

ALTERNATIVE
FUEL SYSTEMS

Prins

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



Installation manual Dedicated PART 2/2



MANUFACTURER	Seat
TYPE	Altea
ENGINE DISPLACEMENT	1200
NUMBER OF VALVES	16
ENGINE CODE / NUMBER	CBZA / CBZB
VEHICLE CATEGORIES	M
TRANSMISSION	MT
VERSION	Direct LiquiMax-2.1
PETROL ECU MANUFACTURER / CODE	Continental Simos 10.13
HIGH PRESSURE PETROL PUMP	Hitachi type 2
HIGH PRESSURE PETROL INJECTOR	-
MODEL YEAR:	2011-
SYSTEM APPROVAL NUMBER (R115)	E4-115R-000010 / DLM-LPG 03
LOCATION R115 SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	361/070009/A
MANUAL NUMBER	076/2101500
DATE	2013-10-17

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Version 2013-09-28 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-2.0 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 / servicing** 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 the 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 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)
- 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
- Engine coolant

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	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
(filtered) Banjo bolt	10	14
Supply line connection	15	13
Fuel module Allen bolts	20	7
Filler hose connection	50	22
Boost pump clamp	7	10
Hitachi cover	220	46

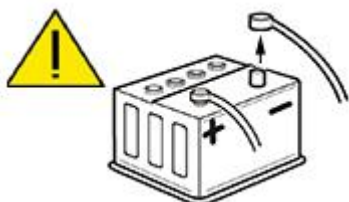
EXPLANATION OF SYMBOLS :



