



**Installation manual  
Dedicated  
PART 2/2**



MANUFACTURER  
TYPE  
ENGINE DISPLACEMENT  
NUMBER OF VALVES  
ENGINE CODE / NUMBER  
VEHICLE CATEGORIES  
TRANSMISSION  
VERSION  
PETROL ECU MANUFACTURER / CODE  
HIGH PRESSURE PETROL PUMP  
HIGH PRESSURE PETROL INJECTOR  
MODEL YEAR:  
SYSTEM APPROVAL NUMBER ( R115 )  
LOCATION SYSTEM STICKER  
ENGINE SET NUMBER  
MANUAL NUMBER  
DATE

NISSAN  
QASHQAI  
1200cc  
16v  
HRA2  
M  
MT  
AFC-2.1  
Continental EMS3155  
Denso 166304016R  
Denso 4350R-0060  
2014  
E4-115R-000013 / DLM-LPG 06  
right side, centre door post  
356/070005/A  
076/1602100  
2015-06-19



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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 / 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 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
- 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 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

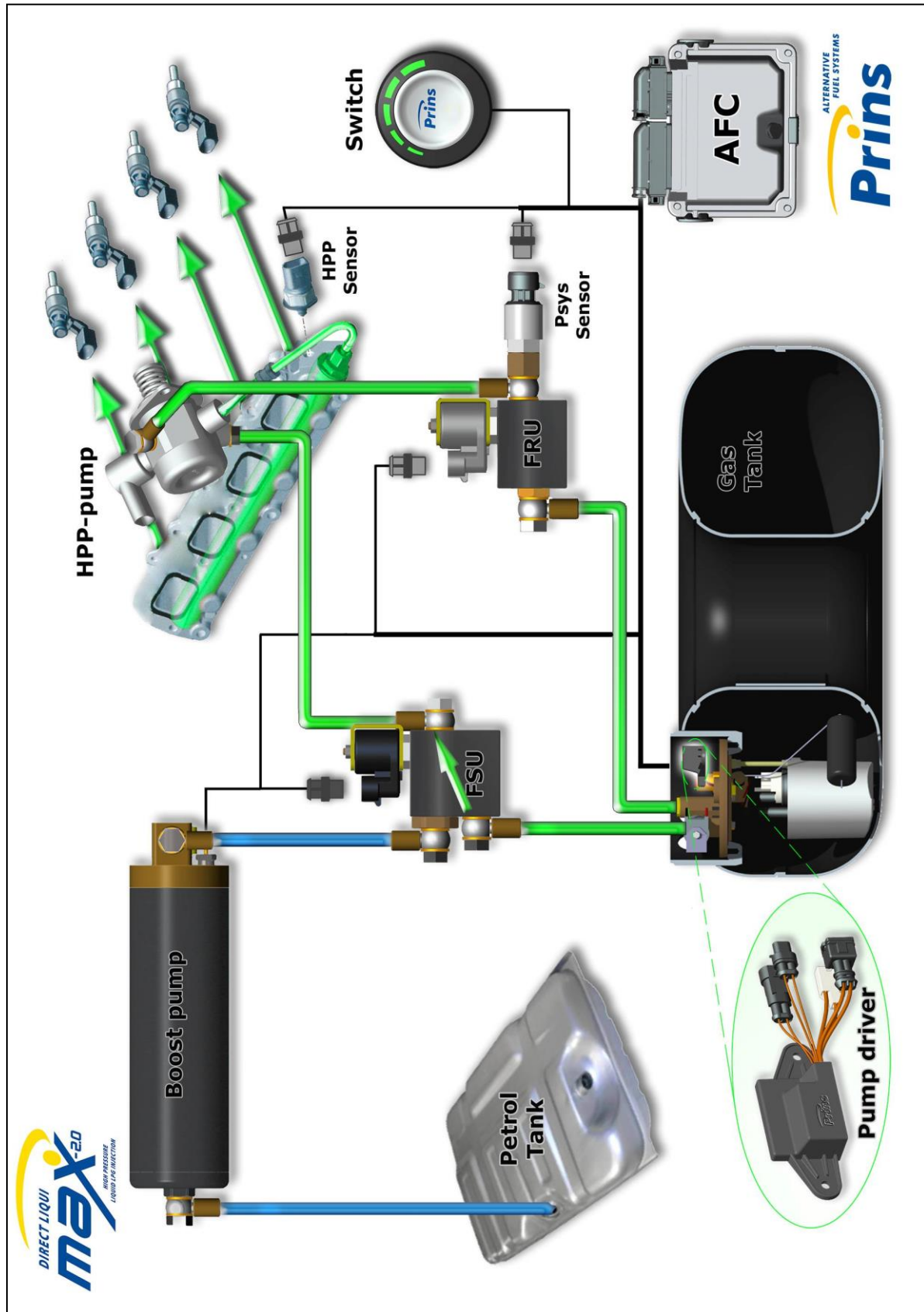


= WEAR SAFETY GOGGLES



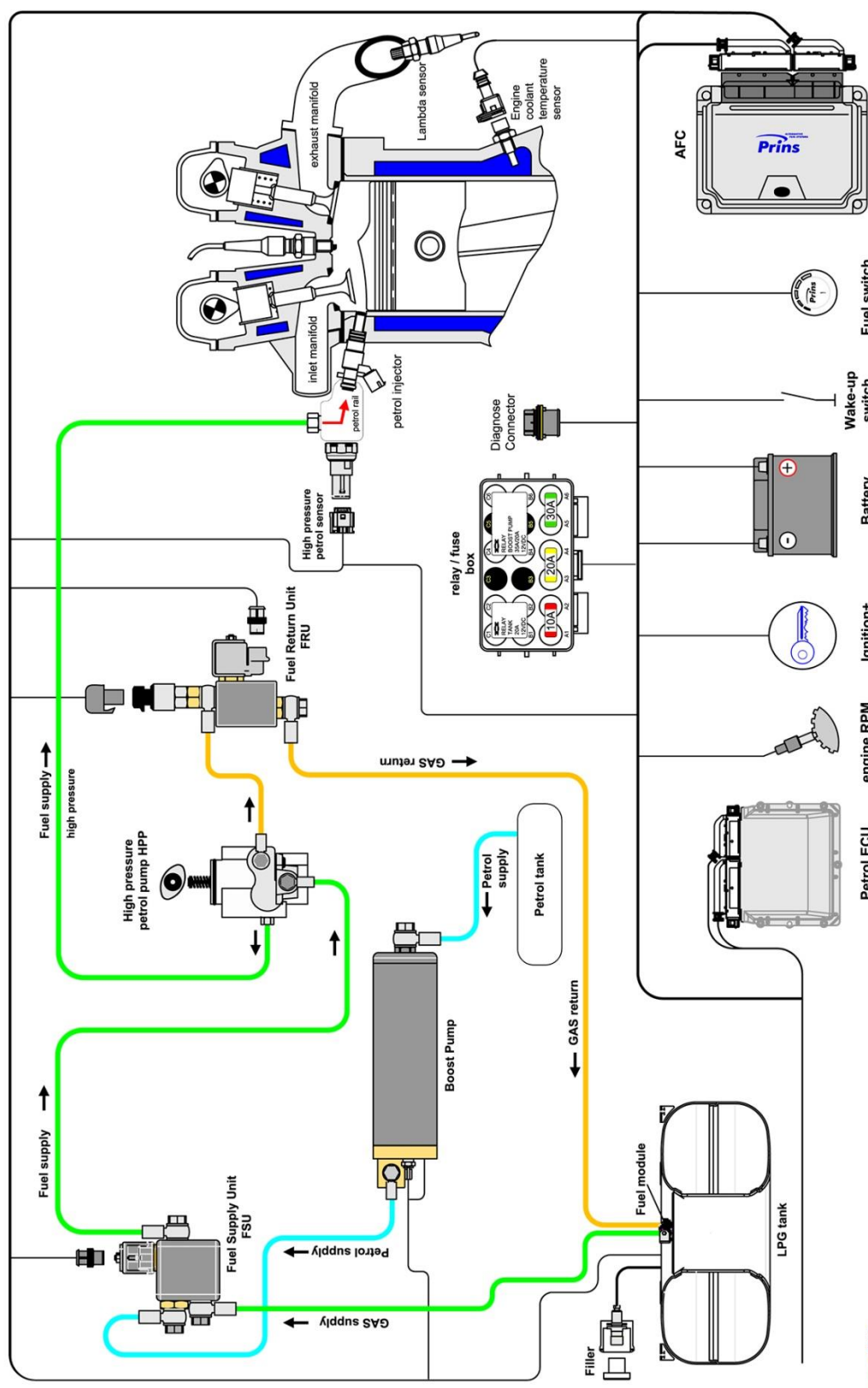


## Direct LiquiMax-2.0, AFC-2.1



## Direct LiquiMax-2.0 diagram, AFC-2.1

## overview Direct LiquiMax-2.1





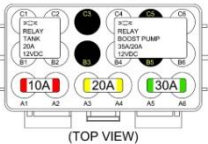





## Direct LiquiMax parts / approval numbers


 <p>1<sup>st</sup> generation</p>  <p>2<sup>nd</sup> generation</p>	 <p>1<sup>st</sup> generation</p>  <p>2<sup>nd</sup> 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 component location overview

<p><b>HPP pump</b></p> 		<p><b>System Fuses</b></p> 
<p><b>FSU</b></p> 		<p><b>AFC</b></p> 
