

ALTERNATIVE
FUEL SYSTEMS

Prins



Installation manual Dedicated PART 2/2

MANUFACTURER	Seat
TYPE	Ibiza
ENGINE DISPLACEMENT	1400
NUMBER OF VALVES	16
ENGINE CODE / NUMBER	CAVF
VEHICLE CATEGORIES	M
TRANSMISSION	DSG AT
VERSION	Direct LiquiMax-2.0
PETROL ECU MANUFACTURER / CODE	BOSCH MED 17.5.5
HIGH PRESSURE PETROL PUMP	Hitachi Gen 2
HIGH PRESSURE PETROL INJECTOR	Magnetti Marelli IHP-072 / 037C09
MODEL YEAR:	2013
SYSTEM APPROVAL NUMBER (R115)	E4-115R-000010 / DLM-LPG 03
LOCATION SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	361/070003/A
MANUAL NUMBER	076/2101200
DATE	2014-04-03

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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 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 Hitachi	220	46

EXPLANATION OF SYMBOLS :



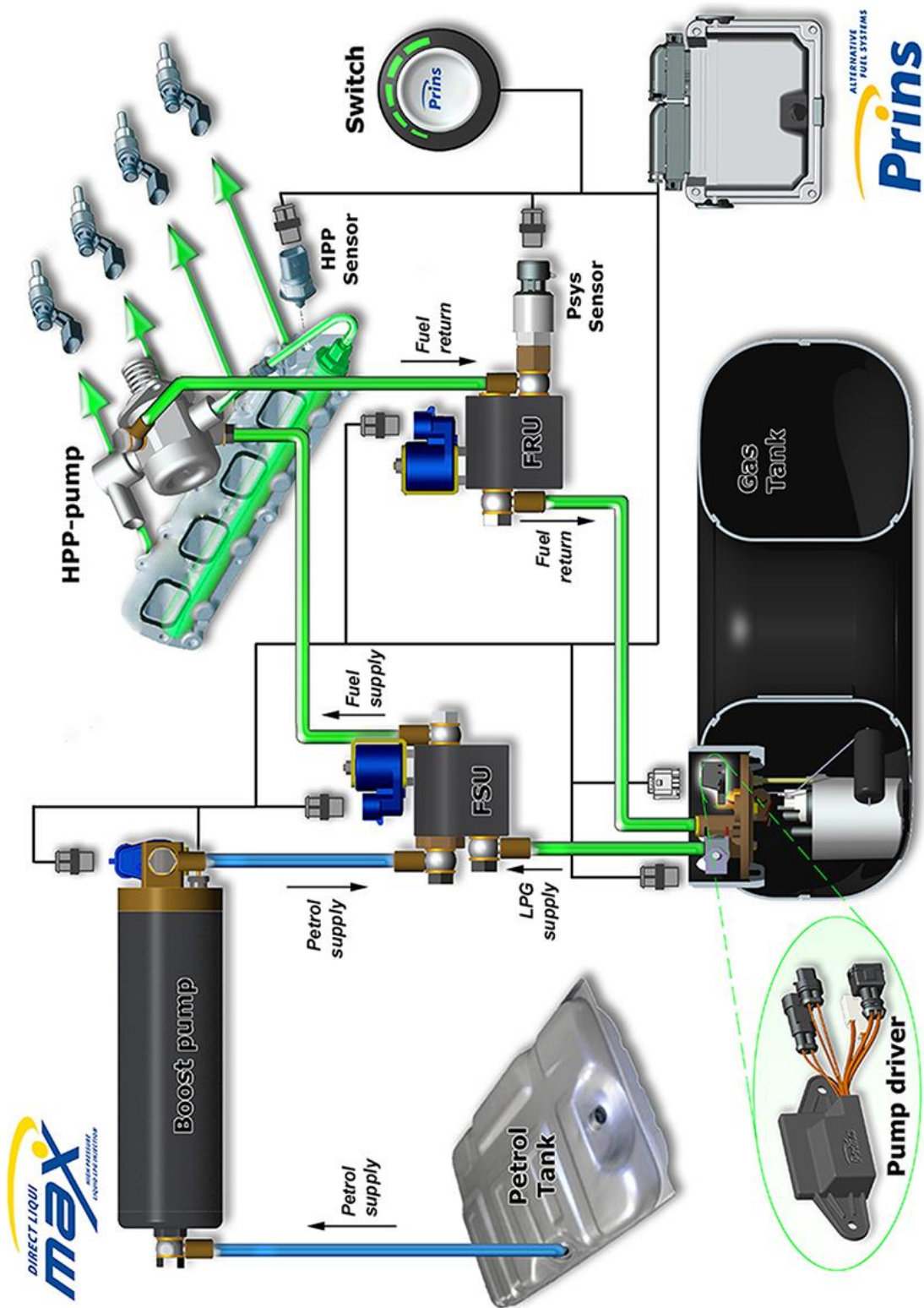
= IMPORTANT,
CAUTION



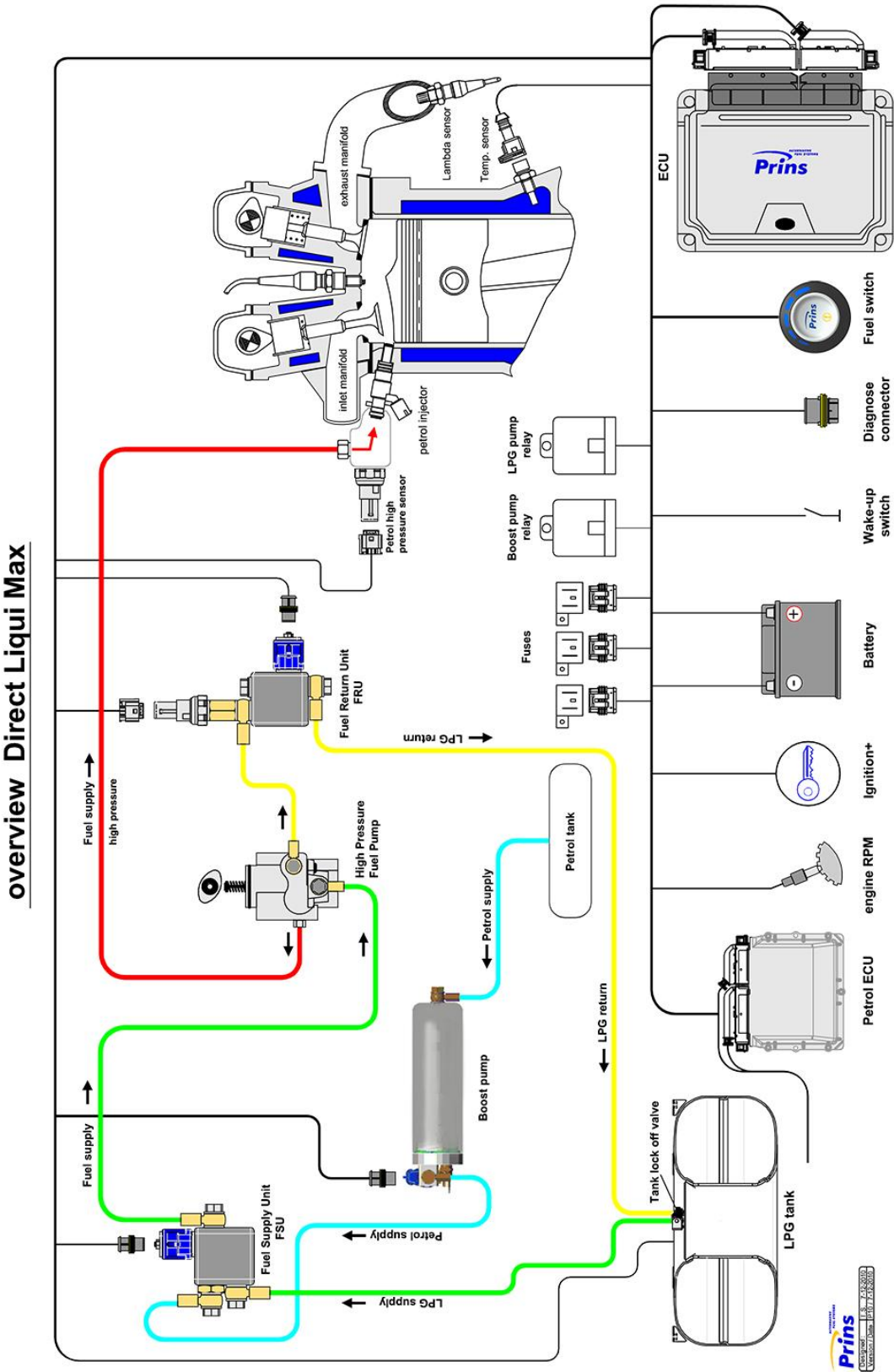
= WEAR SAFETY GOGGLES



Direct LiquiMax



Overview Direct LiquiMax



Direct LiquiMax parts / approval numbers

 1st generation  2nd generation	 1st generation  2nd 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



High pressure pump RETURN connection

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. Reinstall pump.



