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Installation manual Dedicated PART 2/2

MANUFACTURER	AUDI
TYPE	A6
ENGINE DISPLACEMENT	3200
NUMBER OF VALVES	24
ENGINE CODE / NUMBER	AUK
VEHICLE CATEGORIES	M
TRANSMISSION	AT
VERSION	Direct LiquiMax-2.0
PETROL ECU MANUFACTURER / CODE	SIEMENS / VDO SME SIMOS 6.2
HIGH PRESSURE PETROL PUMP	HITACHI GEN 1
HIGH PRESSURE PETROL INJECTOR	HITACHI 06E-906-036C JSD7-41
MODEL YEAR:	2005
SYSTEM APPROVAL NUMBER (R115)	E4-115R-000010 DLM-LPG 03
LOCATION SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	366/070008/A

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NUMBER :	076/2611000
DATE :	2012-03-26
VERSION NR :	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 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
- 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	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	50,1	13
M 8 x 1,25	27,3	13
M 10 x 1	103	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 Hitachi	220	46

EXPLANATION OF SYMBOLS :



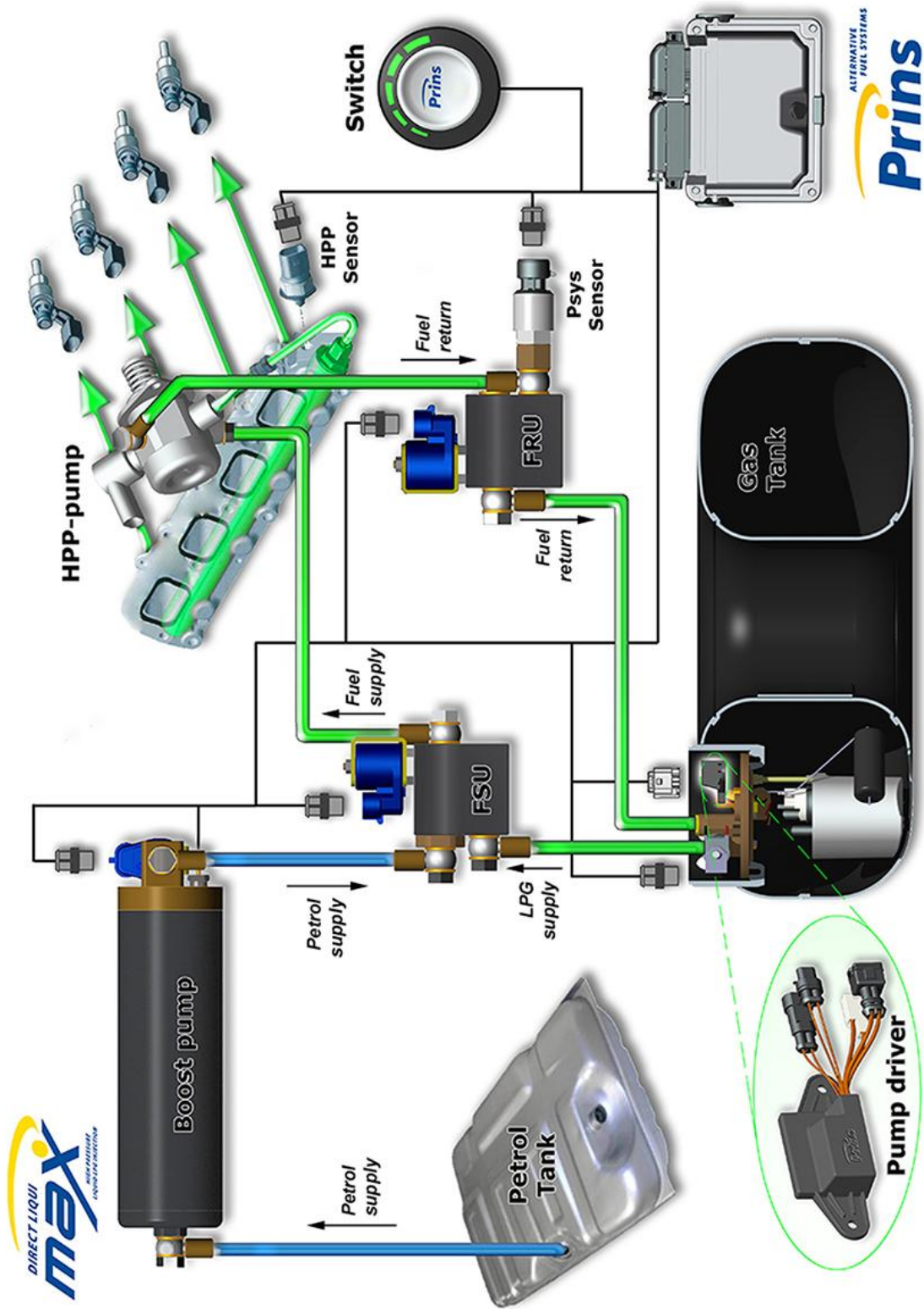
= IMPORTANT, CAUTION



= WEAR SAFETY GOGGLES

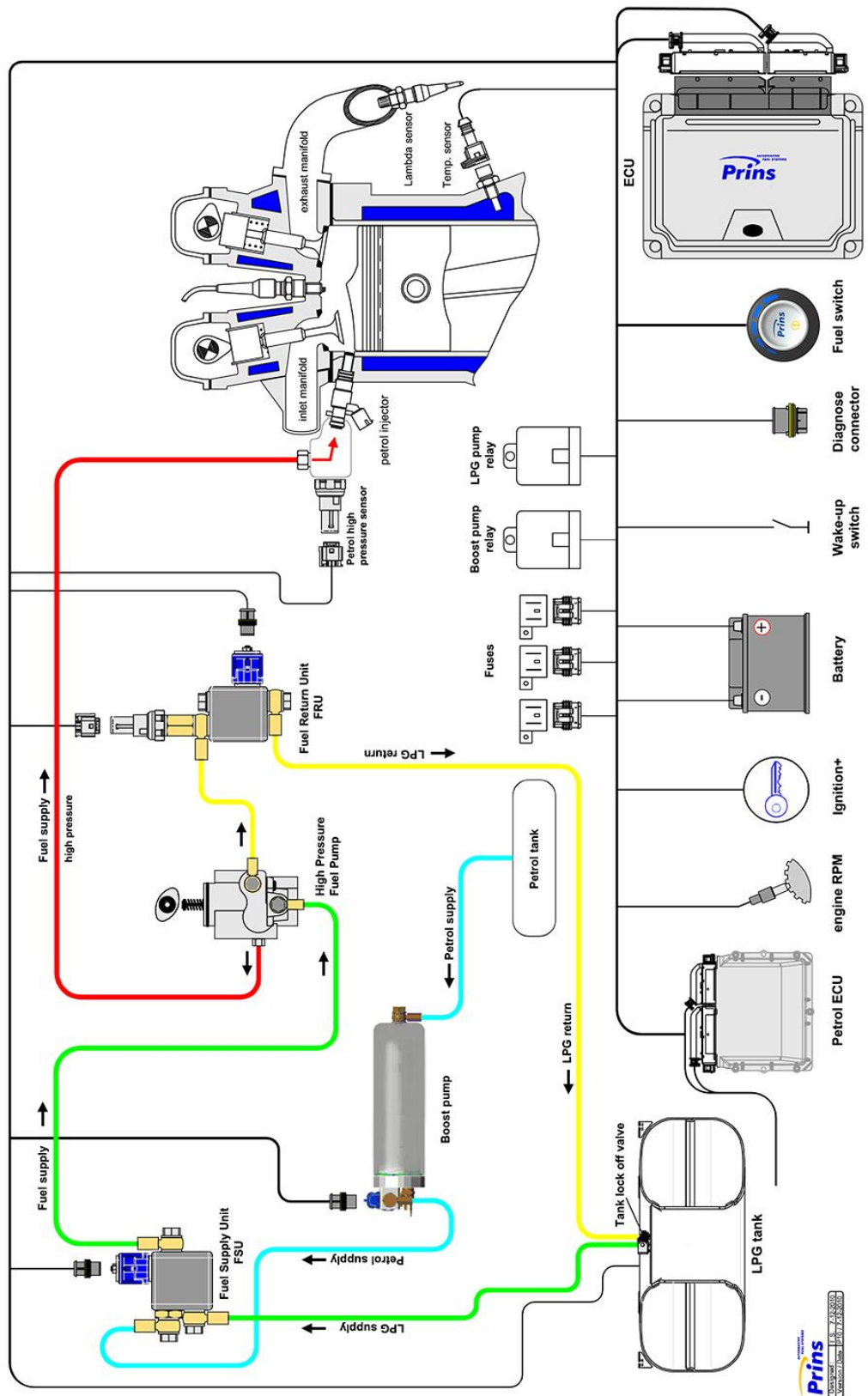


Direct LiquiMax



Overview Direct LiquiMax

overview Direct Liqui Max



Direct LiquiMax parts / approval numbers

 1st generation  2th generation	 1st generation  2th generation
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
	 XD-3 LPG  XD-4 LPG
Prins ECU : E4-67R-010098 E4-10R-030507	Fuel lines series XD : E4-67R-010247 XD3 E4-67R-010247 XD4