<p><b>FRU</b></p> 		<p><b>Petrol ECU</b></p> 
<p><b>Boost pump</b></p> 		

	<p>R115 approval sticker : Right side centre door post</p>
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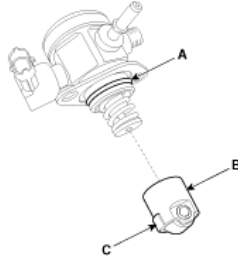
## Installation of the Bosch High Pressure Petrol Pump

### 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 petrol pump installation bolt:** 12.8 ~ 14.7 N.m

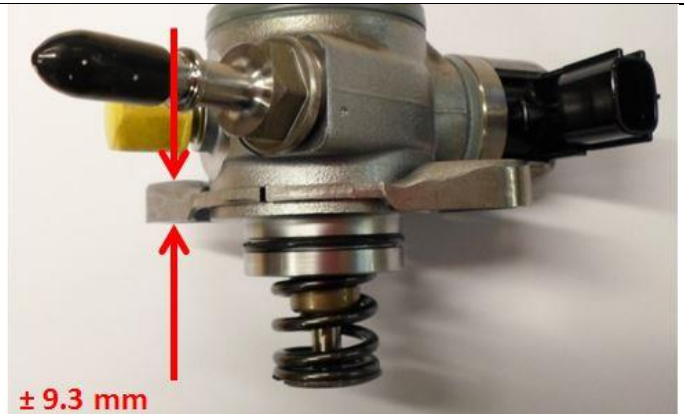
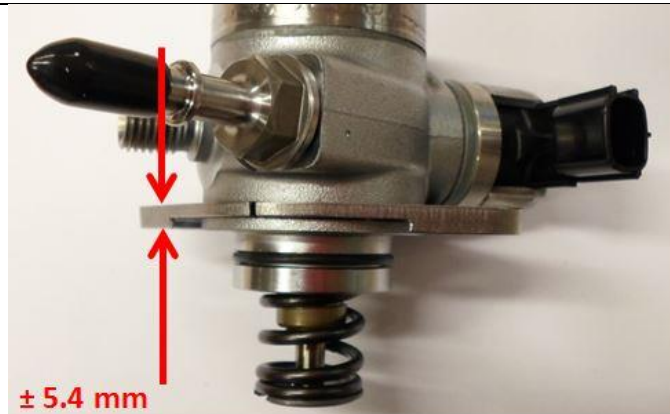
### Petrol pipe:

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. **Mount the new fuel line free of tension.**

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

Installation is reverse of removal.



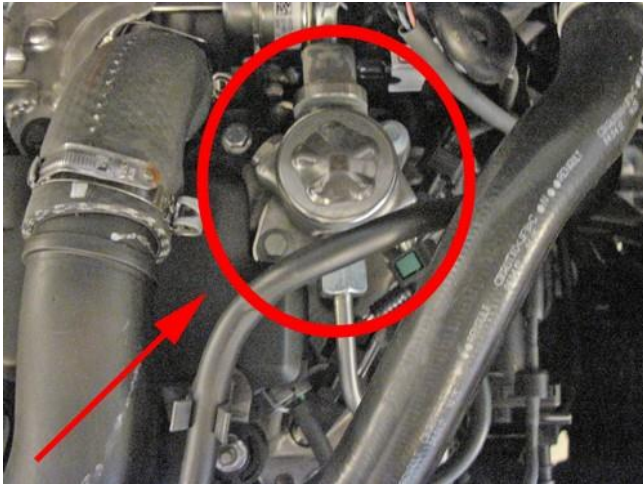
*It's possible that the new high pressure pump has another thickness of the mounting plate. This deviation in thickness needs your attention and requires an adaption of the mounting bolts. When the new mounting plate has the same thickness as the original, use the original bolts. When the new mounting plate is thicker as the original, use the longer supplied bolts and when the new mounting plate is thinner as the original plate use the shorter supplied bolts. Always check if the new high pressure pump is mounted properly!!*



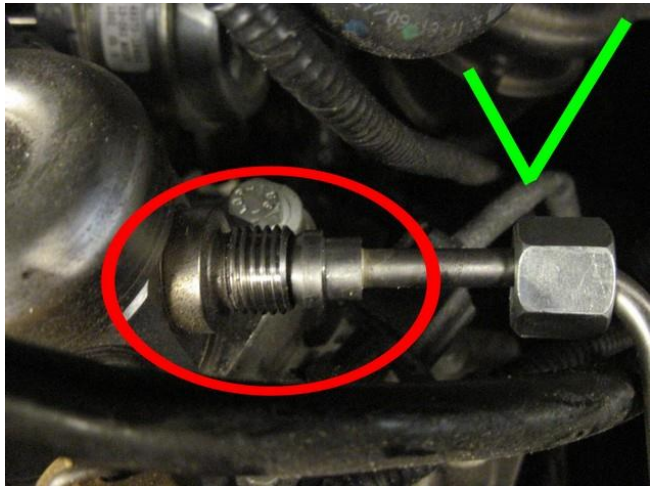
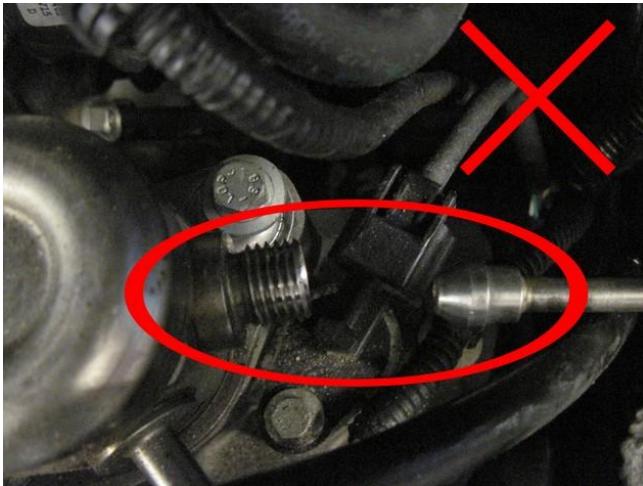




## High pressure pump / Fuel line installation



Replace the High Pressure Pump. Replace the Fuel Line between HP pump and petrol injector rail.  
For easier mounting of the new fuel line, remove the throttle body.



