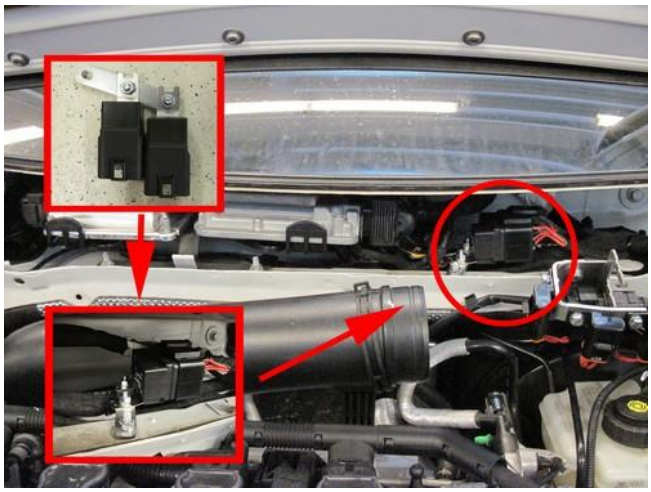

Mount the AFC & petrol ECU on the bracket.

(Example out of car)

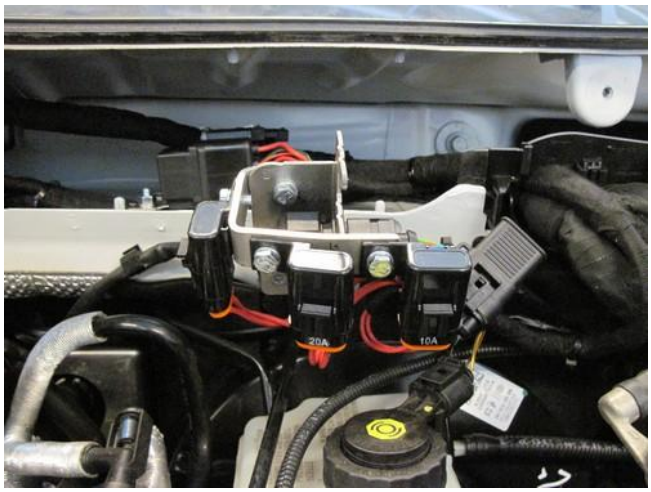
Relays / Fuses / Diagnostic location

Mount relays to bracket with M6 bolts, nuts and washers.

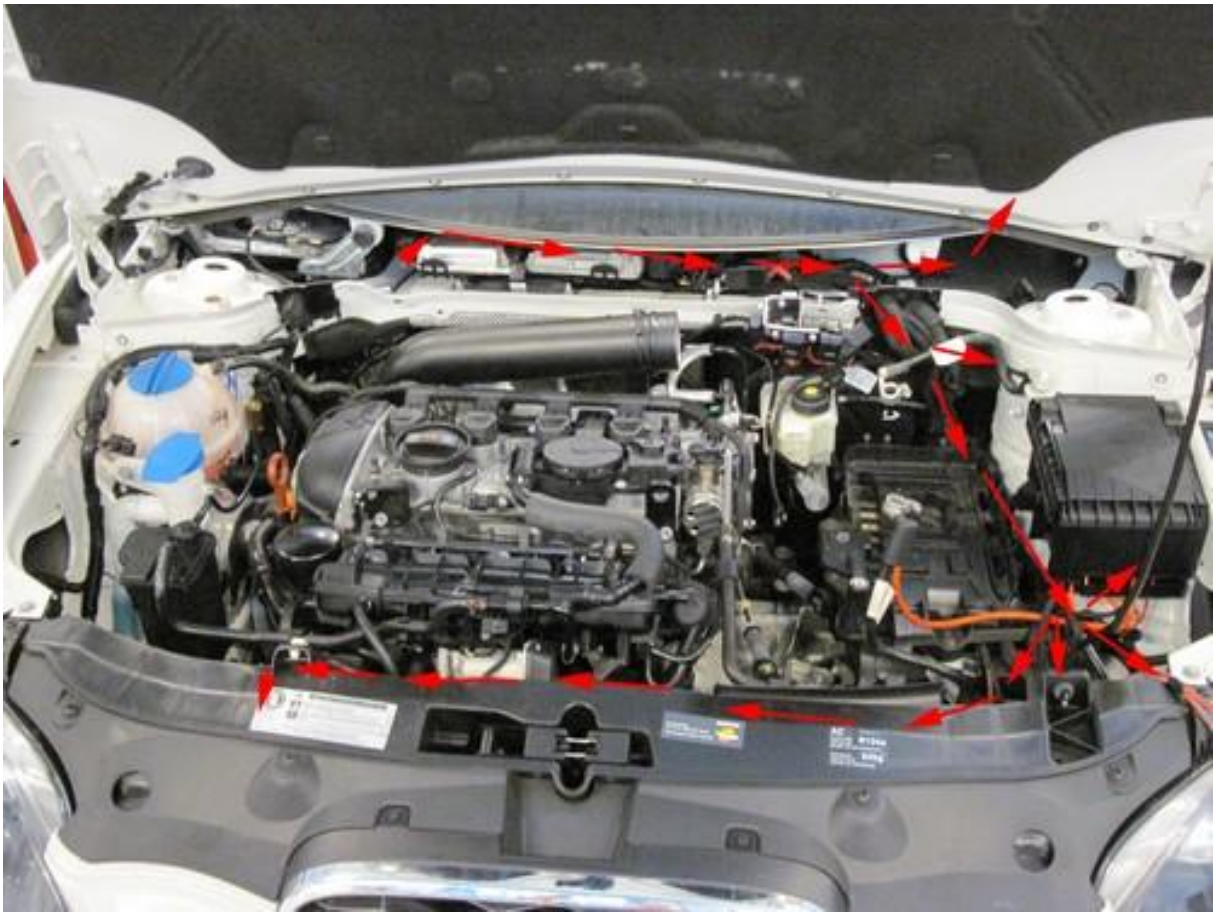



Mount bracket to wiper box.