Tighten cover with 220 Nm



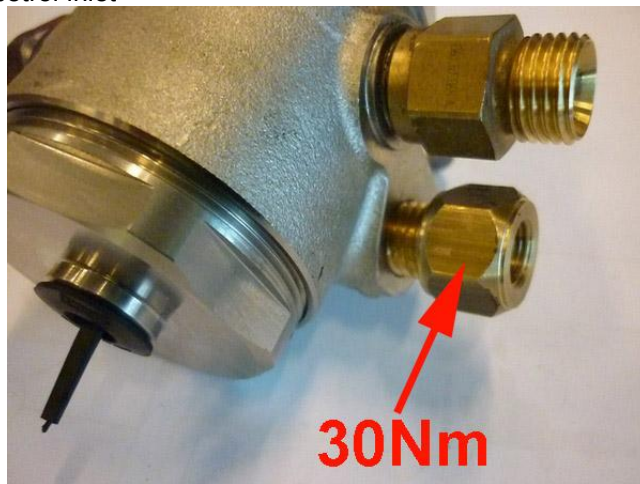
High pressure pump SUPPLY connection



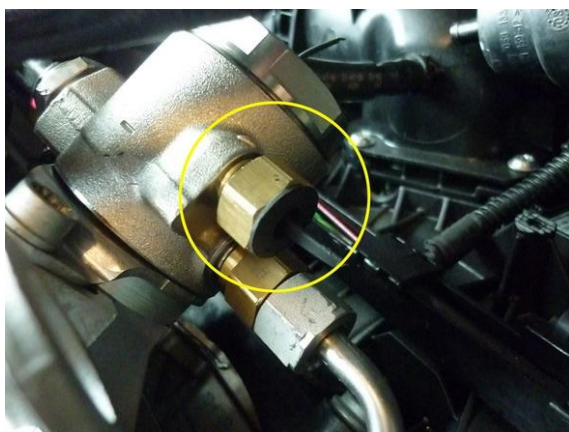
Remove the High petrol pressure pump. Careful : petrol !
(Follow the workshop manual of the car) also see page 4.



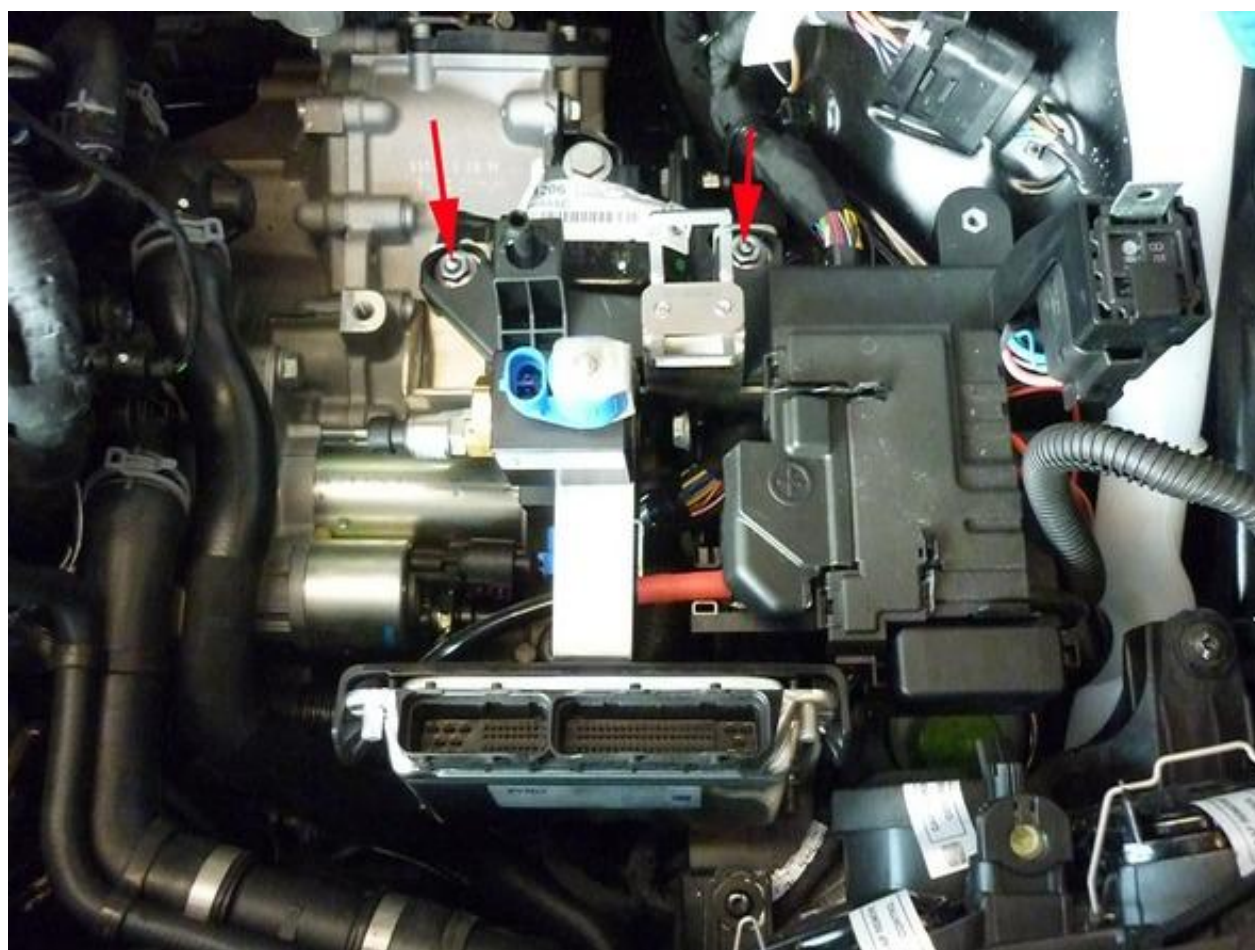
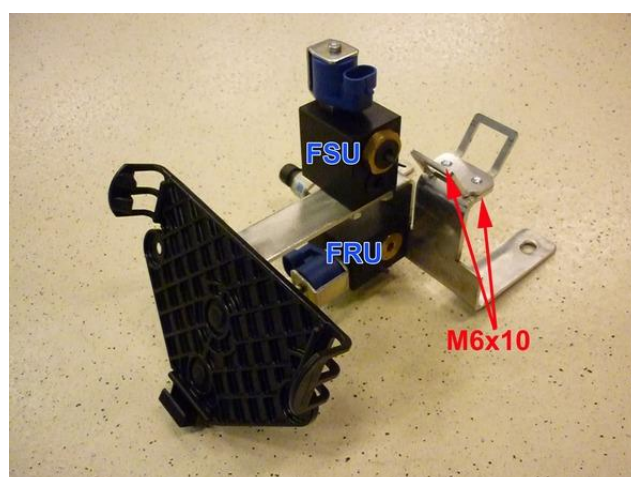
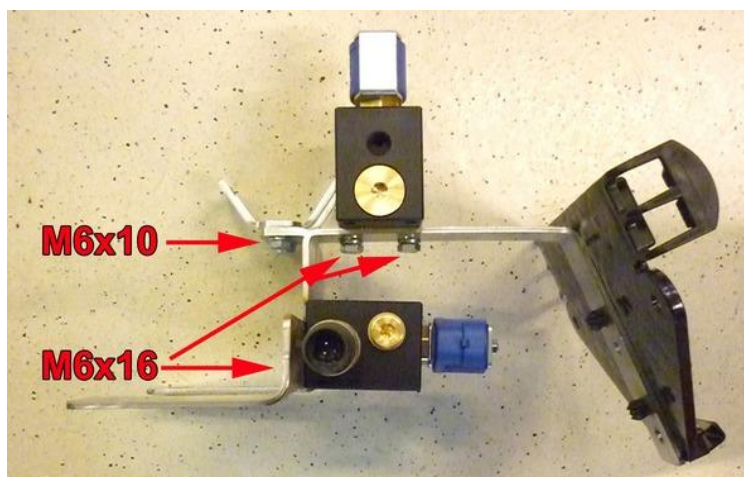
Remove petrol inlet