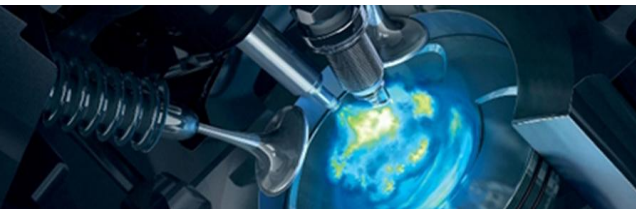
Mounting and connection points



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



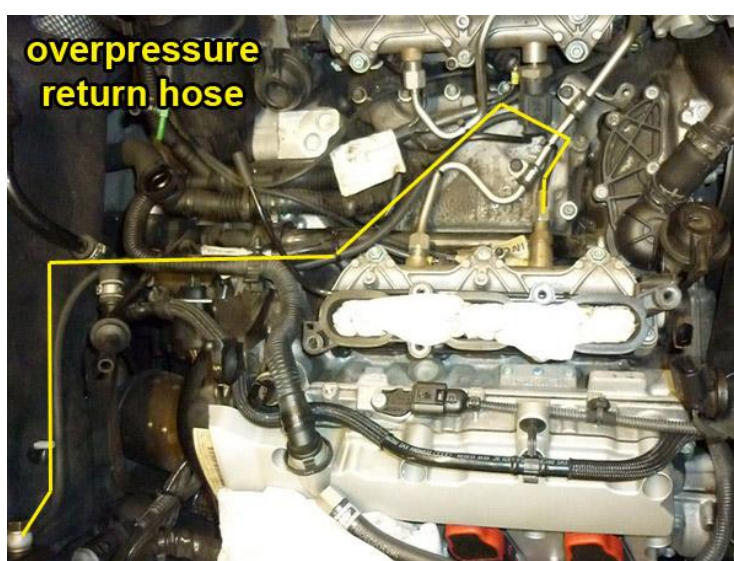
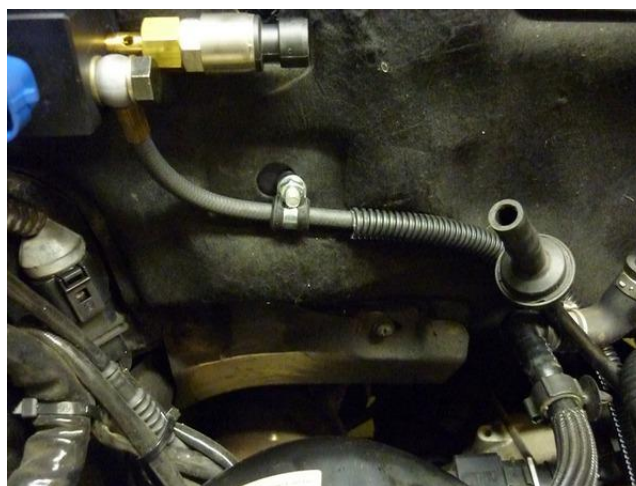
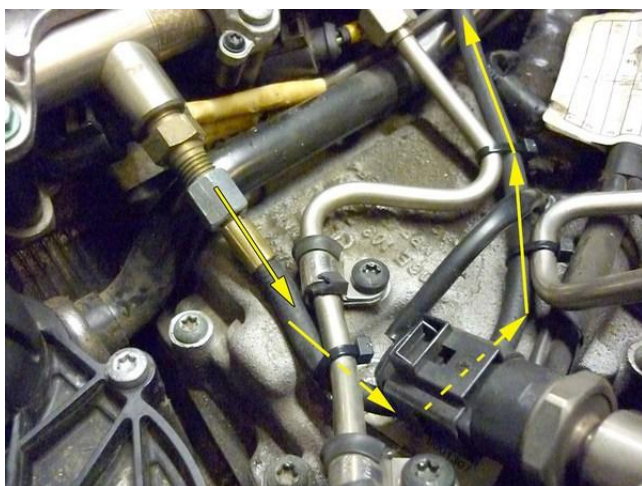
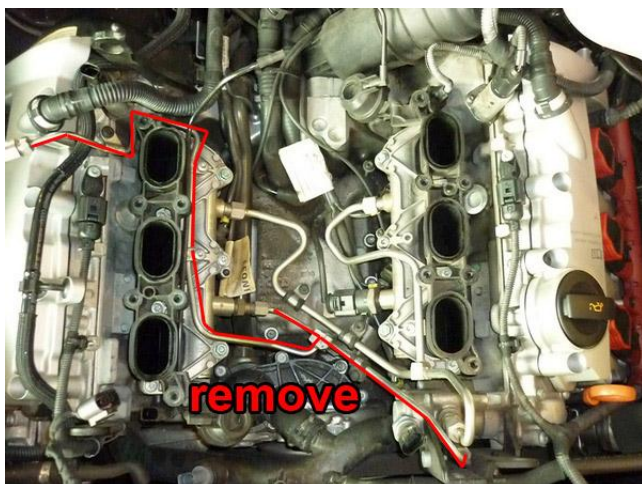
L:
R115 approval sticker :
Right side centre door post





Remove high pressure return / supply line

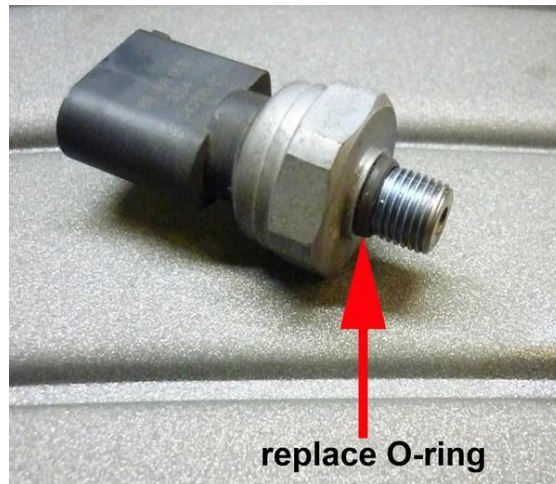
Remove inlet manifold. Remove petrol line...**Careful!! Petrol under pressure !!**



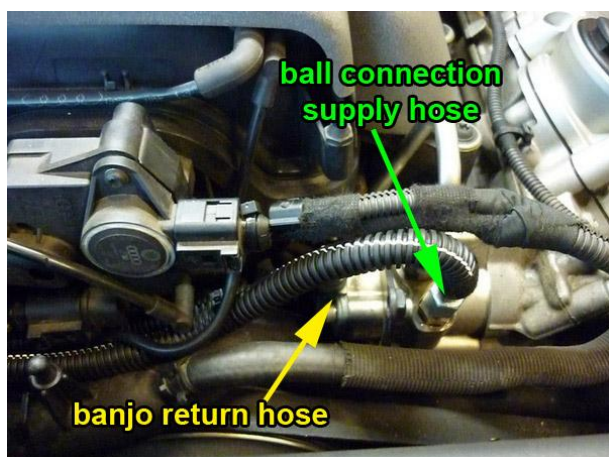
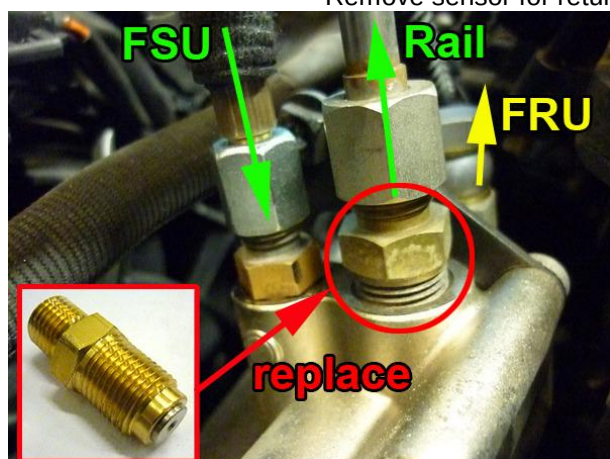
High pressure pump installation



Remove pressure sensor and replace the O-ring.
Extend the sensor wiring for 55 cm.