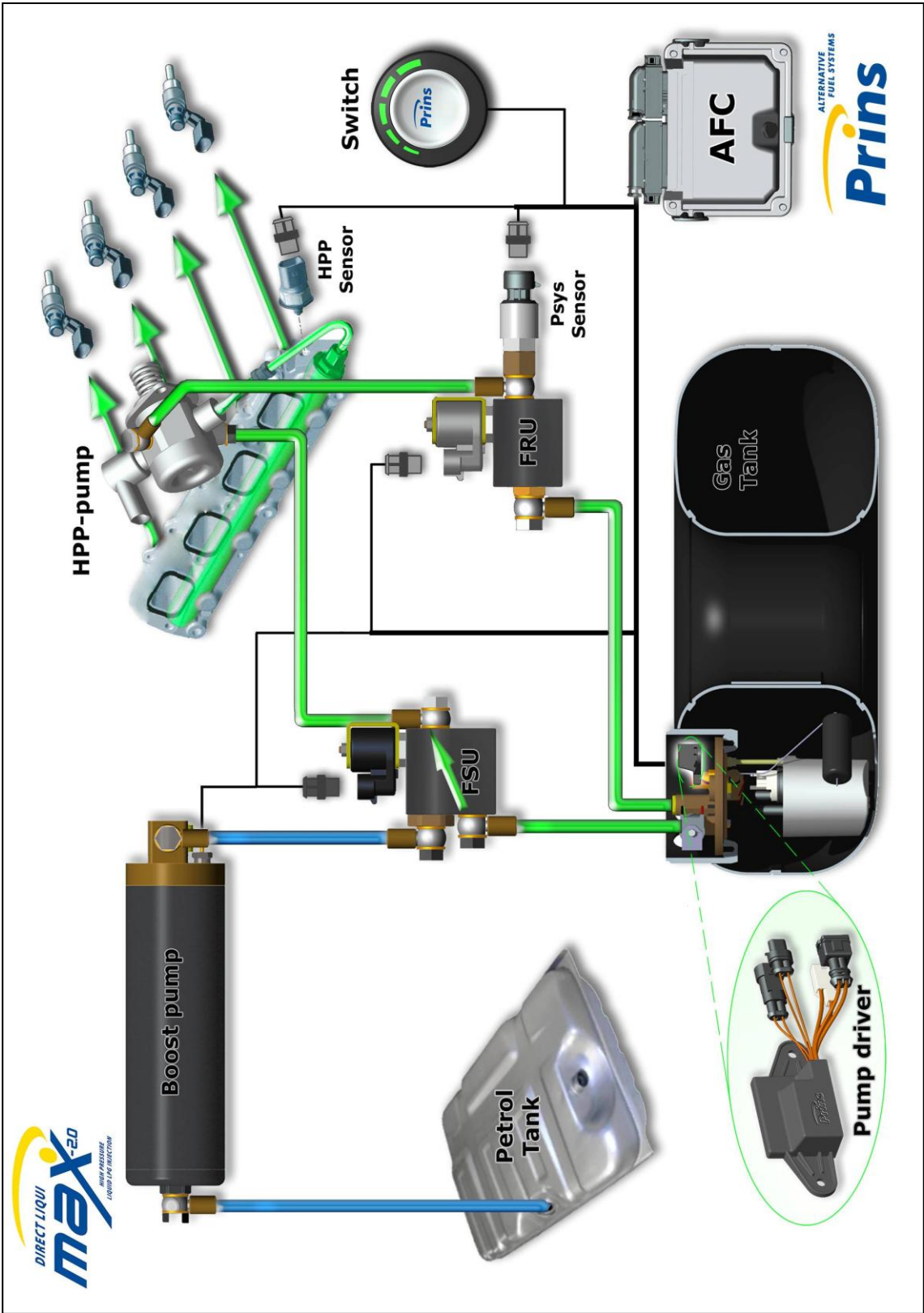
= IMPORTANT,
CAUTION



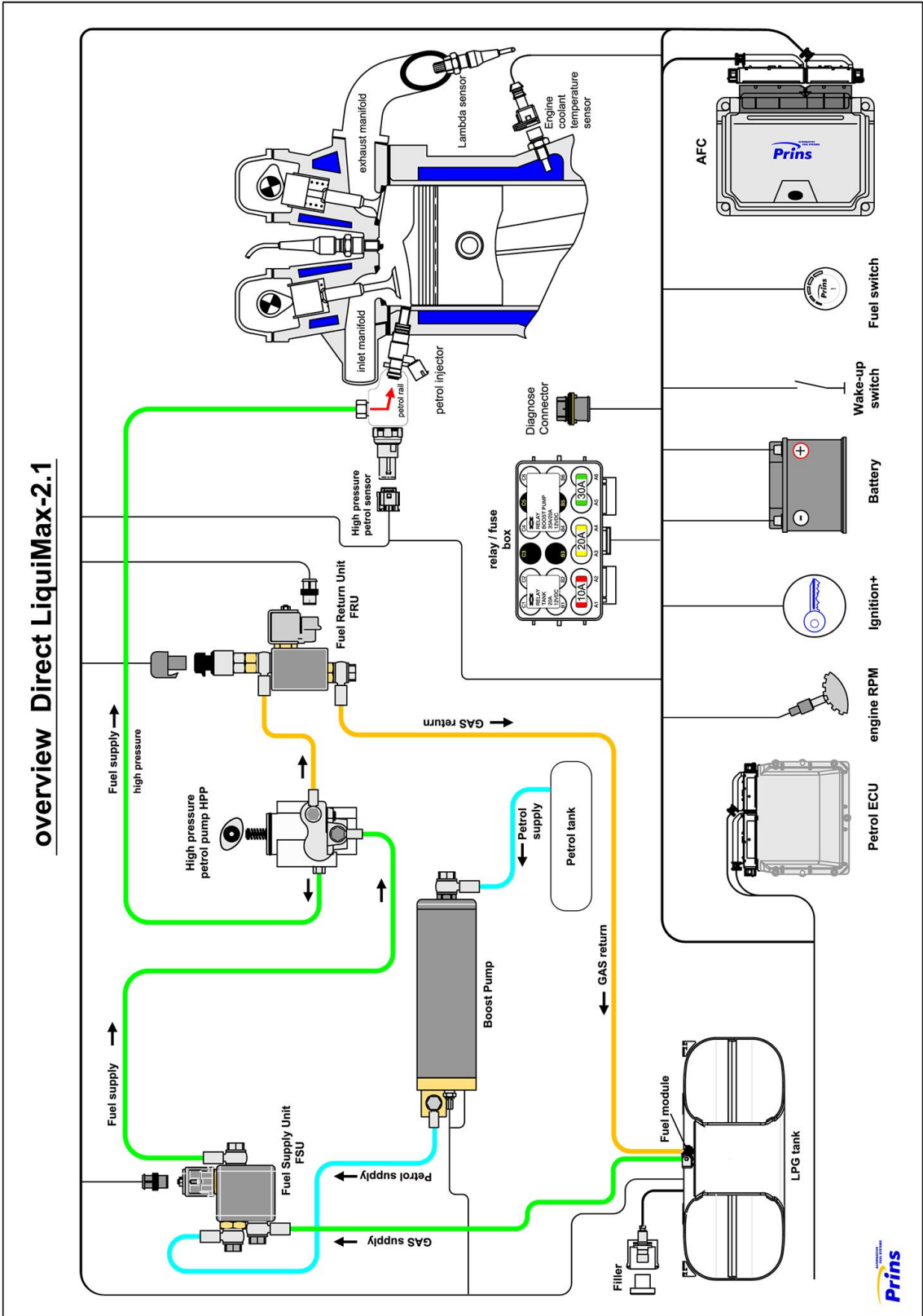
= WEAR SAFETY GOGGLES



Direct LiquiMax-2.1









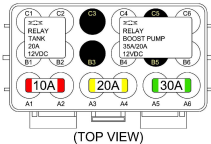

Direct LiquiMax-2.1 diagram




Direct LiquiMax parts / approval numbers

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

DLM-2.1 component location overview

<div>HPP pump</div> 		<div>Petrol ECU</div> 
<div>FSU</div> 		<div>AFC</div> 
<div>FRU</div> 		<div>Fuse / relay box</div> 
<div>Boost pump</div> 		