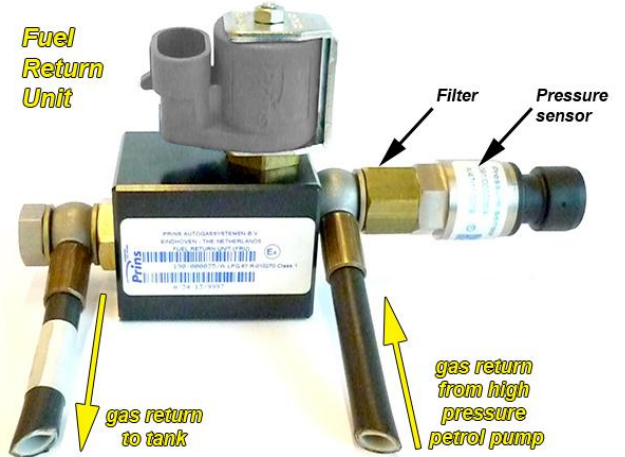
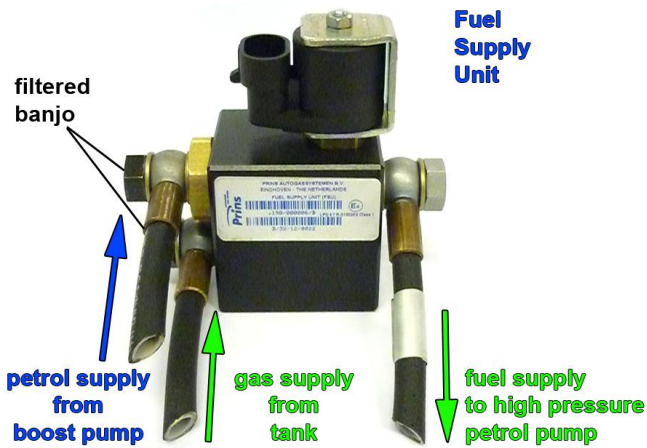
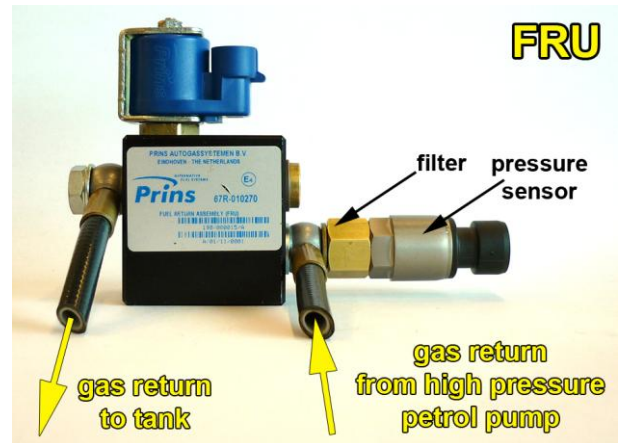
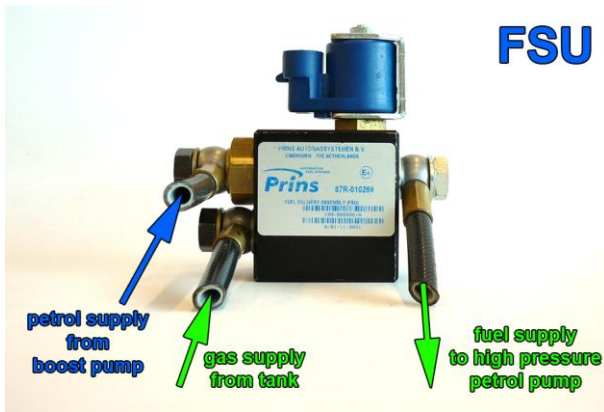
New banjo inlet coupling



System bracket



Fuel Supply Unit / Fuel Return Unit



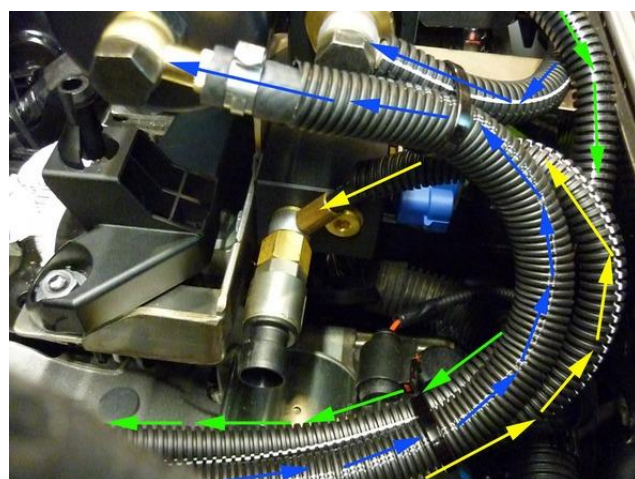
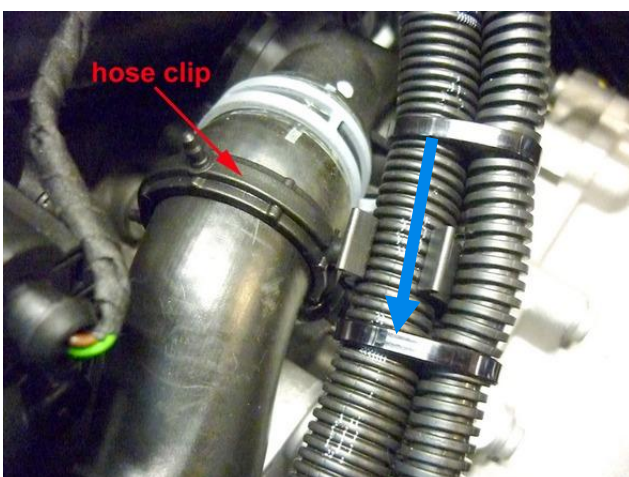
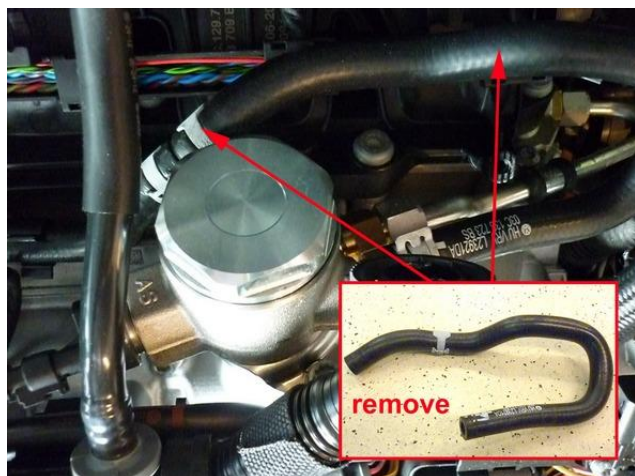
Black filtered banjo will only be used on inlet connections !

Filter inside sensor banjo



Petrol SUPPLY for Boost pump

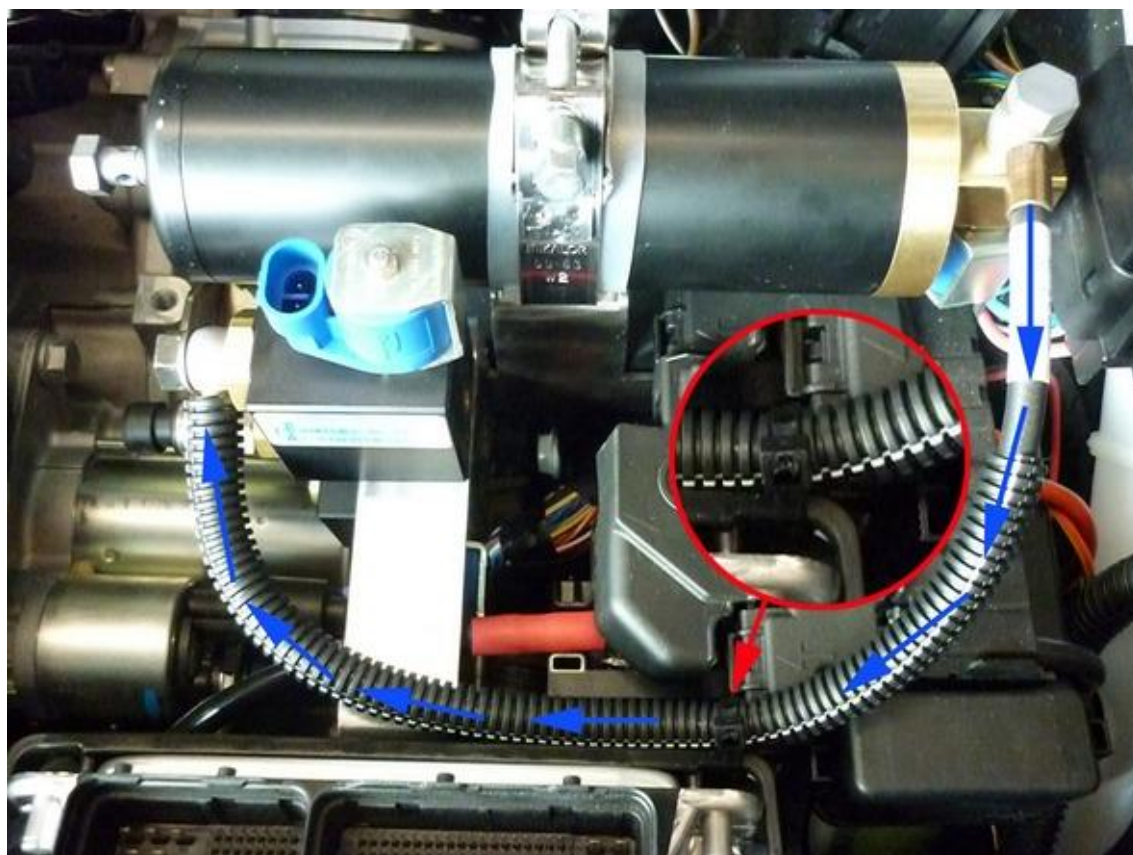
Remove the petrol hose, and install the longer Ø8mm hose (70 cm). Protect the new hose with Split-tube.