Mount the new fuel line between HP pump and petrol injector rail.

**Mount the new fuel line free of tension. If the fuel line does not fit correctly, adapt the fuel line.**



Mount the new fuel line between HP pump and petrol injector rail. Adapt bracket to fit around fuel line (with bracket).

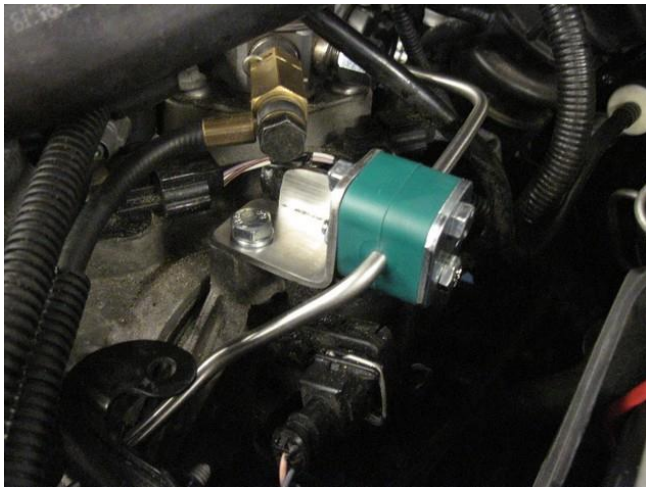




## Fuel line installation 2 / Connector



. Mount the fuel line support bracket with clamp to the fuel line.



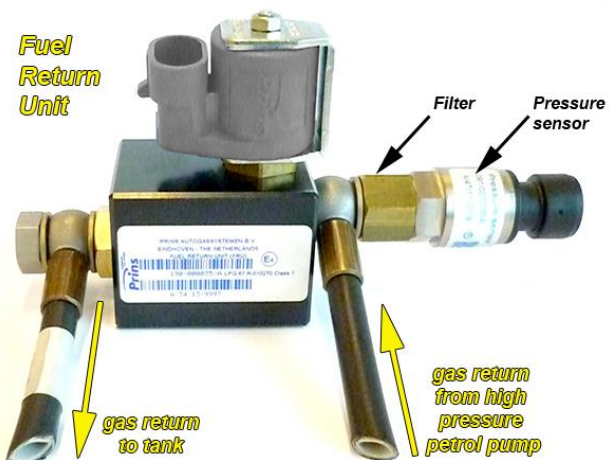
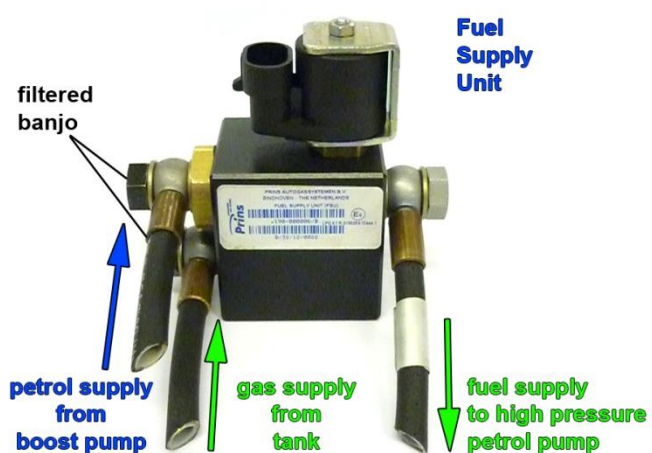
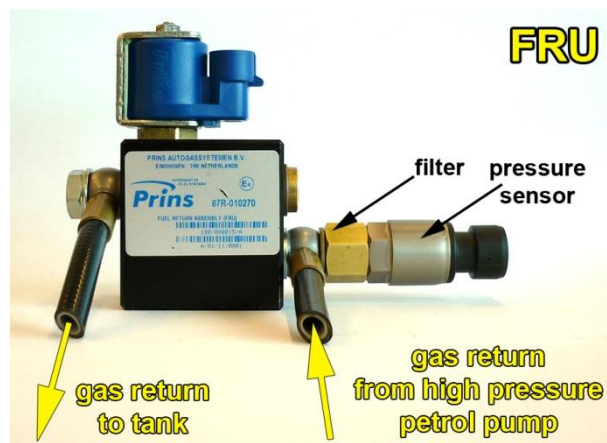
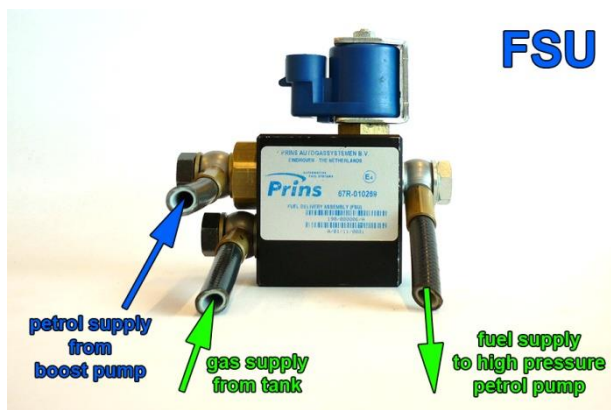
Mount bracket onto engine, also free of tension.



Extend the original wiring by cutting of the original connector. Extend the wiring and connect the new connector. Connect pin 1 from the old connector to pin 1 from the new connector. Mount connector to new HP pump.



## Fuel Supply Unit / Fuel Return Unit



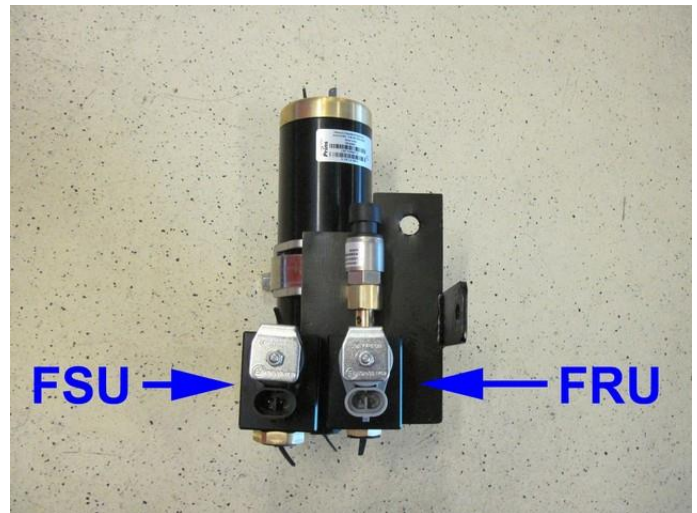
**Black filtered banjo will only be used on inlet connections !**