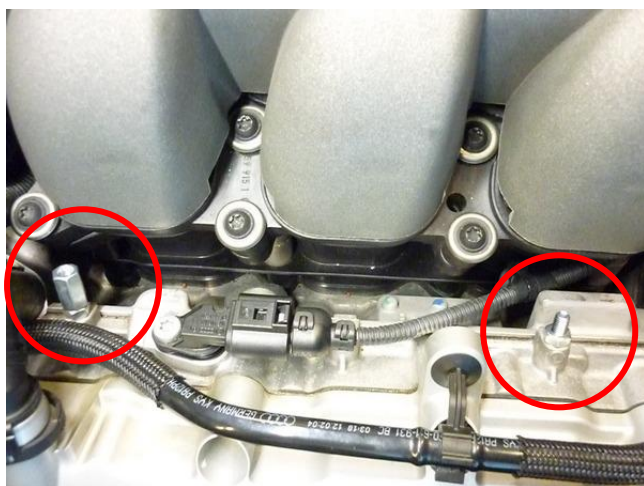
Remove sensor for return hose banjo connection.



Supply and return hoses



Boost pump

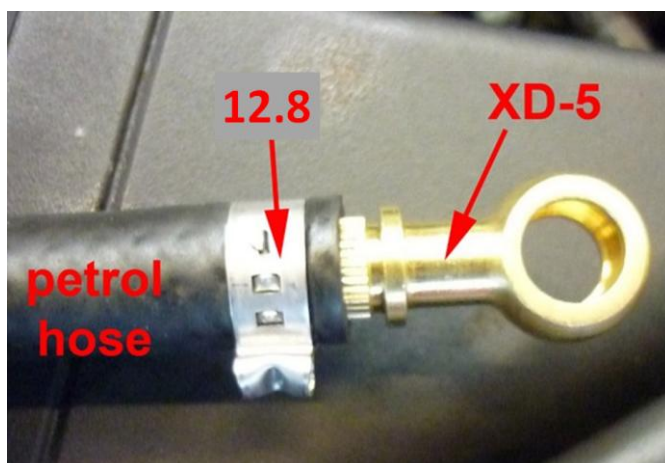


Connection of the fuel hose to the boost pump.

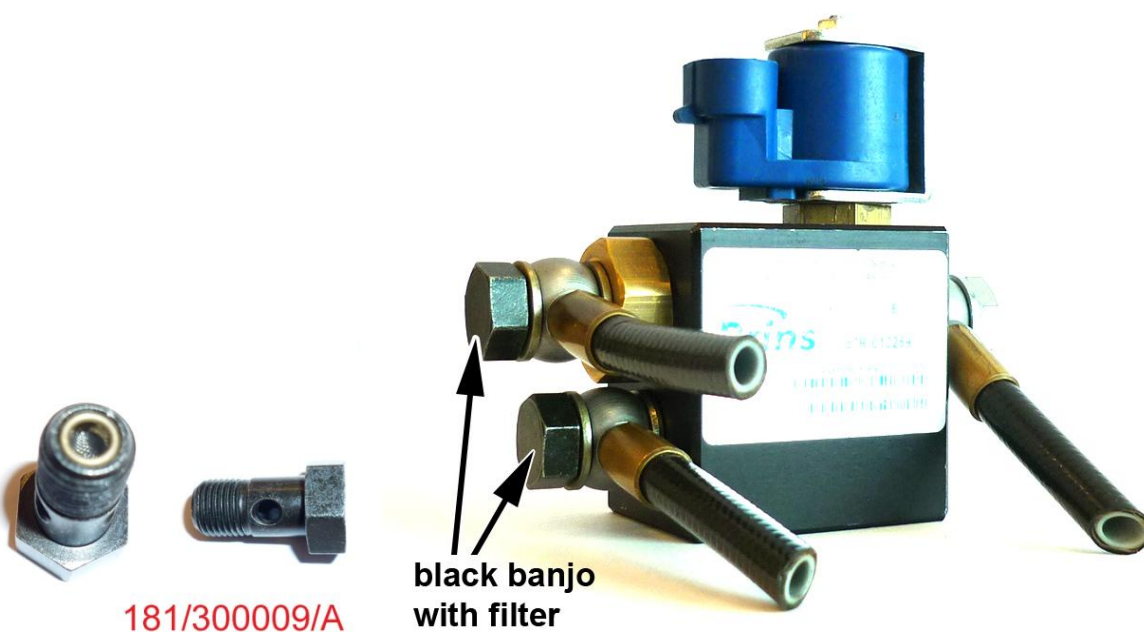
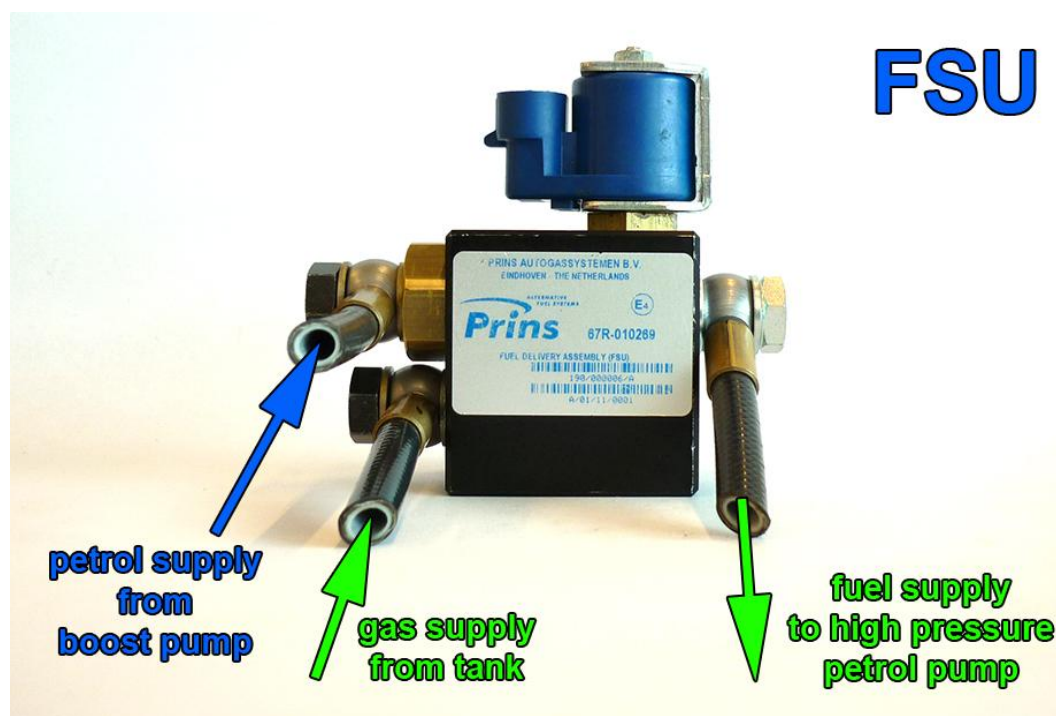
Connect the fuel hoses with an adapter to the boost pump.