Connect the original fuel hose (with a XD-5 banjo eye and 15,3 clamp) to the boost pump.



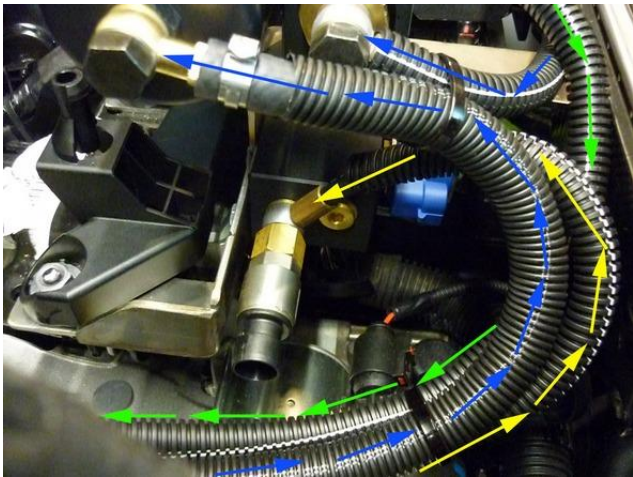
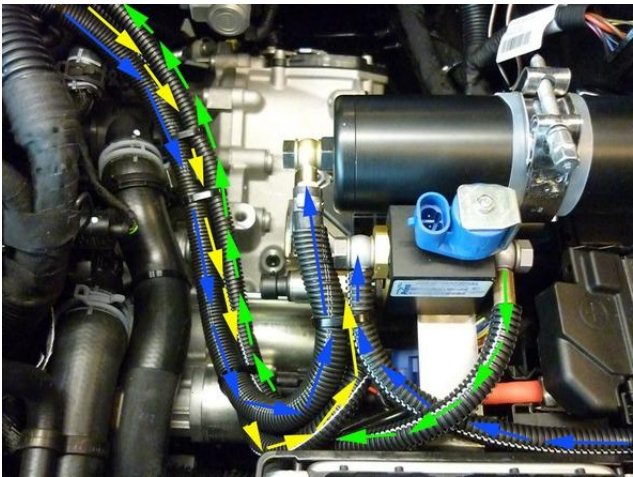
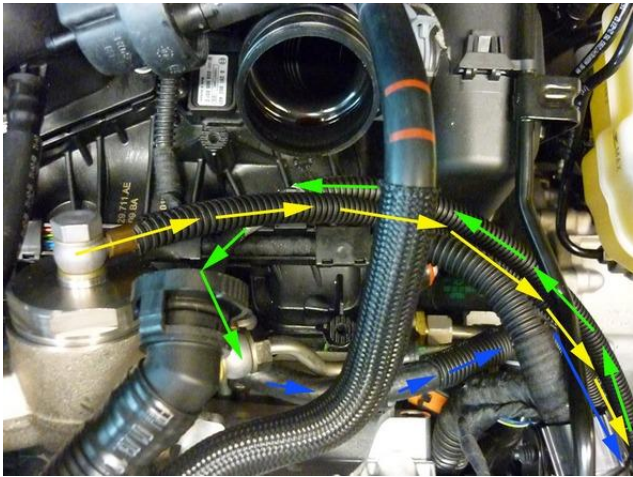
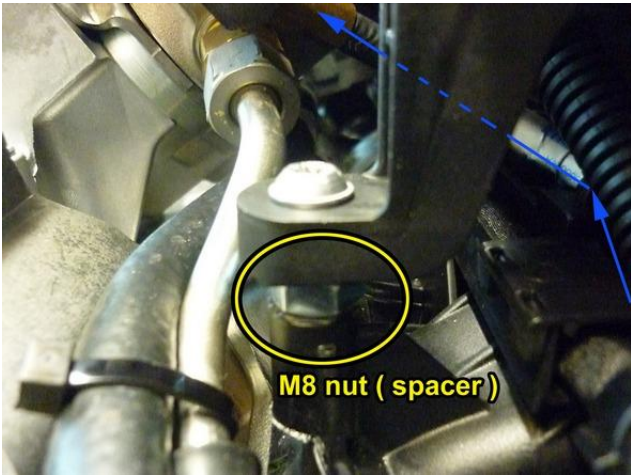
Boost pump to FSU



XD-3, 35cm, banjo-banjo



Fuel RETURN hose



Yellow arrows = return

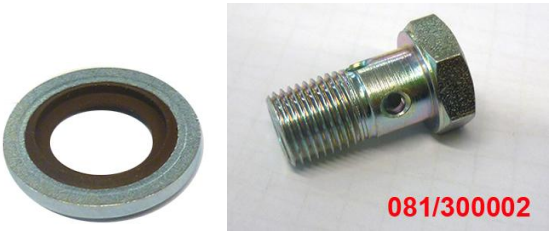


Lpg / petrol fuel lines

Hose	from	to	Length (cm)
Ø8 petrol hose	Adapter original petrol hose	Petrol boost pump	XD-5 banjo eye
XD-3	Fuel supply unit	High pressure petrol pump	75
XD-3	Petrol boost pump	Fuel supply unit	35
XD-3	Fuel return unit	High pressure petrol pump	75