	<div>R115 approval sticker : Right side centre door post</div>
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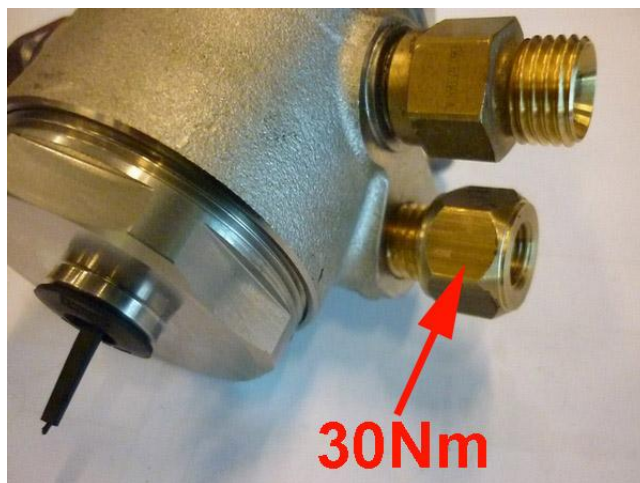
High pressure pump Supply



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



Remove petrol inlet.



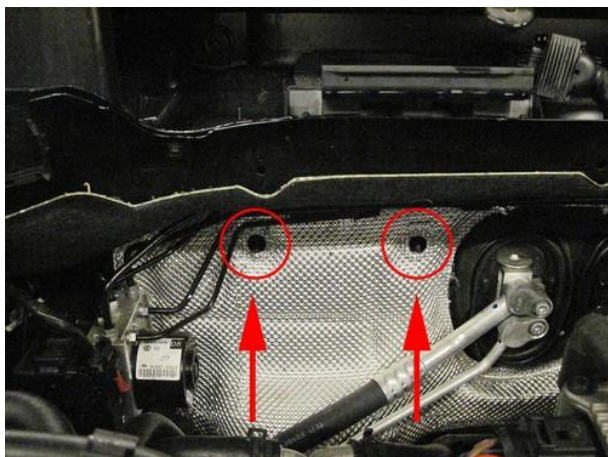
Mount supplied inlet.

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, 220Nm.



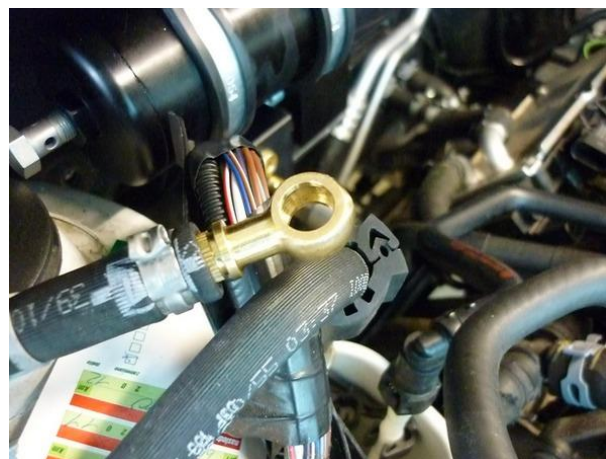
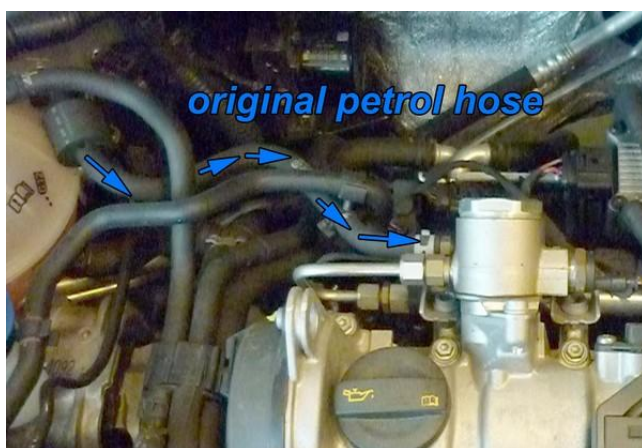
Tighten cover with 220 Nm, do not forget the sealing ring between pump and pump cover.

Boost pump / Fuel hose connection boost pump

Mount bracket with boost pump clamp to original threaded ends.



Mount boost pump with rubber ring to bracket/clamp.