Remove original petrol hose and replace with 60cm



Fuel Supply Unit



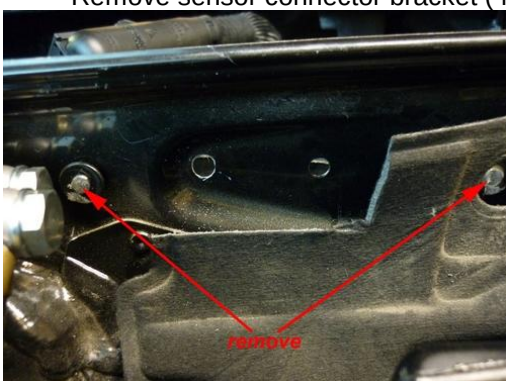
Black filtered banjo will only be used on inlet connections !



Mounting the Fuel Units



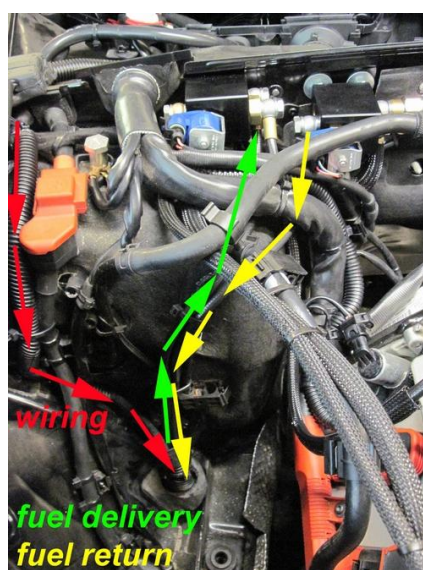
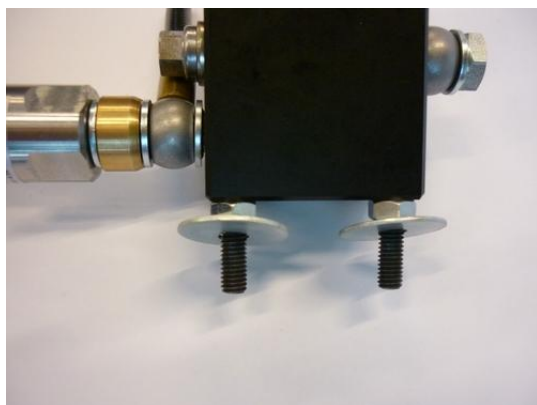
Remove sensor connector bracket (not used) and remove threaded ends.