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



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

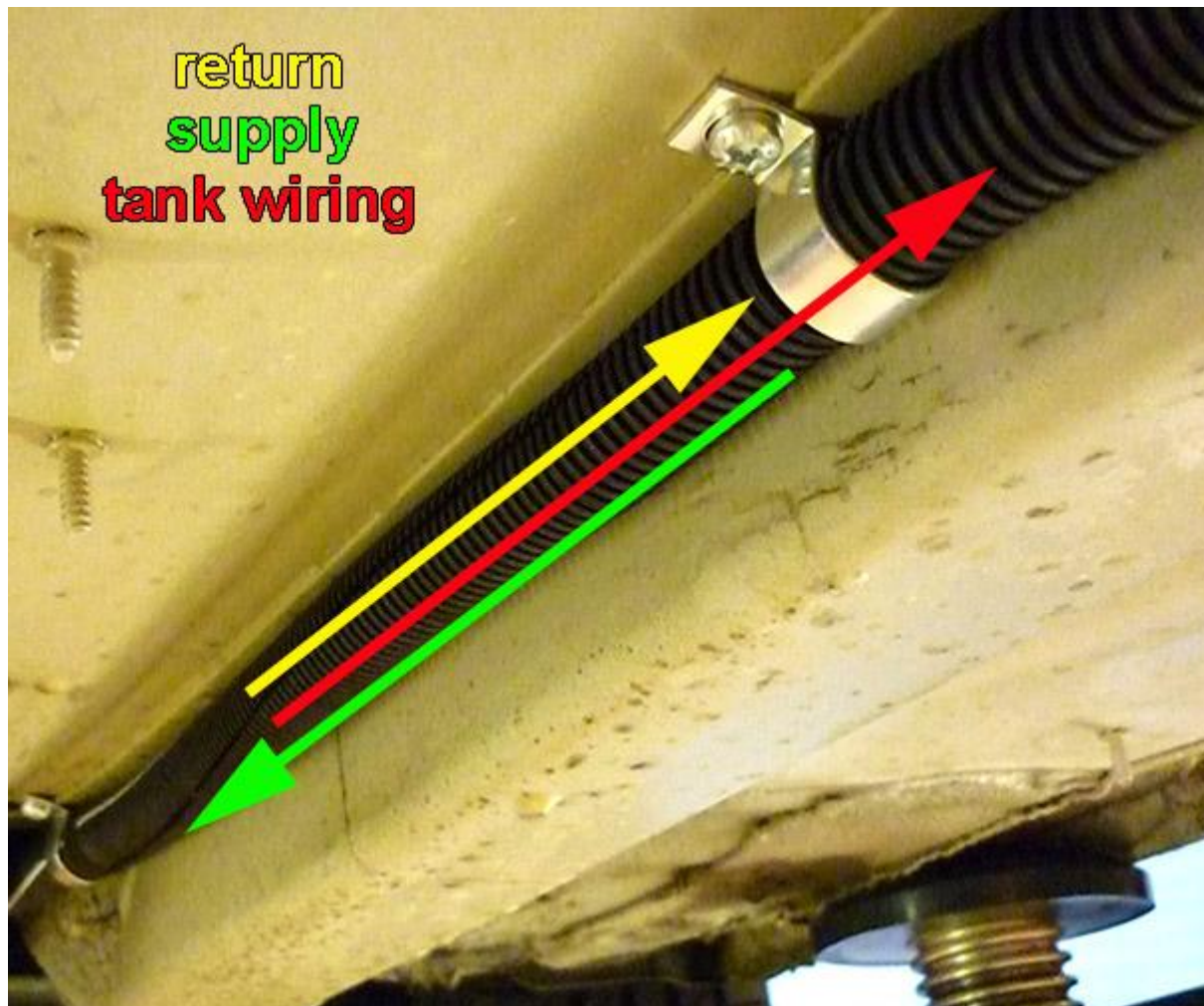


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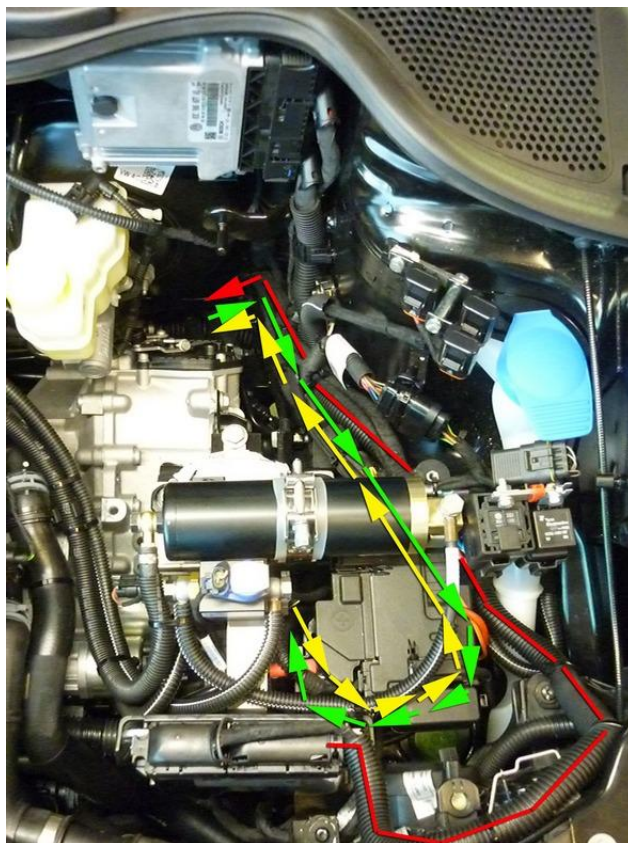


Supply hose – Return hose – Tank wiring

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



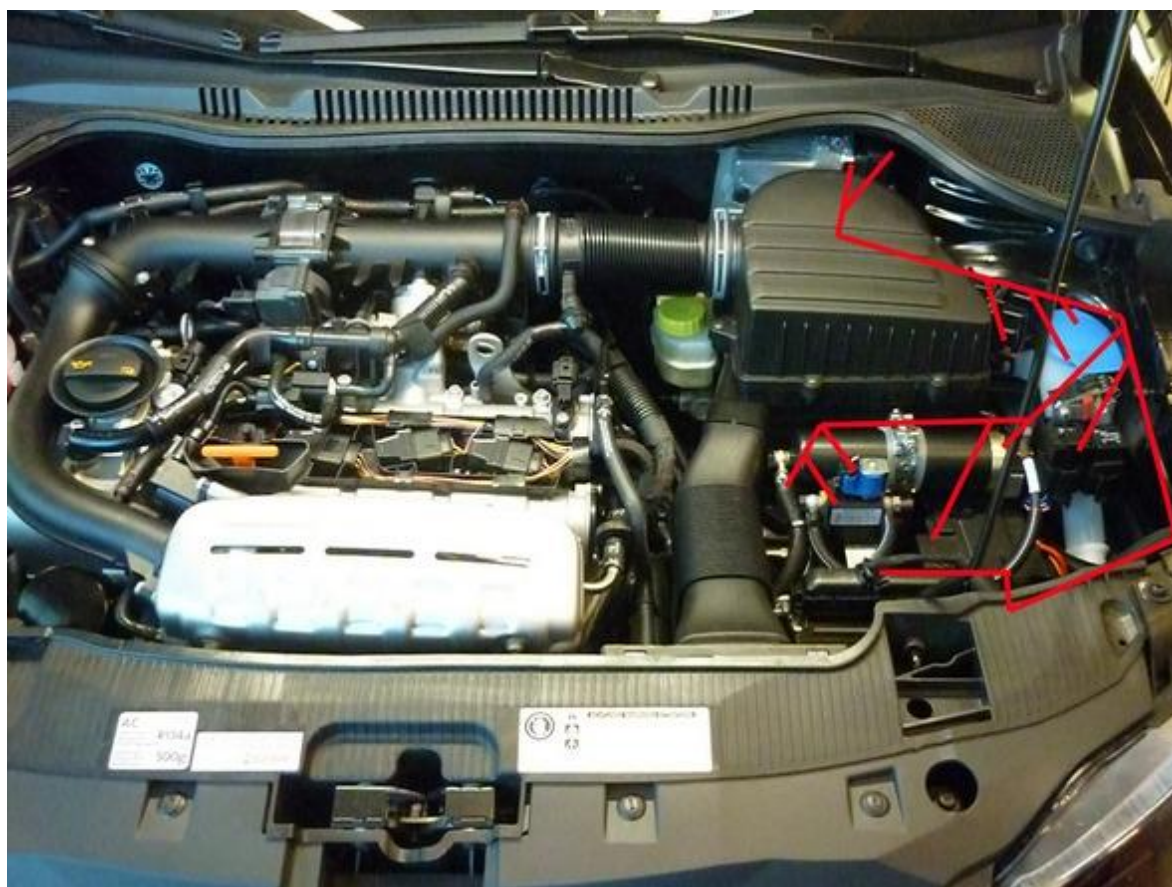
Red = wiring to tank
Yellow = return hose to tank
Green = supply hose from tank
Also see page 28