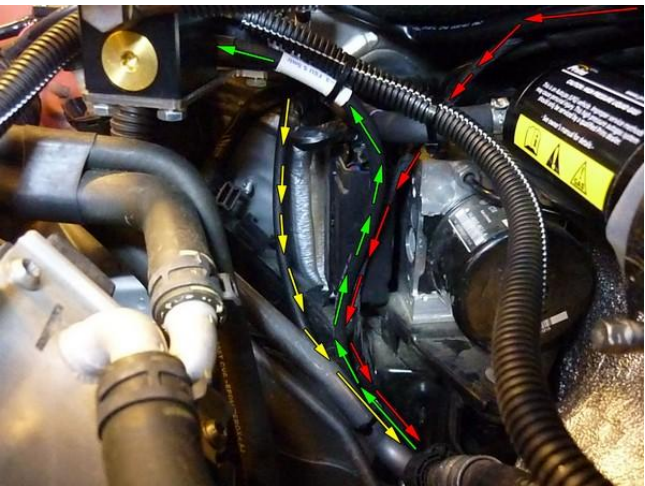


Connect the fuel hose with the XD-5 banjo eye to the inlet of the boost pump.

Mounting the Fuel Units



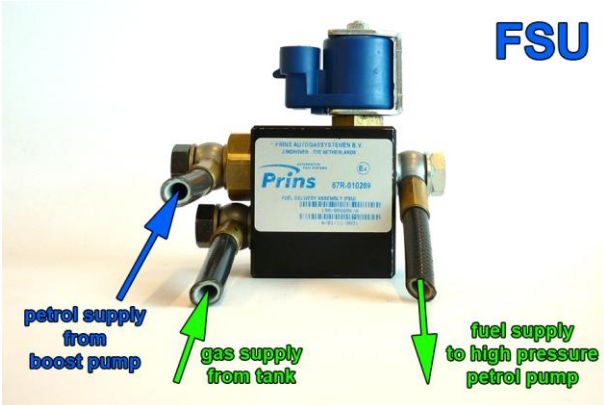
FRU and FSU



supply, return, tank wiring

Fuel Supply Unit / Fuel Return Unit

FSU

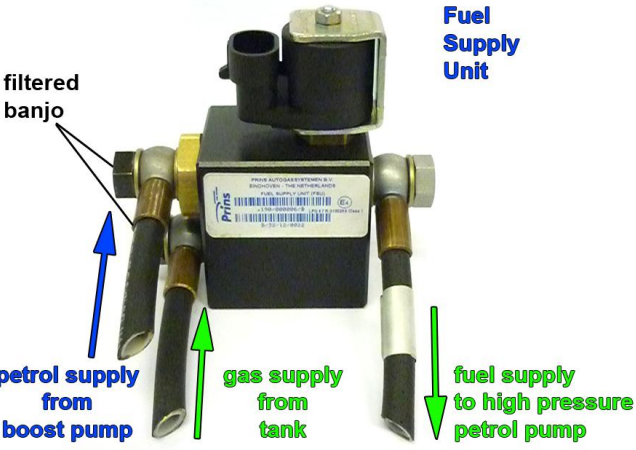


petrol supply from boost pump

gas supply from tank

fuel supply to high pressure petrol pump

Fuel Supply Unit



filtered banjo

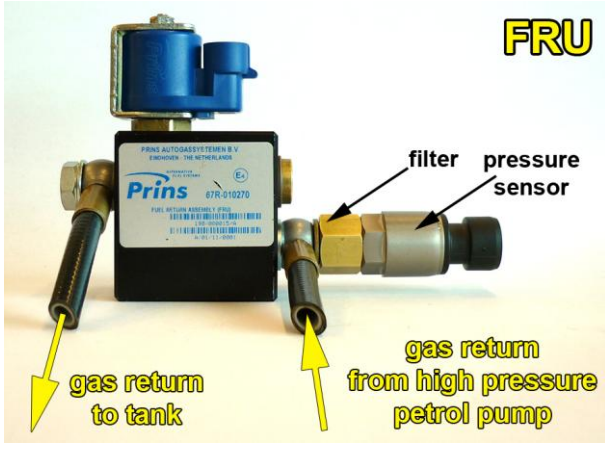
petrol supply from boost pump

gas supply from tank

fuel supply to high pressure petrol pump

Black filtered banjo will only be used on inlet connections !