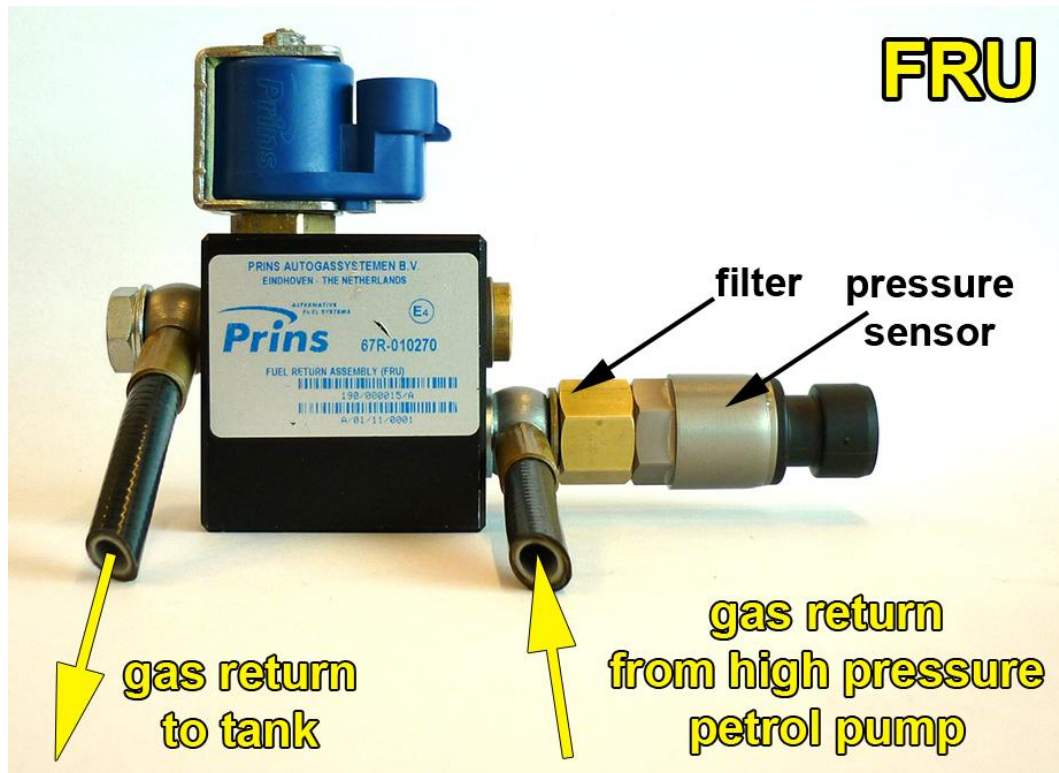
Position the units and drill 3 holes of 7mm



Mounting the Fuel Return Unit



Fuel Return Unit



Lpg / petrol fuel lines

Hose	from	to	Length (cm)
Ø8mm	replaced petrol hose	Petrol boost pump	60
XD-3	Fuel supply unit	High pressure petrol pump	125
XD-3	Petrol boost pump	Fuel supply unit	65
XD-3	Fuel return unit	High pressure petrol pump	105
XD-3	Fuel return unit	High pressure petrol rail	80