Mounting the AFC



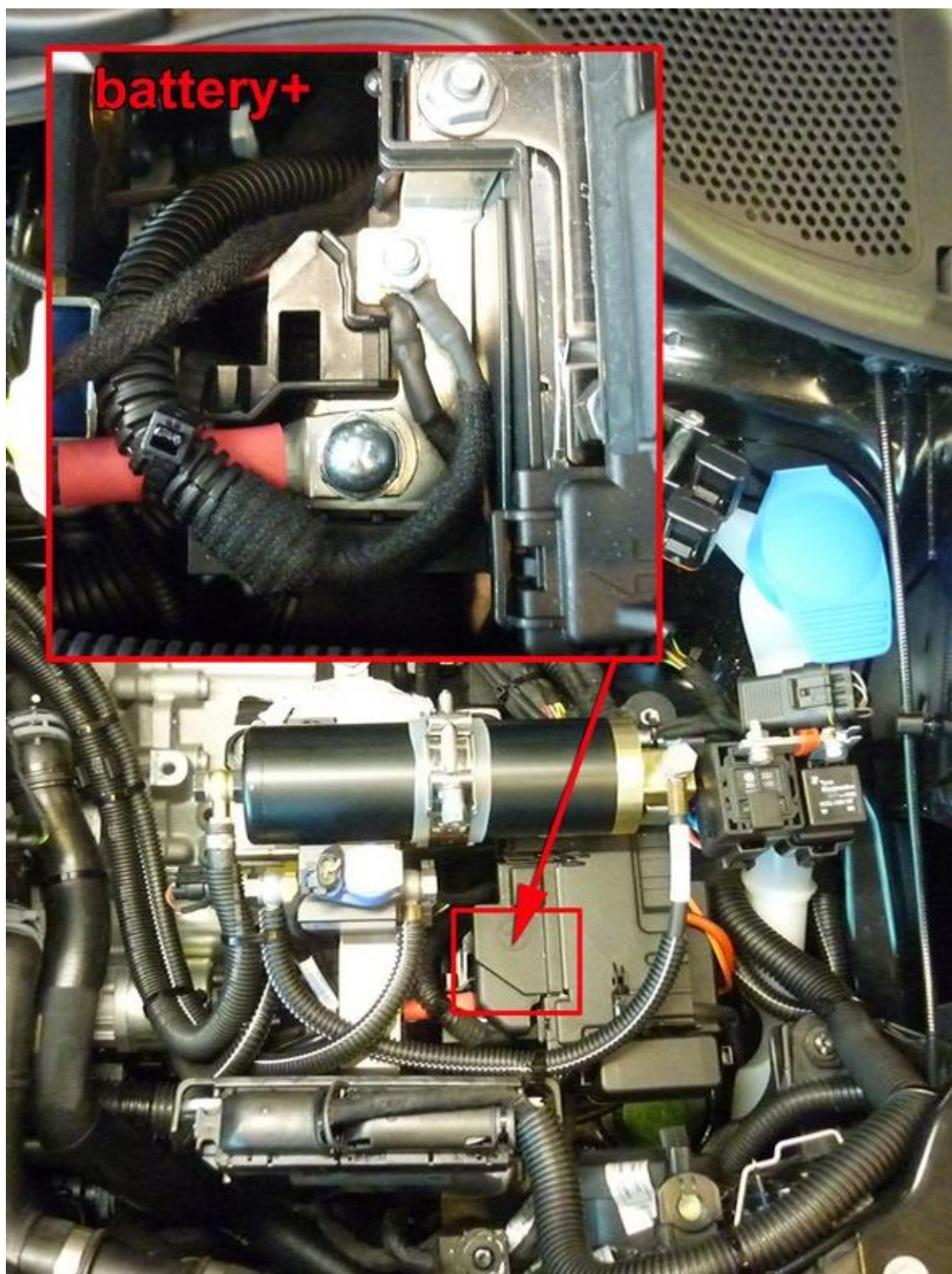
Wiring routing



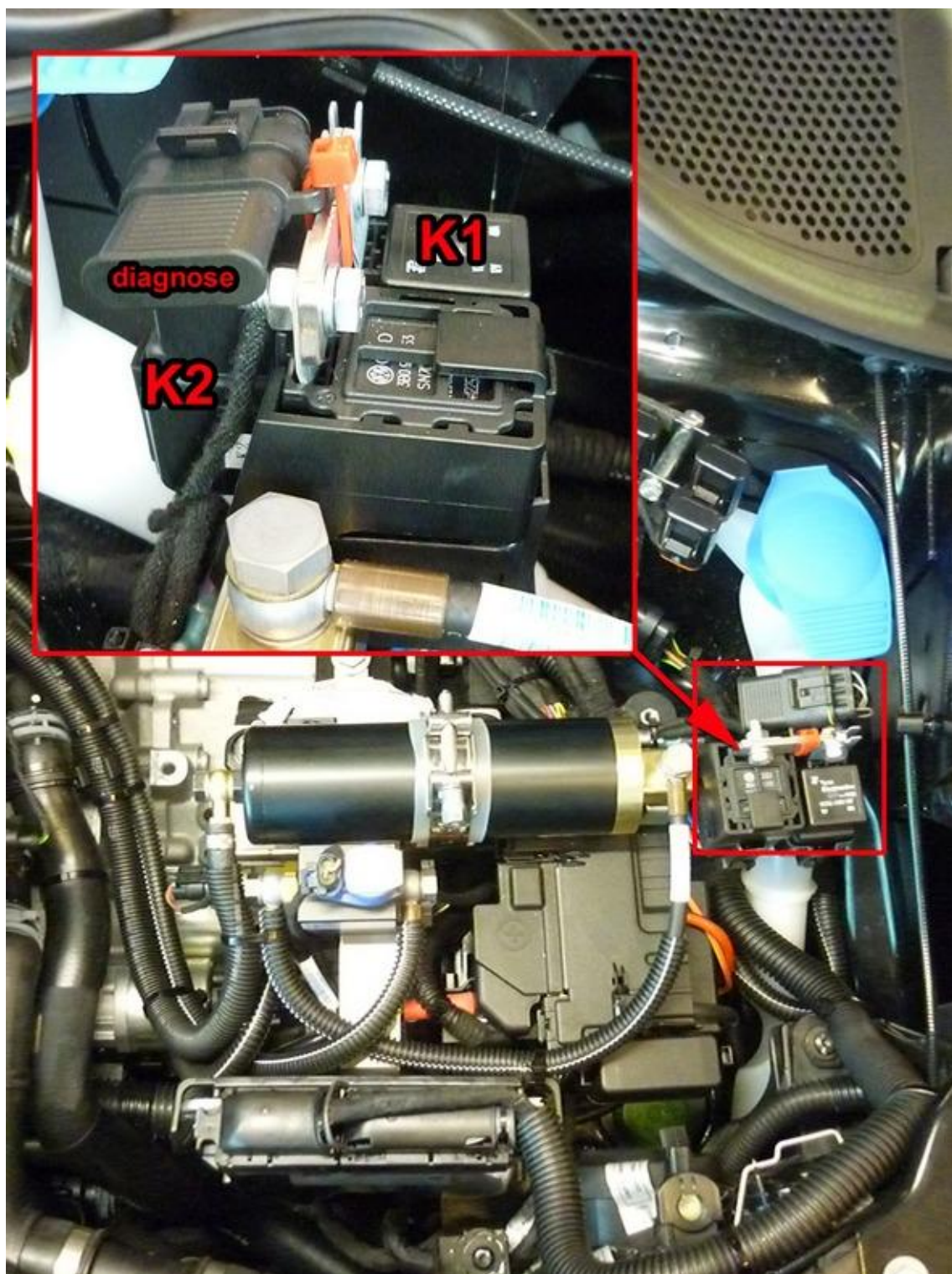
Wiring Ground