**Filter inside sensor banjo**





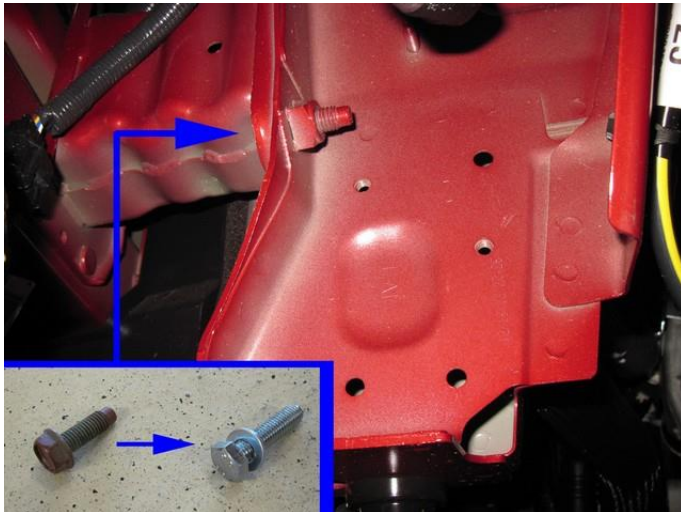
## Mounting the FSU / FRU / Boost pump 1



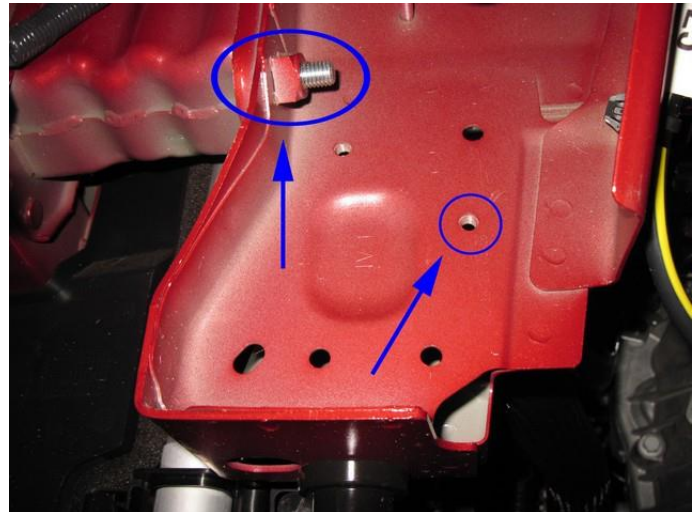
Mount the FSU, FRU and Boost pump to the bracket.



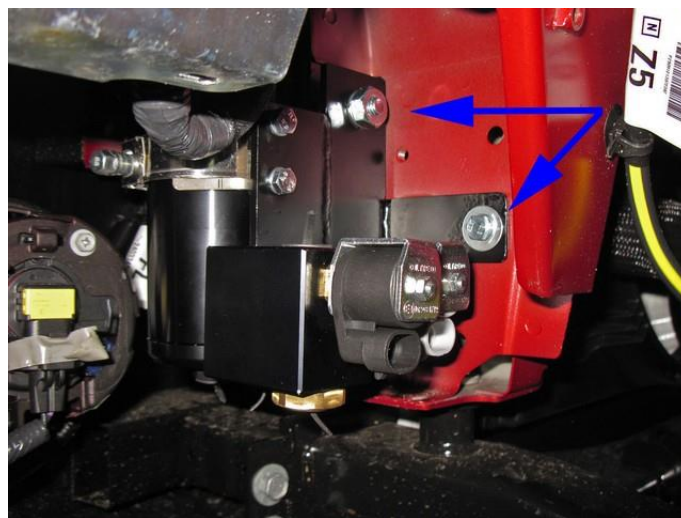
## Mounting the FSU / FRU / Boost pump 2



Replace the original bolt with the new supplied M10 bolt & washer.



Mounting points.



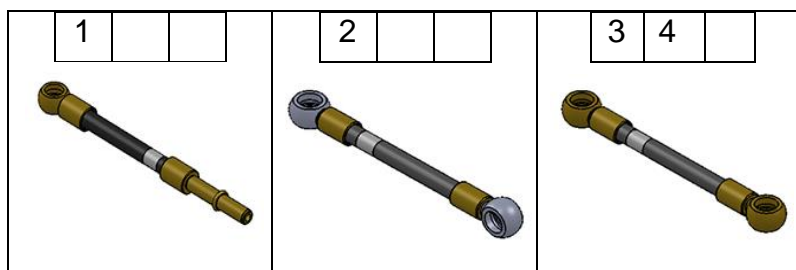
Mount the bracket with FSU, FRU & boost pump mounted.





## LPG / petrol fuel lines

	Hose	From	to	Length ( cm )
1	XD-4	Adapter original petrol hose	Petrol boost pump	95
2	XD-3	Petrol boost pump	Fuel Supply Unit	35
3	XD-3	Fuel Supply Unit	High pressure petrol pump	110
4	XD-3	High pressure petrol pump	Fuel Return Unit	110