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



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

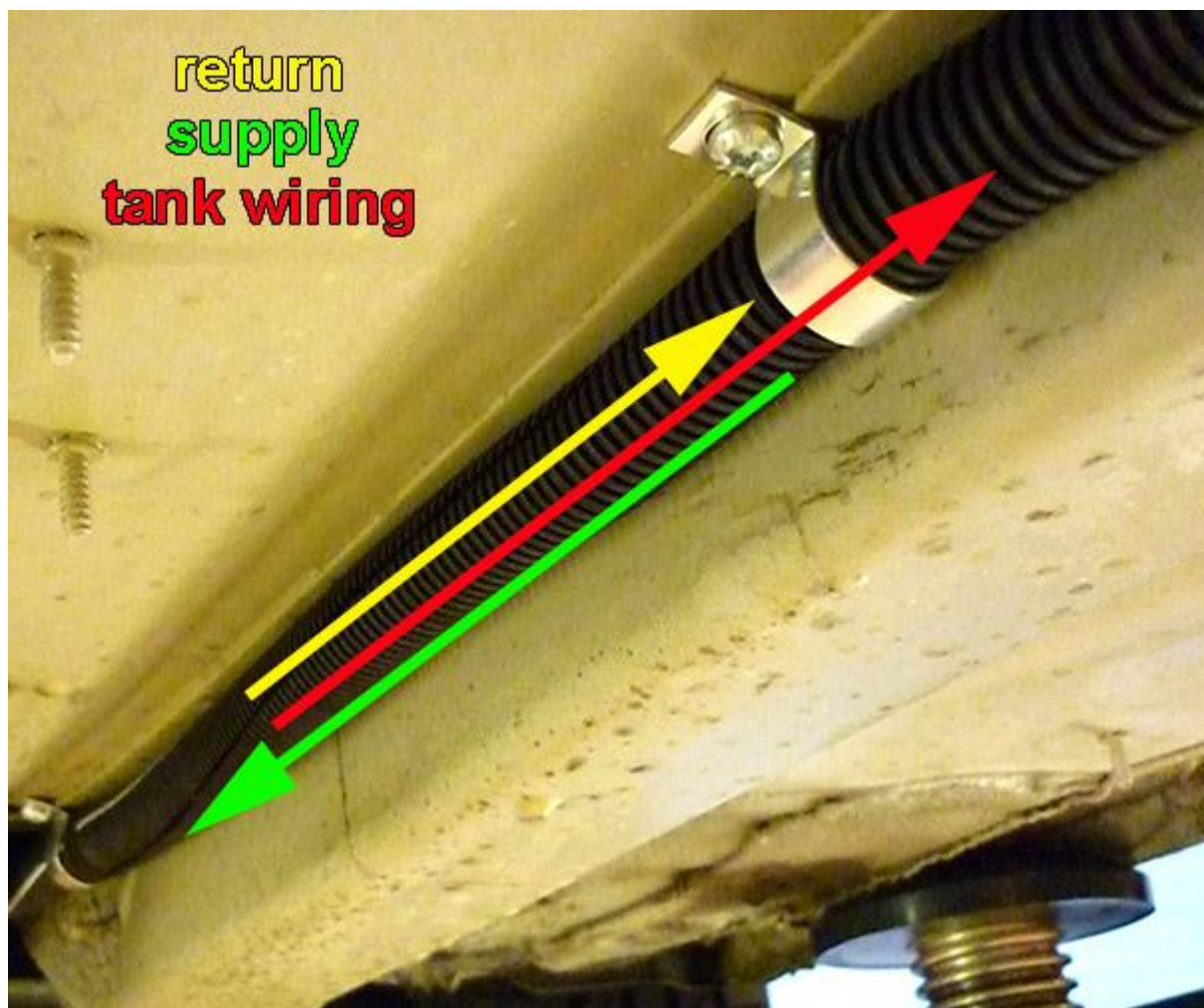


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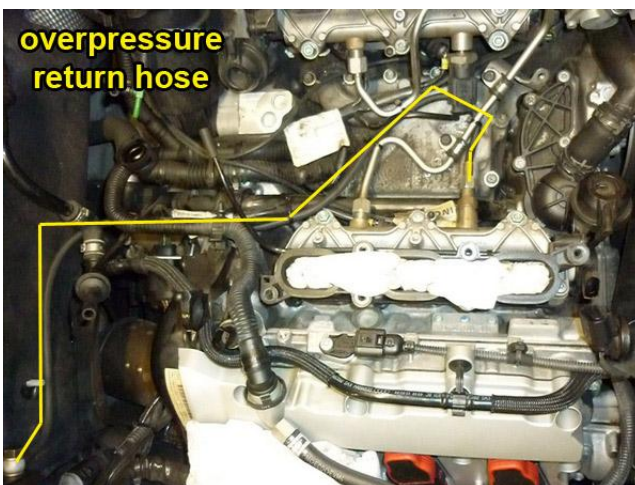
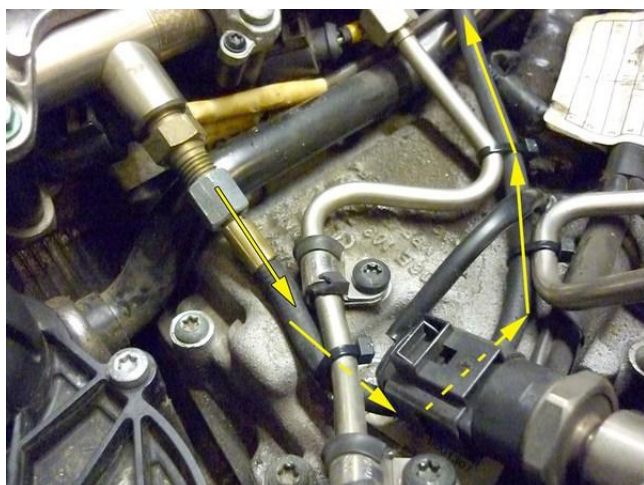


Supply hose – Return hose – Tank wiring

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.