FRU



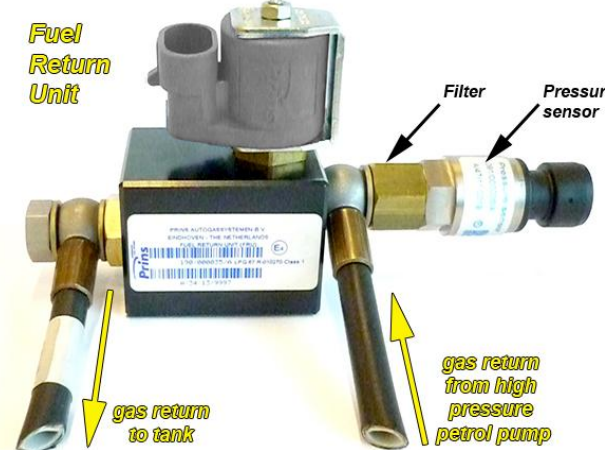
filter

pressure sensor

gas return to tank

gas return from high pressure petrol pump

Fuel Return Unit





Filter

Pressure sensor

gas return to tank

gas return from high pressure petrol pump

Filter inside sensor banjo



Fuel units hose routing

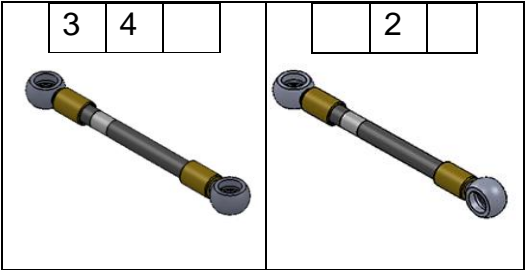


Boost pump / Fuel hose connection boost pump

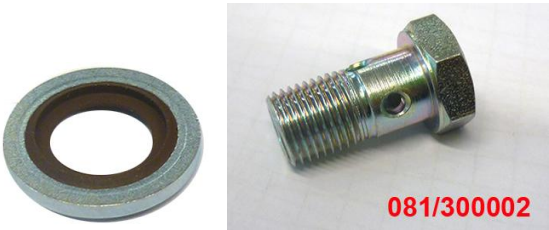


Lpg / petrol fuel lines

Hose	from	to	Length (cm)
1 XD-5 eye	Adapter original petrol hose	Petrol boost pump	-
2 XD-3	Fuel supply unit	High pressure petrol pump	40 (90°)
3 XD-3	Petrol boost pump	Fuel supply unit	35 (90°)
4 XD-3	Fuel return unit	High pressure petrol pump	30