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



081/300002

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



181/300009/A

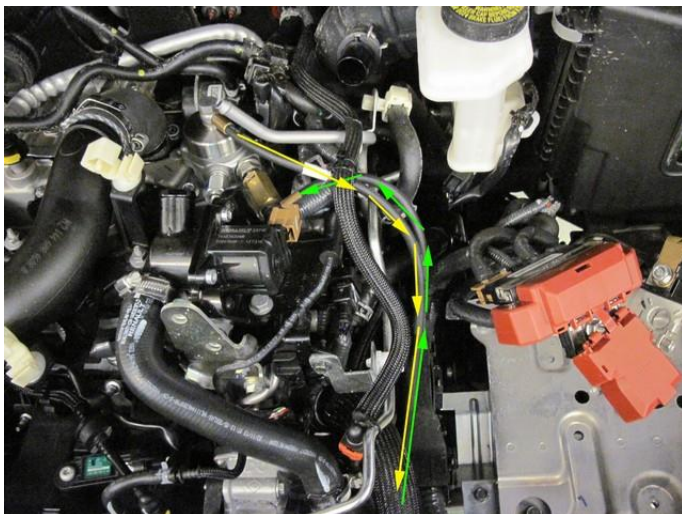




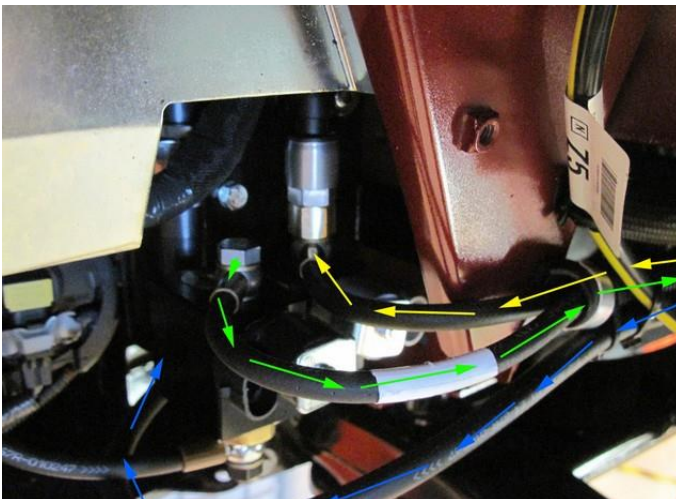
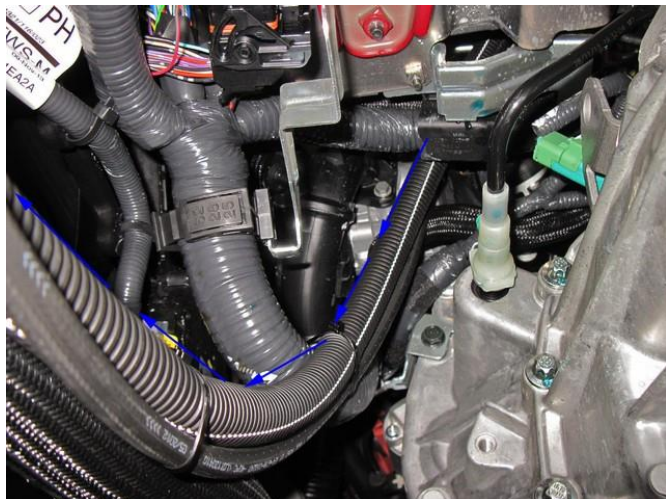


## Hose routing from HP pump to FSU & FRU

Mount quick release to high pressure fuel pump.



Mount hoses from high pressure pump to FSU & FRU. Mount protection.



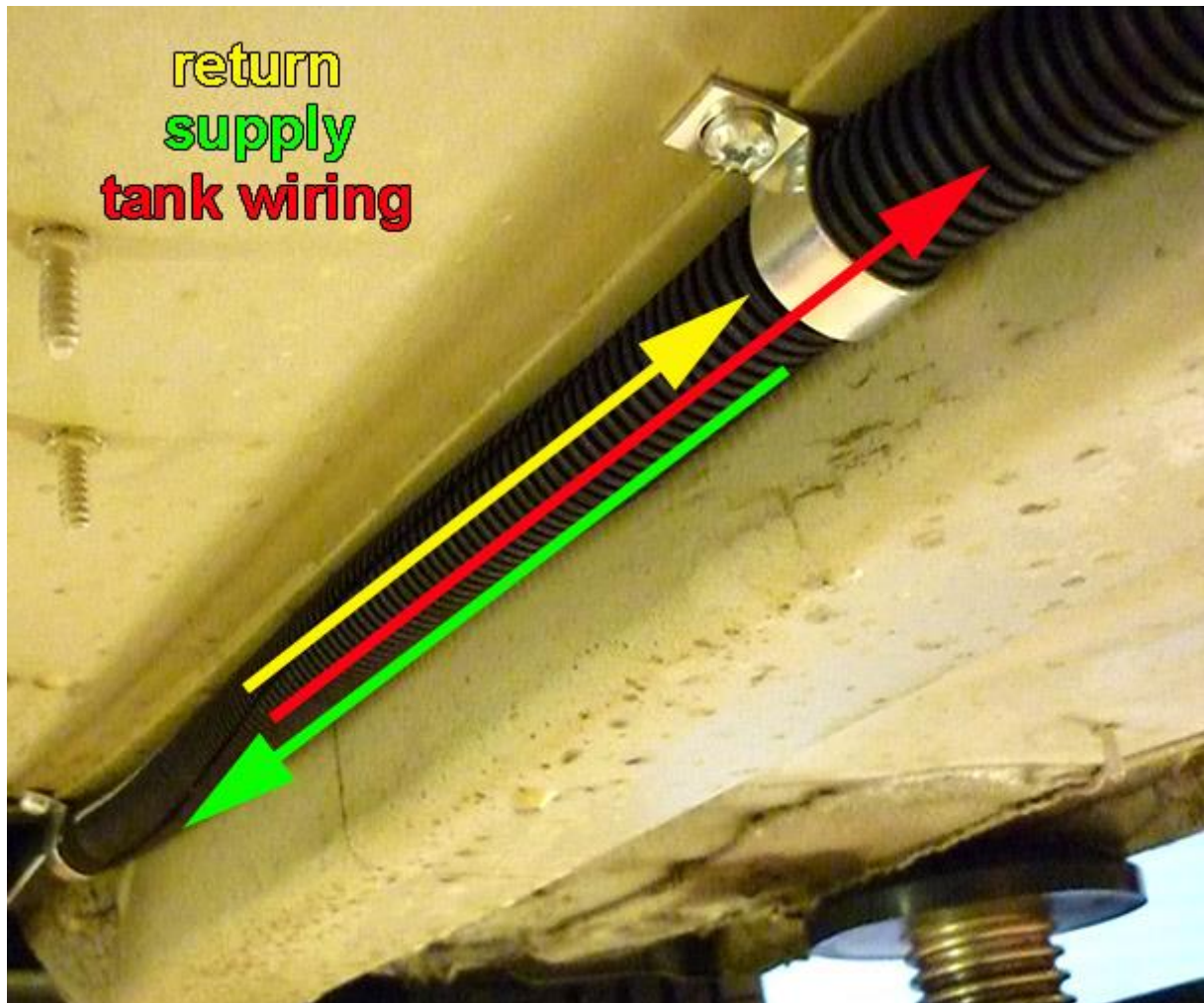
Mount hoses from high pressure pump to FSU & FRU.





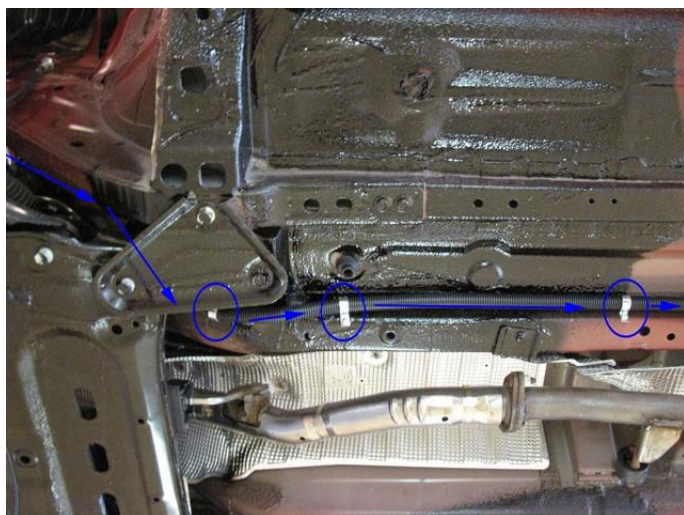
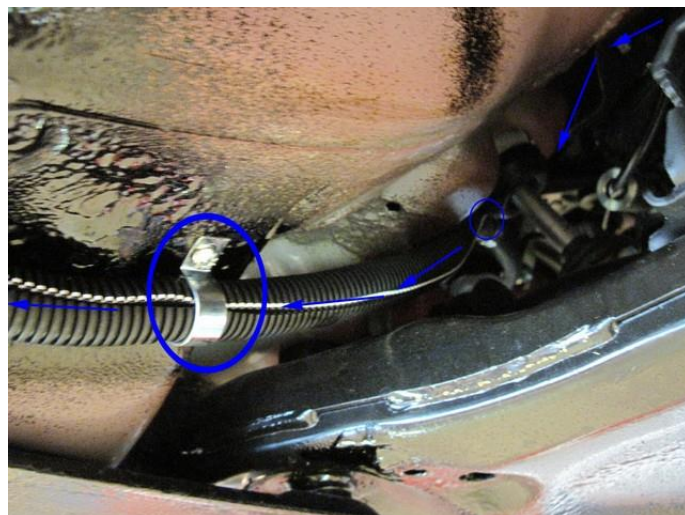
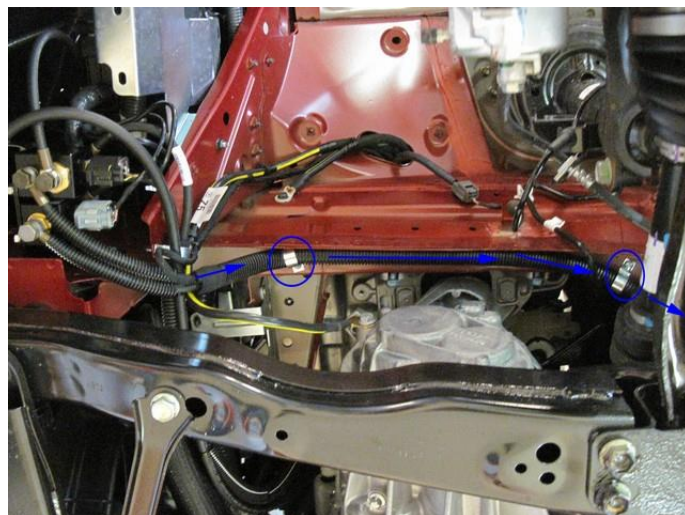
### Supply hose – Return hose – Tank wiring