Mount fuse holders with M6 bolts and spring washers to bracket. Mount brackets with fuses & diagnostic connector to original bracket (see picture) with M6 bolt and spring washer.

Wiring routing / Grummet



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 selection switch

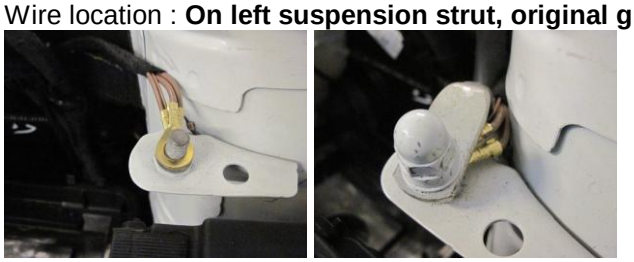
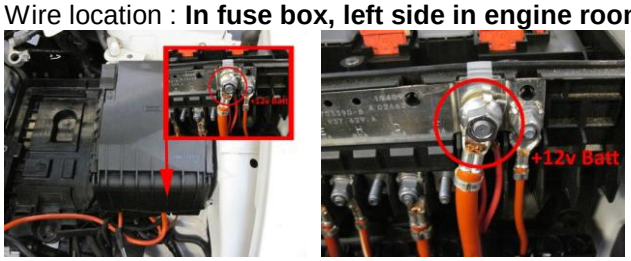
Mount the switch.


Remove light switch cover. Drill hole Ø8,3mm for switch.

Mount switch on light switch cover. Mount cover back to light switch.

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*
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 ring terminals onto the wiring. Wire location : **On left suspension strut, original grounding.** 
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 ring terminals onto the wiring. Do not place the fuse in the holder before having completed the installation of the lpg system. Wire location : **In fuse box, left side in engine room.** 
7 +12V IGNITION	grey - white	Make a connection to ignition + / contact + (+15). Do not place the fuse in the holder before having completed the installation of the lpg system. Wire colour : **blue / black** Wire location : **T94/87** on petrol ECU
121 Wake-up	Red-grey	Wire colour : **black** Wire location : **T14/2** behind left headlight 

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	*High pressure sensor* Sensor side. ECU side. Wire colour : **blue** Wire location : **T60/40** on petrol ECU
17 Analog 2 10 Simulation 2	Blue-black Green-black	*Wideband sensor* Sensor side. ECU side: not connected Wire colour : **green** Wire location : **T94/78** on petrol ECU
19 Analog 4	Blue-white	*High pressure sensor ground* Wire colour : **brown** Wire location : **T60/13** on petrol ECU
23 Digital Simulation	Green-red	*MAF sensor out (to sensor)* Wire colour : **green / yellow (twisted)** Wire location : **T94/23** on petrol ECU
115 Digital input 4	Yellow-red	Wire colour : not connected Wire location : not connected
117 Digital input 3	Yellow-black	*High pressure sensor +5V* Wire colour : **black / grey** Wire location : **T60/29** on petrol ECU
119 Digital input 2	Yellow-grey	*MAF sensor in (to petrol ECU)* Wire colour : **green / yellow (twisted)** Wire location : **T94/23** on petrol ECU

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
27 +5V sensor 37 C ground 20 Analog 3 MAP*	Red Brown Blue	*For measuring the inlet manifold pressure (MAP).* Connect the 3-pole connector to the Prins MAP sensor. Sensor location: not connected
8 RPM	Purple-white	*For measuring the engine speed signal.* Wire colour : **grey** Wire location : **T60/53** on petrol ECU
15 T-ect	Grey	*For measuring the engine coolant temperature*. Wire colour : **yellow** Wire location : **T60/57** on petrol ECU
6 Lambda1 WB	Orange	*For measuring the oxygen sensor signal.* Wire colour : not connected Wire location : not connected
42 Lambda2 WB 10KΩ	Orange-white	*For measuring the oxygen sensor signal.* Wire colour : not connected Wire location : not connected

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

Driver room

3-pole micro connector 66 Ground fuel switch 3 +12V fuel switch 49 LIN fuel switch	 Brown Red yellow	*Connect the 3-pole connector to the Prins fuel selection switch.*
51 CAN-High	Blue-yellow	EOBD connector **pin 6** - located below steering wheel, left side
70 CAN-Low	Blue	EOBD connector **pin 14** - located below steering wheel, left side

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		*Connect the 3-pole connector to the tank level sensor.*
40 Ground tank gauge	Brown	Connector pin 1
12 Tank level in	Blue	Connector pin 2
11 + tank level supply	Red	Connector pin 3
2-pole connector tank lock-off	Green-yellow Brown	Pump driver to lock-off power Pump driver to lock-off ground
2-pole connector tank pump	Red 2.5mm^2 Brown 2.5mm^2	Pump driver power Pump driver ground
2-pole connector steering/diagnose	Grey Green	Pump driver diagnose Pump driver control
3-pole fusite	Red Brown .	1. Pump power 2. Pump ground 3. not used

Wiring tank relay		
2 + tank relay	Red	Pin 86 of the tank relay
26 Ground tank relay	Green-yellow	Pin 85 of the tank relay
+12V BATT fused	Red 2.5mm^2	Pin 30 of the tank relay
+12V pump driver	Red 2.5mm^2	Pin 87 of the tank relay

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.