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

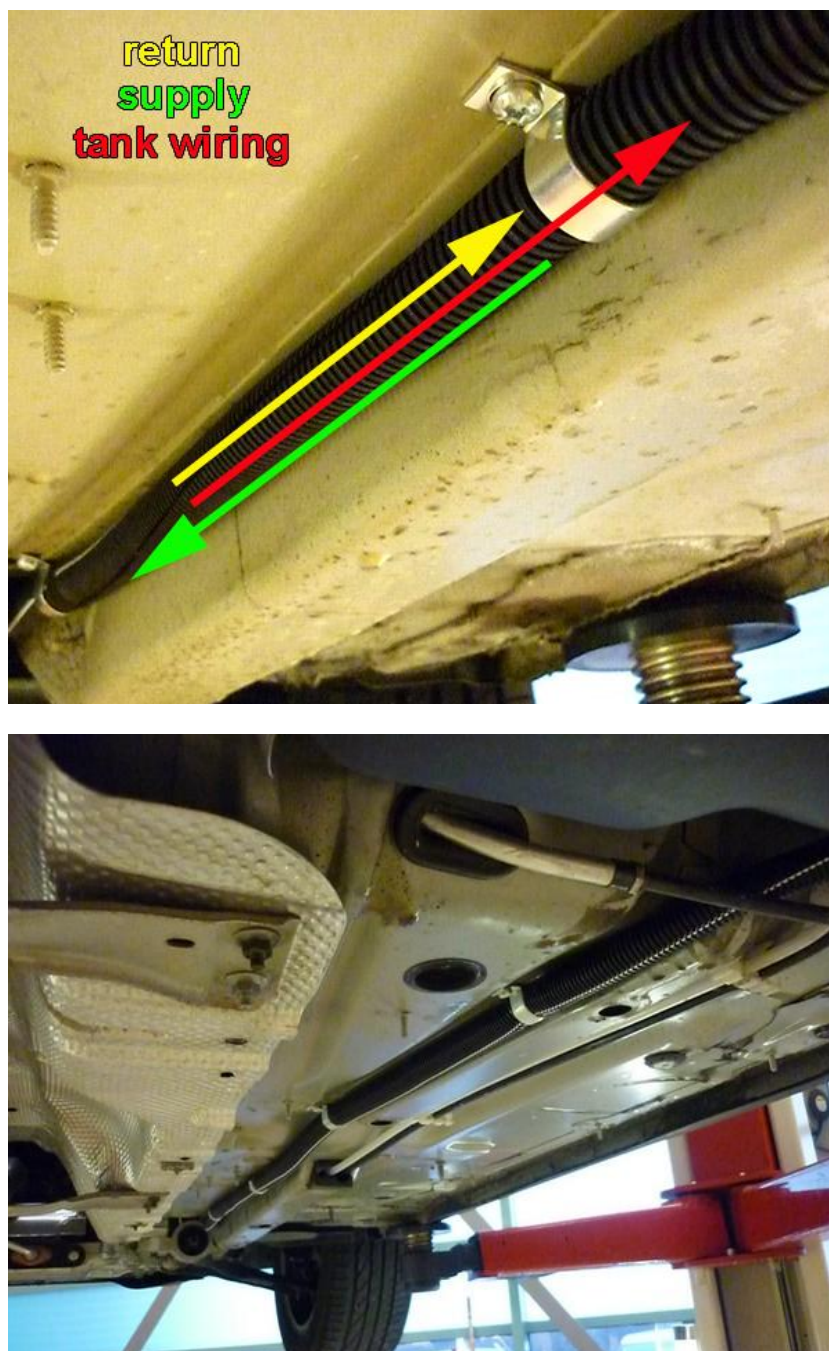


Filtered banjo: (FSU supply inlets / boost pump inlet / HPP inlet : black filtered banjo) :



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.



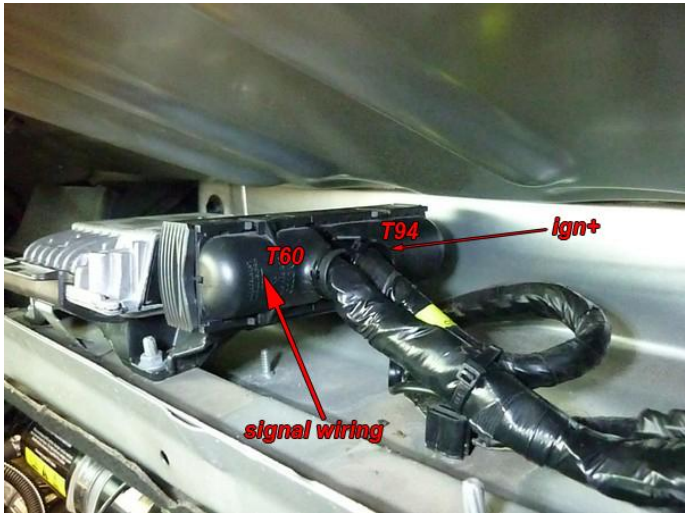
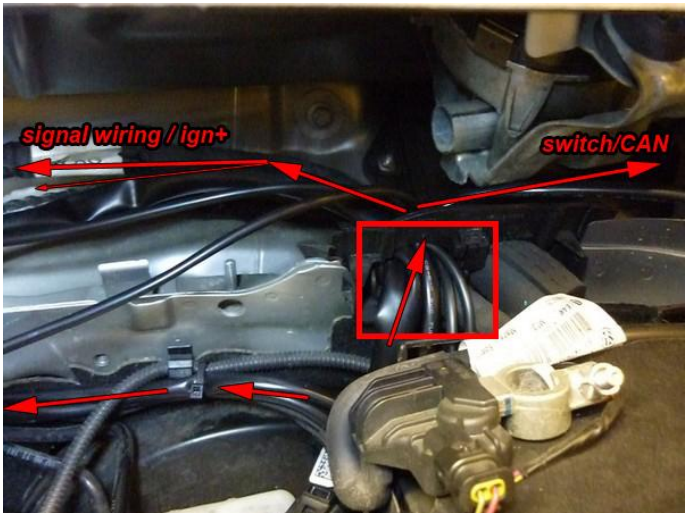
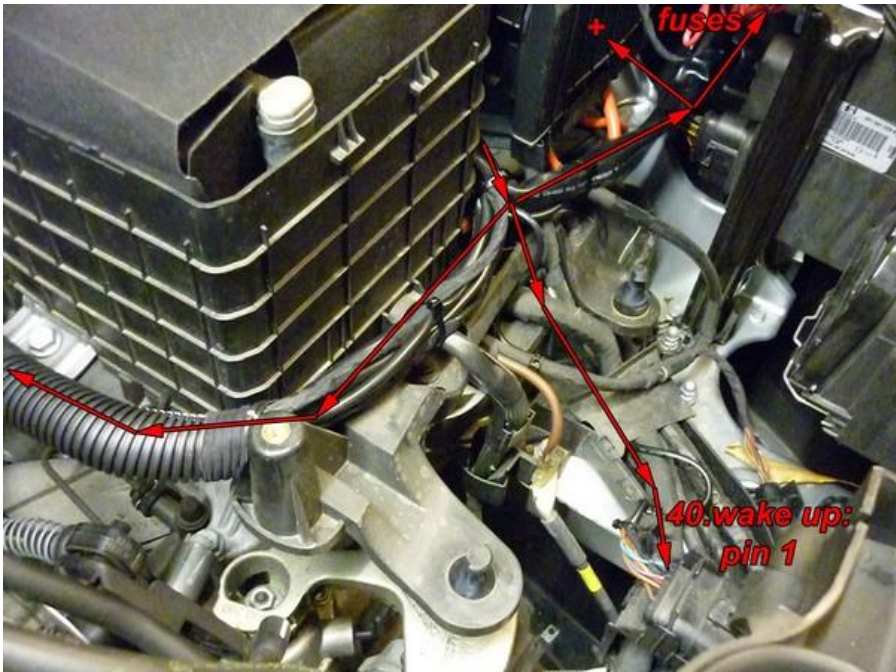
Mounting the AFC