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.



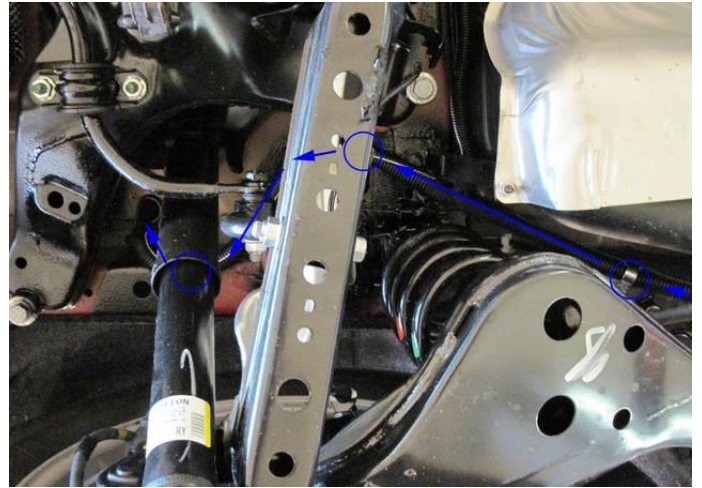


## Hose / wiring routing to tank 1





## Hose / wiring routing to tank 2



Loop the too long wiring underneath the vehicle to the fuel lines with protection.





## Mounting the AFC (bracket) / Mounting the fuse-relay box (bracket)

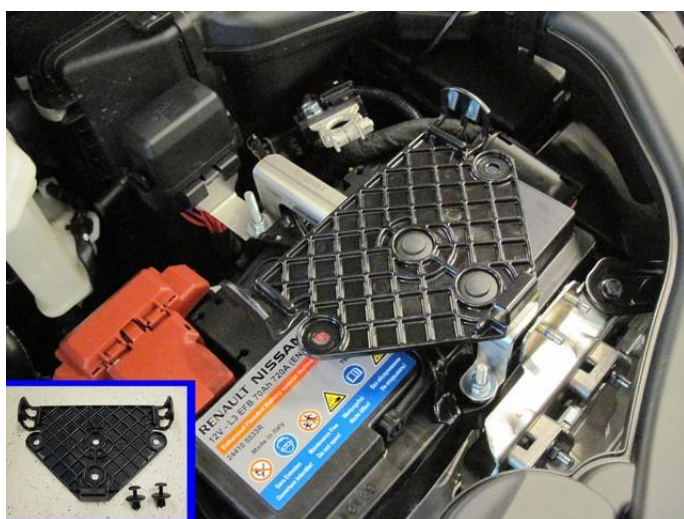
**Connect the wiring before mounting the AFC & fuse-relais box.**



Fuse-relay bracket. AFC bracket.



Mount the AFC & fuse-relay bracket to the original threaded rods from the battery clamp.



Mount the plastic AFC clip, AFC and fuse-relay box.

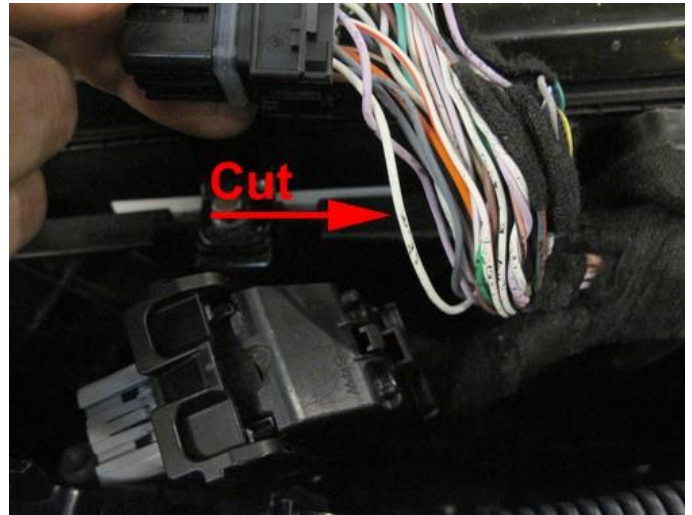
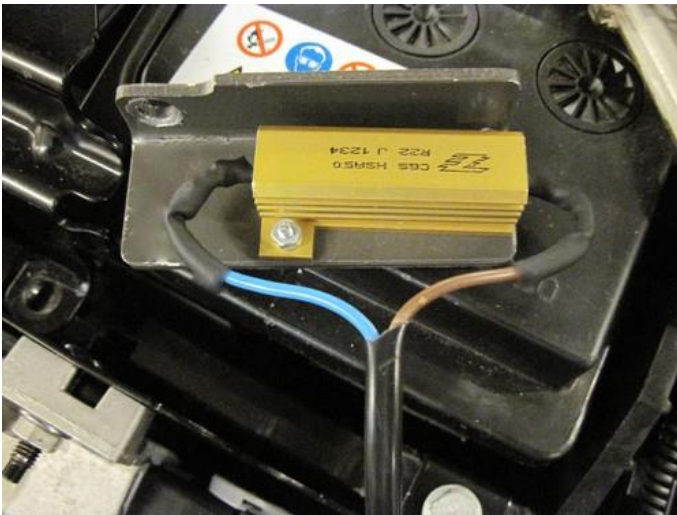




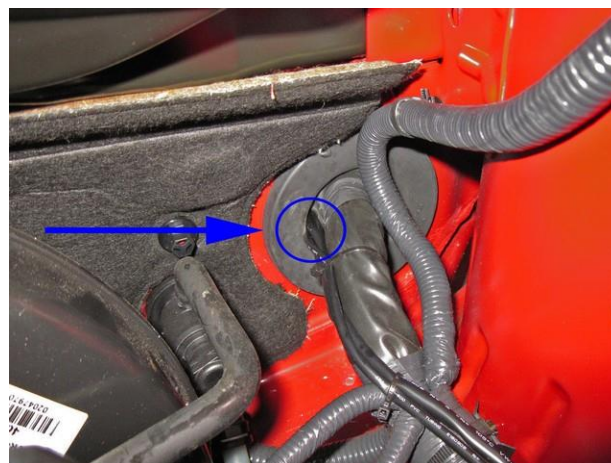
## Actuator resistor / Grommet / Wiring transit



Mount resistor on bracket. Mount bracket to front battery clamp mounting..