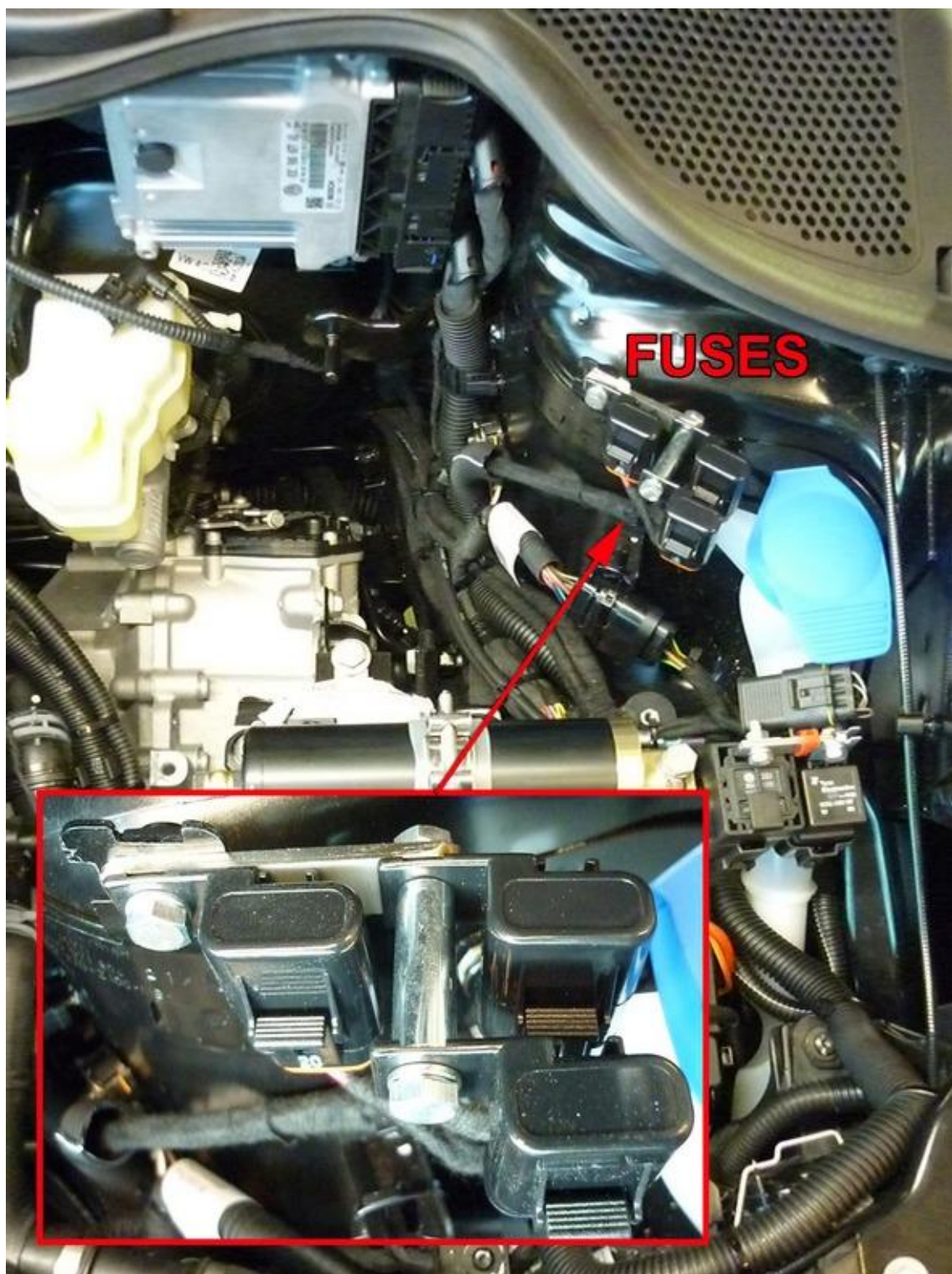
Wiring Battery+12V



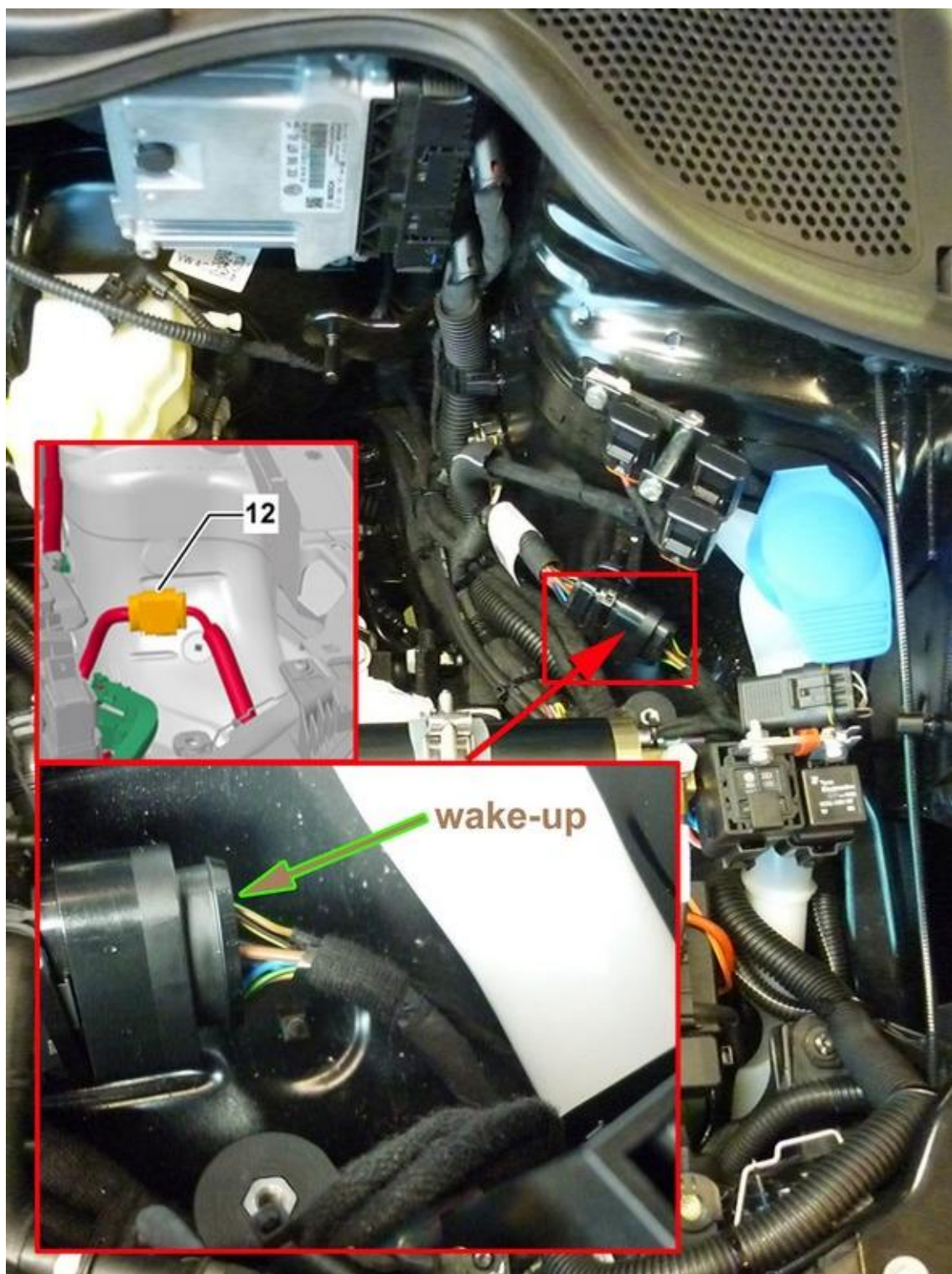
Wiring Relay K1 / K2 and diagnose connector