Mounting the fuse / relay box



Wiring AFC



Switch wiring





Mount the switch.

Mounting the fuel selection switch option 1



Mounting the fuel selection switch option 2



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

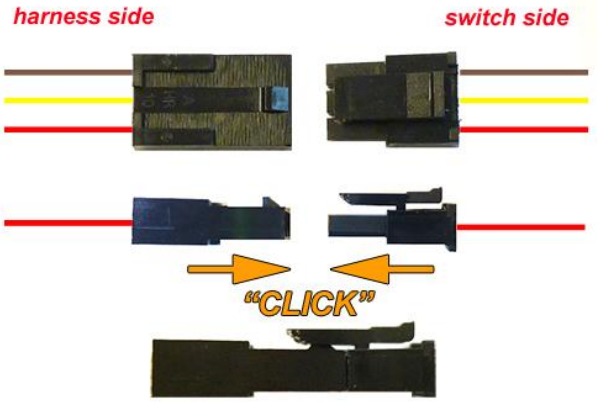
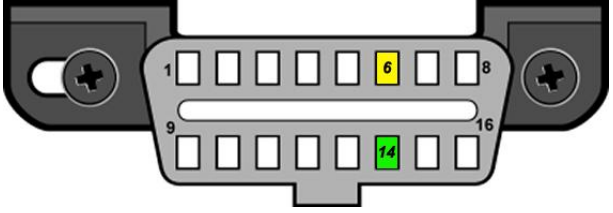


Mount switch on light switch cover. Mount cover back to light switch.

Electrical connections

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

Driver room

Wire number / code		Wire colour	Connection
3-pole micro connector			
66	Ground fuel switch	Brown-black	Connect the 3-pole connector to the Prins fuel selection switch.
3	+12V fuel switch	Red-white	
49	LIN fuel switch	Yellow	
			
51	CAN-High	Yellow	EOBD connector pin 6
70	CAN-Low	Green	EOBD connector pin 14
			



Electrical connections

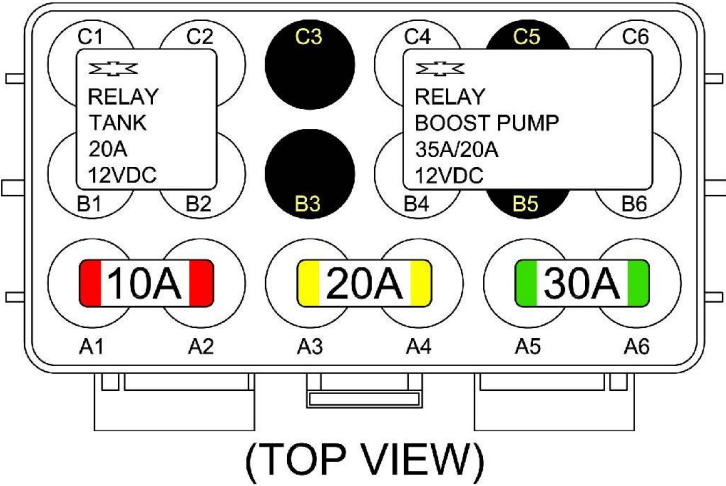
Insulate not used wires.

Wire number / code		Wire colour	Connection
22	LSS 1	Purple-white	Insulate
23	LSS 2	Purple-green	Insulate
42	Digital out pull up 2	Red-purple	insulate
58	+12V switched	Red-white	insulate
56	DI 2	Yellow-green	insulate
60	DI 3	Yellow-grey	insulate
20	AD 3	Blue-pink	insulate
19	AD 4	Blue	insulate
21	AD 9	Blue-purple	insulate
74	DAC 3	Green-pink	insulate
10	DAC 2	Green	insulate

Electrical connections


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

1-32 MAIN GND ecu MAIN GROUND SENSE	Brown	Connect to the '-' of the battery (-31) ; use a ring terminal. 
4 – 13 +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 fuses 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.
Insulate not used wires.