Connect wiring to resistor. Connect wiring to Petrol ECU (see electric connections!).



**Wiring to passenger room:**

Put wiring through grommet and use a silicone sealant around wiring for a waterproof transit.

Wiring to passenger room: **Switch / CAN / Wake-up.**





## Wiring routing / Wake-up / Can



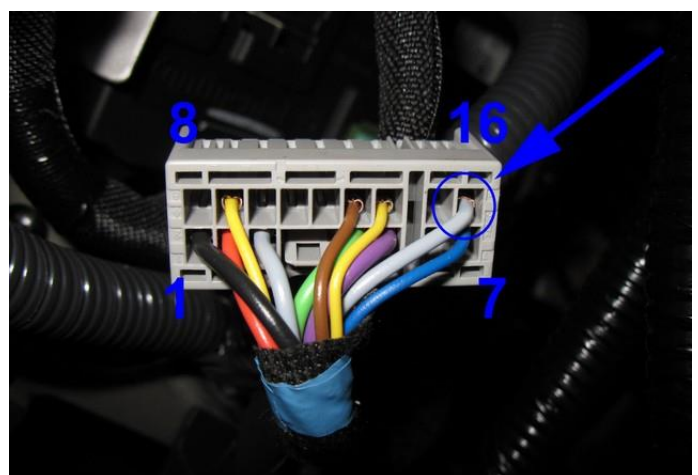
Wiring routing.



Overview inside.

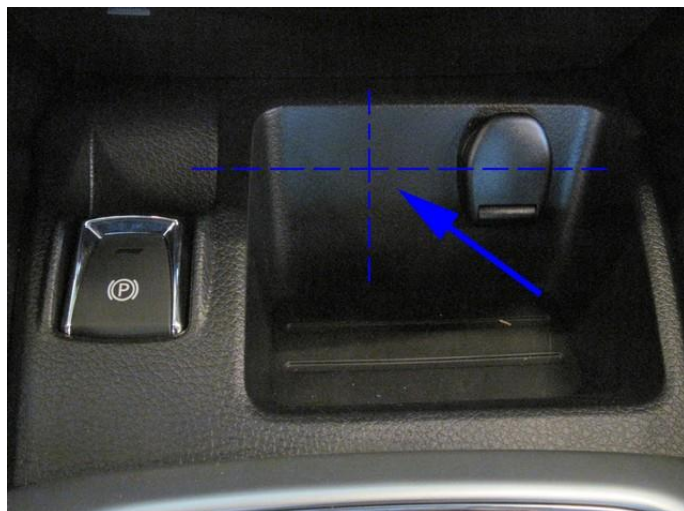


Loosen cover for easy access to the body control module for connecting the wake-up.

Wake up: Connector **BP GREY**, pos 16



## Switch



## Petrol ECU pinnings



*If you have to count from A to Q on the connectors, remember: there is no letter "i" on the connector.*

A1	B1	C1	D1	E1	F1	G1	H1	J1	K1	L1	M1	N1	O1	P1	Q1
			3AJP		3LP					3LO		3BY		3L	3CR
			X		X					X		X		X	X
A2	B2	C2	D2	E2	F2	G2	H2	J2	K2	L2	M2	N2	O2	P2	Q2
	3A7D	3LN								3AJR				3LC	3CU
		X								X				X	X
A3	B3	C3	D3	E3	F3	G3	H3	J3	K3	L3	M3	N3	O3	P3	Q3
			3BX	3CK		3CH				3EN	3CF	3CG	3CE	3LB	3CT
			X	X		X				X	X	X	X	X	X
A4	B4	C4	D4	E4	F4	G4	H4	J4	K4	L4	M4	N4	O4	P4	Q4
	3TA	3UCB						3A7B	3A7C					3LA	3CS
	X	X						X	X					X	X

Connector 1 (grey)

A1	B1	C1	D1	E1	F1	G1	H1	J1	K1	L1	M1	N1	O1	P1	Q1
	3S				3MD		3BG	3LX	3ALW	3ALV		3AN		3FB1	3FB2
	MG				X		X	X	X	X		X		X	X
A2	B2	C2	D2	E2	F2	G2	H2	J2	K2	L2	M2	N2	O2	P2	Q2
	3AA		3SV	3SX			3SY	3LJ	3MD	3BI		3BD	3BL	3SZ	
			X	X			X	X	X	X		X	X	X	X
A3	B3	C3	D3	E3	F3	G3	H3	J3	K3	L3	M3	N3	O3	P3	Q3
	3BG	3AC		3SW	3LY				3LZ				3ALG	3GF	3ZP
	X	X		X	X				X				X	X	X
A4	B4	C4	D4	E4	F4	G4	H4	J4	K4	L4	M4	N4	O4	P4	Q4
					3DL	3L	3MP		3LX	3AT	3BB	3VL	3K	3GG	3HI
					X	X	X		X	X	X	X	X	X	X

Connector 2 (black)

A	B	C	D	E	F	G	H	
			AP15		3WT	3FB	NH	1
			JA		X	X	NO	
3FX			3BG		3LU	3LR	3LS	2
X			X		X	X	X	
3SN		3PD	3BM		3LW	NH	3LT	3
X		X	X		X	NO	X	
3SM	HK	3BD		3A	3LV	NH	NH	4
X	X	X		X	X	NO	NO	

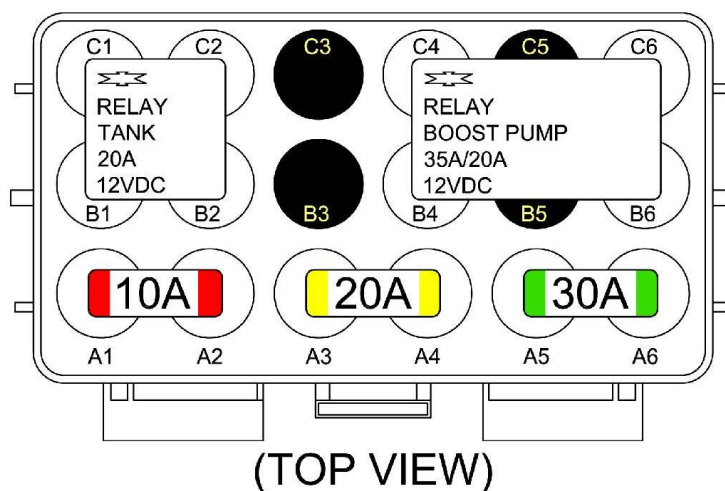
Connector 3 (black)



## 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	brown	Connect to the '-' of the battery ( -31 ) ; using ring terminals. Wire location : <b>ground on battery</b>
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 fuse in the holder before having completed the installation of the lpg system. Wire location : <b>+Batt on battery</b>





## Electrical connections

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

<b>Wire number / code</b>	<b>Wire colour</b>	
10 DAC 2	Green	insulate
17 AD 2	Blue-green	insulate
19 AD 4	Blue	insulate
20 AD 3	Blue-pink	insulate
21 AD 9	Blue-purple	insulate
22 LSS 1	Purple-white	insulate
23 LSS 2	Purple-green	insulate
42 Digital out pull up 2	Red-purple	insulate
56 DI 2	Yellow-green	insulate
58 +12V switched	Red-white	insulate
61 DI4	Yellow-blue	insulate
74 DAC 3	Green-pink	Insulate