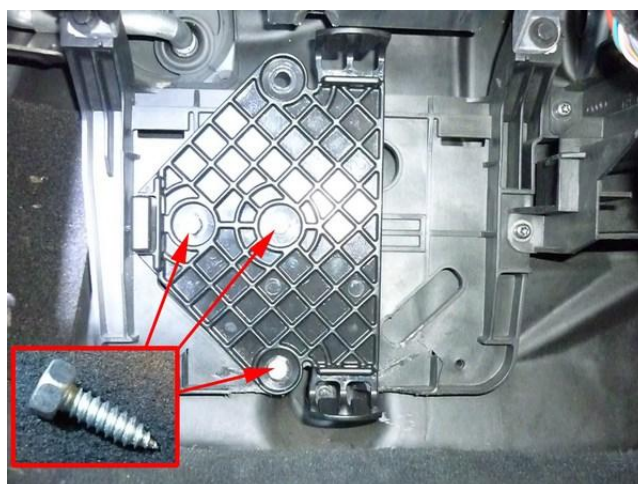


Hose routing

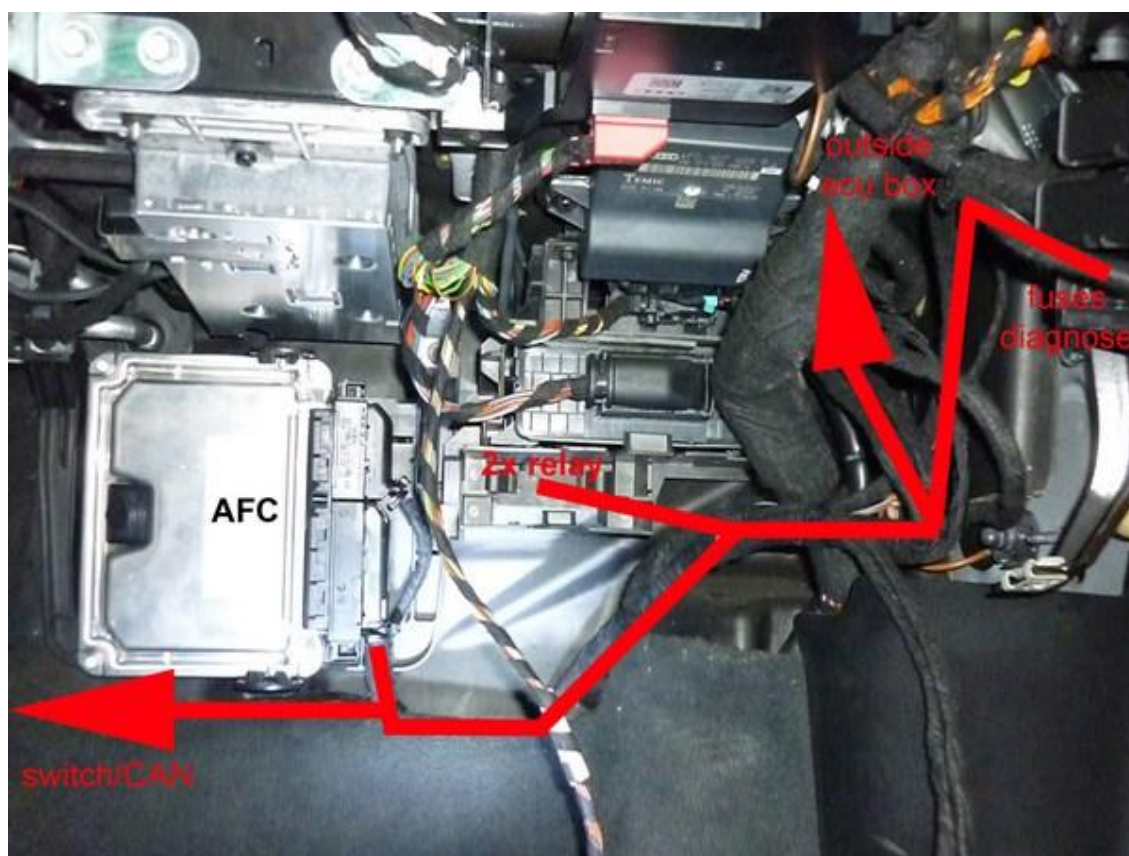


Mounting the AFC

Remove glove compartment.



Wiring AFC / relay location



Fuses / diagnose connector



Wiring routing



Power supply



Adapt petrol ecu box grommet

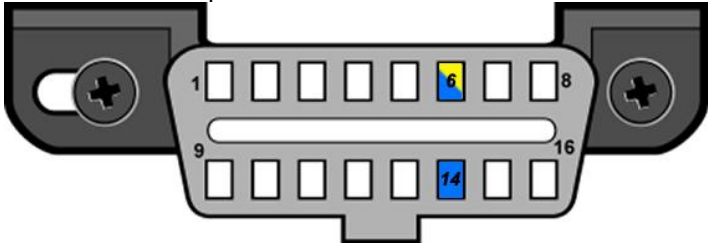


 Mount the switch.

Mounting the fuel selection switch



Driver room

3-pole micro connector			
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.

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 a ring terminal. Wire location : original ground point, near FSU
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 : petrol ecu box
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 : black-purple 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.

Wire number / code	Wire colour	Connection
18 Analog 1 25 Simulation 1	Blue-red Green-grey	High pressure petrol sensor interruption Sensor side. ECU side. Wire colour : black-blue Wire location : petrol ecu, connector T60, pin 59
19 Analog 4	Blue-white	High pressure petrol sensor ground Wire colour : brown-black Wire location : petrol ecu, connector T60, pin 40
121 Wake-up	Red-grey	High pressure petrol sensor 5Volt supply Wire location : blue-red Wire location : petrol ecu, connector T60, pin 29

17 Analog 2 10 Simulation 2	Blue-black Green-black	Low pressure petrol sensor interruption Sensor side. ECU side. Wire colour :lila Wire location : petrol ecu, connector T60, pin 49
115 Digital input 4	Yellow-red	Petrol fuel pump driver (PWM in) Wire colour : red-white Wire location : petrol ecu, connector T90 , pin 35

117 Digital input 3	Yellow-black	insulate
119 Digital input 2	Yellow-grey	insulate
23 Digital Simulation	Green-red	insulate
6 Lambda1 WB	Orange	insulate
42 Lambda2 WB 10KΩ	Orange-white	insulate
97 Digital input 5	Yellow-orange	insulate
113 Digital input 6	Yellow-purple	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
27 +5V sensor 37 C ground 20 Analog 3 MAP*	Red Brown Blue	Cut off connector
* 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 : black Wire location : petrol ecu, connector T60, pin 44
8 RPM	Purple-white	For measuring the engine speed signal. Wire colour : green-black Wire location : petrol ecu, connector T60, pin 25
15 T-ect	Grey	For measuring the engine coolant temperature. Wire colour : black-grey Wire location : petrol ecu, connector T60, pin 43



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

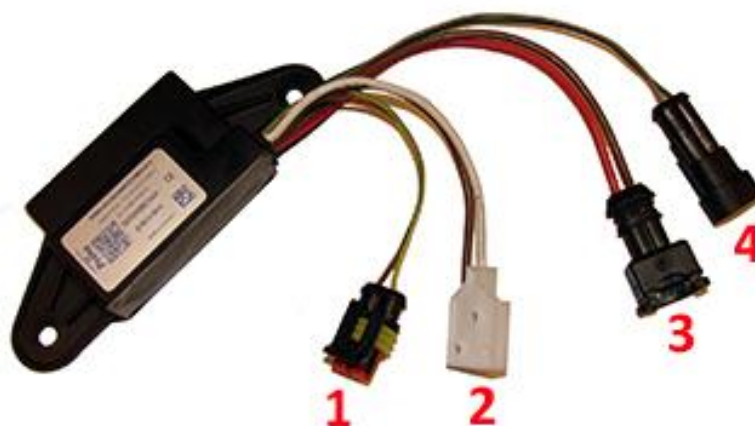


Electrical connections

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. Connector pin 1 Connector pin 2 Connector pin 3
1. 2-pole connector tank lock-off	Green-yellow Brown	Pump driver to lock-off power Pump driver to lock-off ground
2. 3-pole fusite	Red Brown -	1. Pump power 2. Pump ground 3. not used
3. 2-pole connector tank pump	Red 2.5mm ² Brown 2.5mm ²	Pump driver power Pump driver ground
4. 2-pole connector	Grey Green	Pump driver diagnose Pump driver control



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