Wire number / code	Wire colour	Connection
40 Wake-up	Grey-red	<i>Wake-up</i> Wire colour : black Wire location : 14-pole connector under filter box : Pin 1 
63 Ground Shift	Blue-orange	<i>High pressure petrol sensor ground</i> Wire colour : brown-blue Wire location : petrol ecu, connector T60, pin 13
61 DI 4	Yellow-blue	<i>Digital Input 4, 5Volt</i> Wire colour : red-blue Wire location : petrol ecu, connector T60, pin 29
36-25		<i>High pressure petrol sensor signal interruption</i> Wire colour : grey-blue Wire location : petrol ecu, connector T60, pin 40
36 AD 6	Blue-brown	Sensor side
25 DAC 1	Green-white	Petrol ecu side
17 AD 2	Blue-green	<i>Intake air temperature</i> Wire colour : yellow Wire location : petrol ecu, connector T60, pin 42
8 RPM engine speed	Purple-white	<i>For measuring the engine speed signal.</i> Wire colour : black-green Wire location : petrol ecu, connector T60, pin 53
18 AD 1	Blue-white	<i>Analog in (sensor side) MAP sensor in</i> Wire colour : purple-black Wire location : petrol ecu, connector T60, pin 55
15 T-ect	Grey	<i>For measuring the engine coolant temperature.</i> Wire colour : brown Wire location : petrol ecu, connector T60, pin 57
7 +12V IGNITION	Grey - white	<i>Make a connection to +ignition / contact+ (+15).</i> Do not place the fuses in the holder before having completed the installation of the lpg system. Wire colour : black-blue Wire location : petrol ecu, connector T94 , pin 87

Electrical connections

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

Engine room

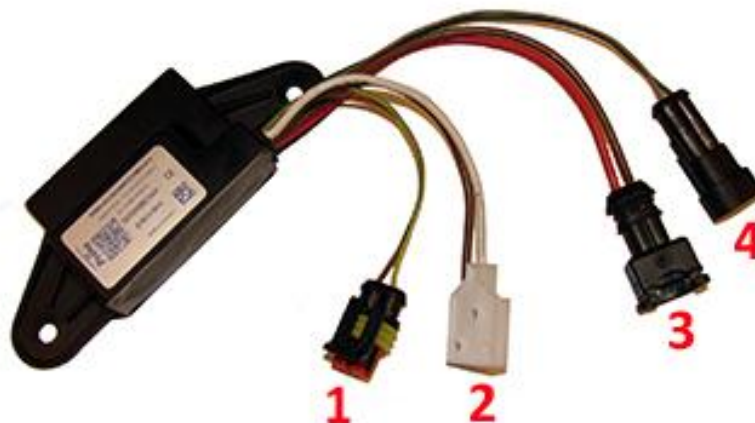
Wire number / code	Wire colour	Connection
<i>3-pole connector</i>		Connect the 3-pole connector to the Psys sensor positioned into the Fuel Return Unit.
35 Ground Psys pin A	Brown	Sensor wire pin A
9 +5V sensor pin B	Red-blue	Sensor wire pin B
16 Psys pin C	Green	Sensor wire pin C
<i>2-pole connector FSU, black</i>		
24 + Lock-off FSU	Yellow-green	Connect the 2-pole connector to the lock-off valve of the Fuel Supply Unit
31 C Ground	Brown-black	
<i>2-pole connector FRU, grey</i>		
43 + Lock-off FRU	Red-white	Connect the 2-pole connector to the lock-off valve of the Fuel Return Unit
34 C Ground	Brown-black	
<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-black	Connector pin 4
<i>Boost pump relay</i>		
2 + relay boost pump	Red-white	Pin 86 of the boost pump relay C4
26 Ground BP relay	Purple-blue	Pin 85 of the boost pump relay B6
+12V fused BATT	Red 2.5mm2	Pin 30 of the boost pump relay C6-A5
+12V Boost pump	Red 2.5mm2	Pin 87 of the boost pump relay B4
<i>Wiring tank pump driver relay</i>		
57 + driver relay	Red-white	Pin 86 of the driver relay C1
73 LSS 4 tank relay	Purple-blue	Pin 85 of the driver relay B2
+12V BATT fused	Red 2.5mm2	Pin 30 of the driver relay C2-A4
+12V driver	Red 2.5mm2	Pin 87 of the driver relay B1

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 33 Ground tank gauge 12 Tank level in 11 + tank level supply	Brown-black Blue Red-blue	Connect the 3-pole connector to the tank level sensor.
2-pole driver connector 71 LSS 3 PWM driver 64 AD 5 driver diagnose	Purple-pink Blue-grey	Connect the 2-pole connector to the pump driver (4).
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 power 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 71 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.