Wiring Fuses



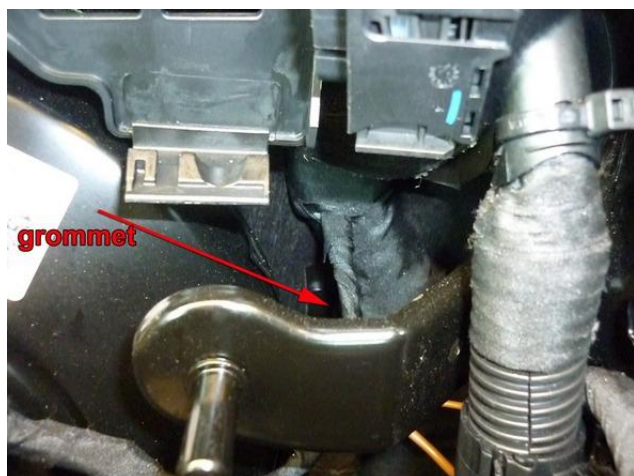
Wiring Wake-Up



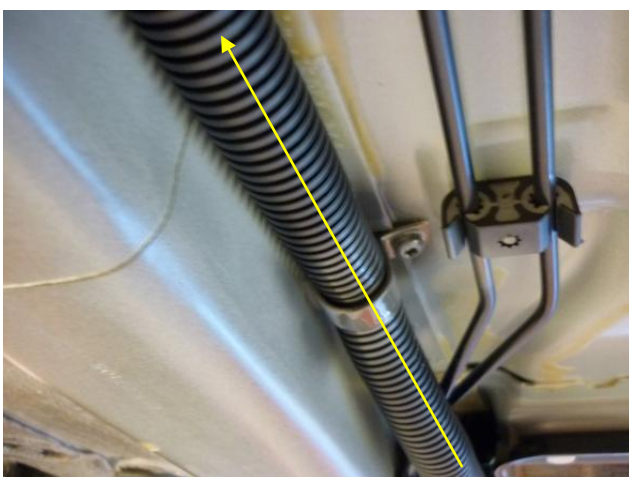
Green-brown, pin 12



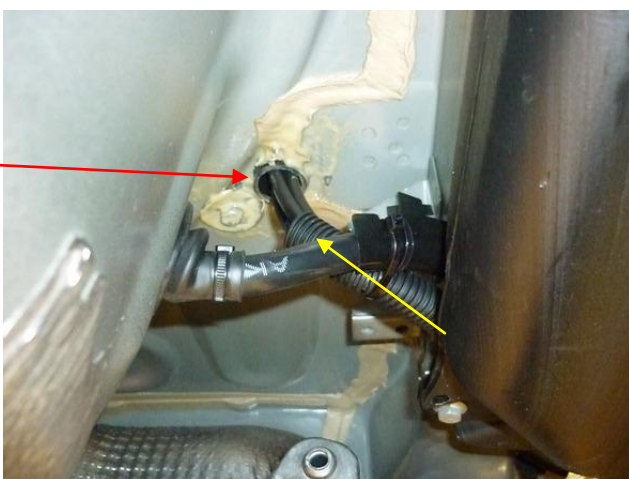
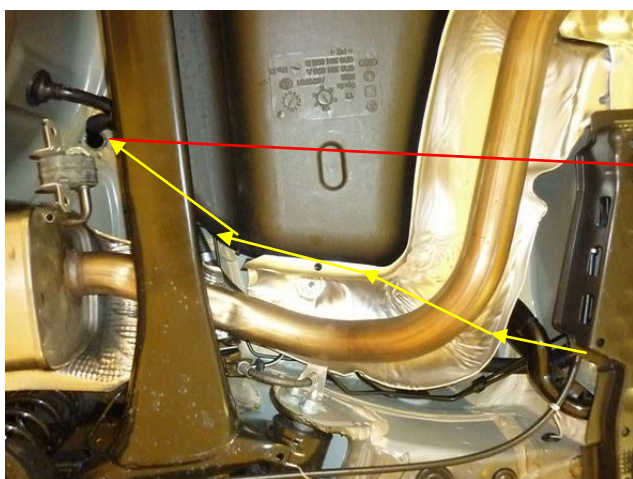
Mounting the fuel selection switch



Hose routing to tank

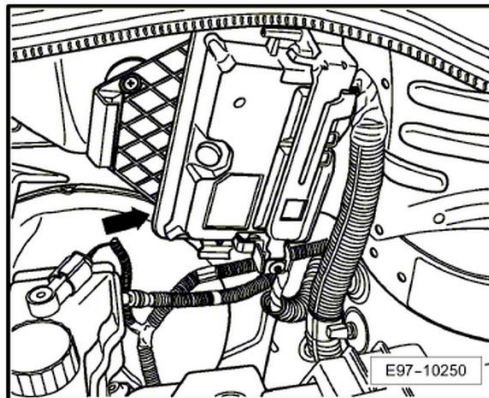


Beware of Battery+ cable IN chassis beam

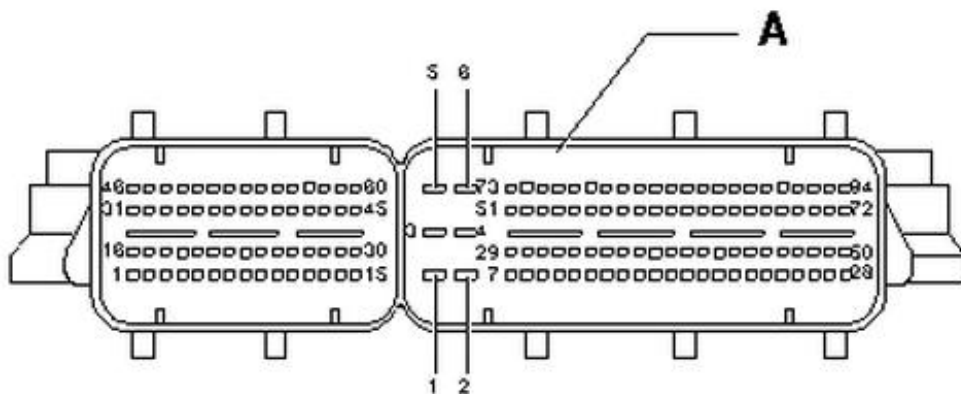


Petrol ECU

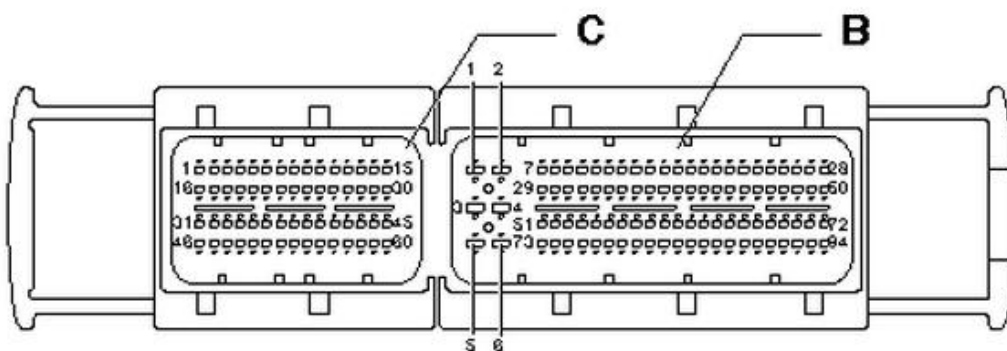
Check and measure the wiring in case of changes in the cars wiring colours.
Insulate not used wires.



A=petrol ecu connector



B=connector T94
C=connector T60



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 :left suspension, ground point See page 22
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. See page 23.
121 Wake-up	Red-grey	Wire colour : green-brown Wire location : left suspension, 14-pole connector, pin 12 See page 26



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
		<i>High pressure sensor petrol interruption</i> Wire colour : yellow-blue Wire location : petrol ecu connector T60 , pin 55
18 Analog 1	Blue-red	Sensor side.
25 Simulation 1	Green-grey	ECU side.

19 Analog 4	Blue-white	<i>High Pressure sensor ground</i> Wire colour : brown Wire location : Petrol ecu, T60 , pin 13
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117 Digital input 3	Yellow-black	<i>5 Volt HPP sensor supply</i> Wire colour : black-brown Wire location : petrol ecu connector, T60 , pin 29
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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 : grey or black-grey Wire location : petrol ecu connector T94 , pin 87
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17 Analog 2	Blue-black	<i>Intake air temperature</i> Wire colour : white Wire location : petrol ecu connector T60 , pin 42
-------------	------------	---

10 Simulation 2	Green-black	insulate
23 Digital Simulation	Green-red	insulate
115 Digital input 4	Yellow-red	insulate
119 Digital input 2	Yellow-grey	insulate
6 Lambda1 WB	Orange	Wire location :insulate
42 Lambda2 WB 10KΩ	Orange-white	Wire location :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 Red:insulate Brown:insulate Blue	Cut off connector. For measuring the inlet manifold pressure from the engine MAP sensor. Wire colour : YELLOW-BLUE Wire location : petrol ecu connector T60 pin 55
8 RPM	Purple-white	<i>For measuring the engine speed signal.</i> Wire colour : WHITE-BROWN Wire location : petrol ecu connector T60 pin 36
15 T-ect	Grey	<i>For measuring the engine coolant temperature.</i> 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>		Connect the 2-pole connector to the lock-off valve of the Boost Pump.
106 + Lock-off Boost Pump	Red White-yellow	
98 Ground lock-off		
<i>2-pole connector FSU</i>		Connect the 2-pole connector to the lock-off valve of the Fuel Supply Unit
108 + Lock-off FSU	Red Pink-yellow	
100 Ground lock off		
<i>2-pole connector FRU</i>		Connect the 2-pole connector to the lock-off valve of the Fuel Return Unit
90 + Lock-off FRU	Red 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>		Pin 86 of the boost pump relay
107 + relay boost pump	Red Green-yellow	Pin 85 of the boost pump relay
99 GND relay boost pump	Red	Pin 30 of the boost pump relay
+12V fused BATT	Red	Pin 87 of the boost pump relay
+12V Boost pump		

Driver room

<i>3-pole micro connector</i>		Connect the 3-pole connector to the Prins fuel selection switch.
66 Ground fuel switch	Brown	
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

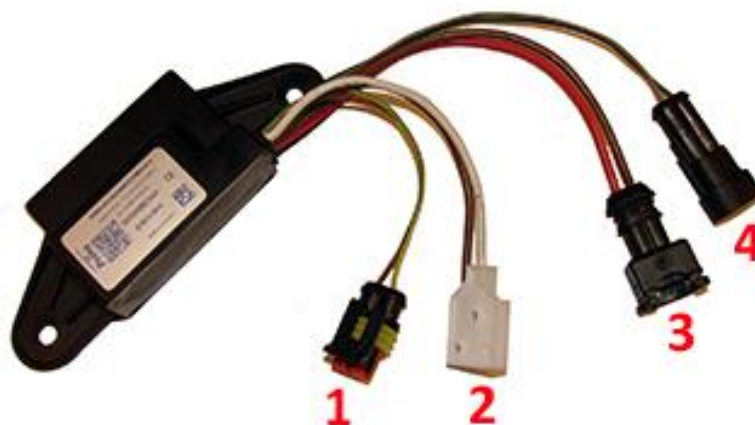


Electrical connections

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. 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.