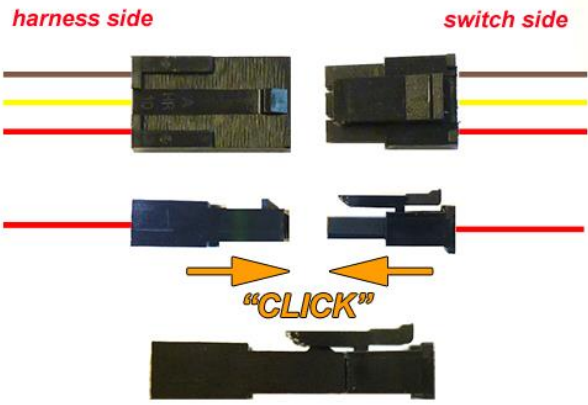
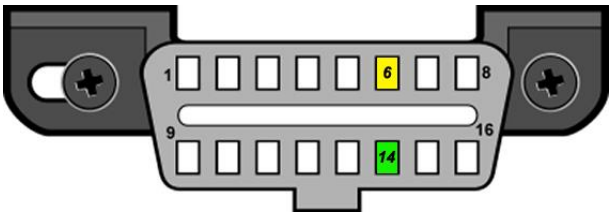
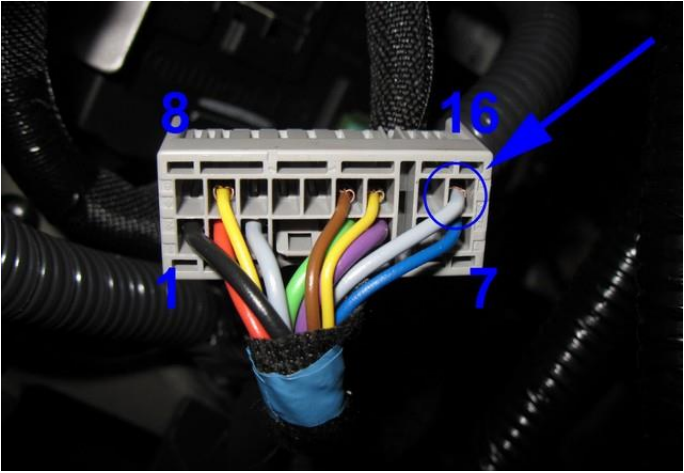




## Electrical connections

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

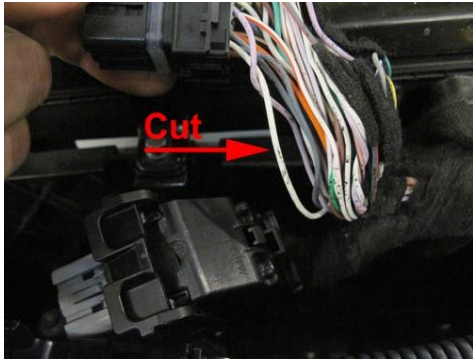
### Driver room

3-pole micro connector 66 Ground fuel switch 3 +12V fuel switch 49 LIN fuel switch	Brown-black Red-white Yellow	Connect the 3-pole connector to the Prins fuel selection switch.
<u>Inside!</u>		
51 CAN-High 70 CAN-Low	Yellow Green	EOBD connector pin 6 EOBD connector pin 14
<u>Inside!</u>		
40 <u>Inside!</u>	Grey-red	Wire colour : <b>Pink</b> or <b>Grey</b> Wire location : Body Control Module left side underneath dashboard, connector <b>BP Grey</b> , Pin <b>16</b> . 

## 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 petrol sensor signal interruption</i> Wire colour : <b>green</b> Wire location : <b>Connector 2 petrol ECU → H3</b>
36 AD 6	Blue-brown	Sensor side
25 DAC 1	Green-white	Petrol ecu side
63 Ground Shift	Blue-orange	<i>High pressure petrol sensor ground</i> Wire colour : <b>brown</b> Wire location : <b>Connector 2 petrol ECU → H2</b>
60 DI3	Yellow-pink	<i>High pressure petrol sensor 5Volt supply</i> Wire colour : <b>tan</b> Wire location : <b>Connector 2 petrol ECU → D1</b>
15 T-ect	Grey	<i>For measuring the engine coolant temperature.</i> Wire colour : <b>brown</b> Wire location : <b>Connector 2 petrol ECU → L3</b>
8 RPM engine speed	Purple-white	<i>For measuring the engine speed signal.</i> Wire colour : <b>blue</b> Wire location : <b>Connector 1 petrol ECU → K3</b>
18 AD 1	Blue-white	<i>For measuring the inlet manifold pressure from the MAP sensor</i> Wire colour : <b>white</b> Wire location : <b>Connector 1 petrol ECU → B2</b>
7 +12V IGNITION	Grey - white	<i>Make a connection to +ignition / contact+ (+15).</i> <b>Do not place the fuses</b> in the holder before having completed the installation of the lpg system. Wire colour : <b>grey</b> Wire location : <b>Connector 3 petrol ECU → D1</b>

2-core wire from actuator resistor  <b>See page 21</b>		<p>Wire colour : <b>White</b> Wire location : <b>Connector 2 petrol ECU →</b> interrupt wire <b>Q4</b> and connect the 2 resistor wires. Both ways possible.</p> 
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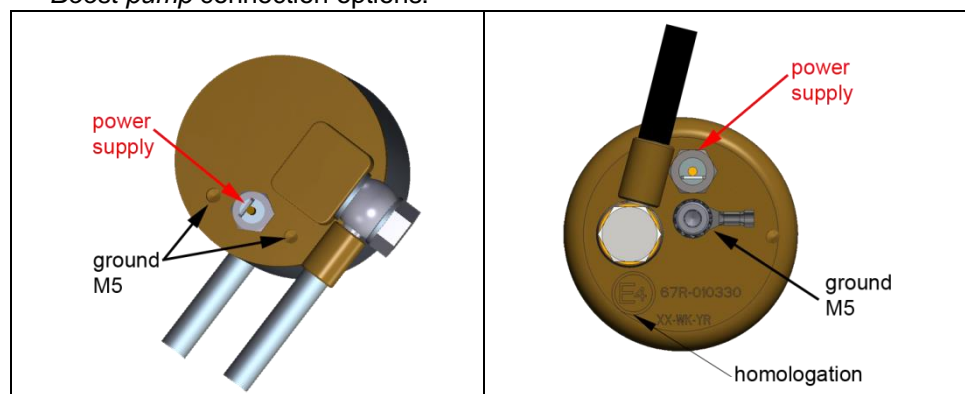
## Electrical connections

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>		
35 C Ground pin A	Brown	Connect the 3-pole connector to the Psys sensor positioned into the Fuel Return Unit.
9 +5V sensor pin B	Red	Sensor wire pin A
16 Psys pin C	Green	Sensor wire pin B
		Sensor wire pin C
14 T-LPG	Grey	Not used, insulate.
<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>		
46 Service TxD	Grey	Diagnose connector for service / diagnosis
65 Service RxD	Grey	Connector pin 1
68 C ground	Brown	Connector pin 2
		Connector pin 4
<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

### Boost pump connection options:

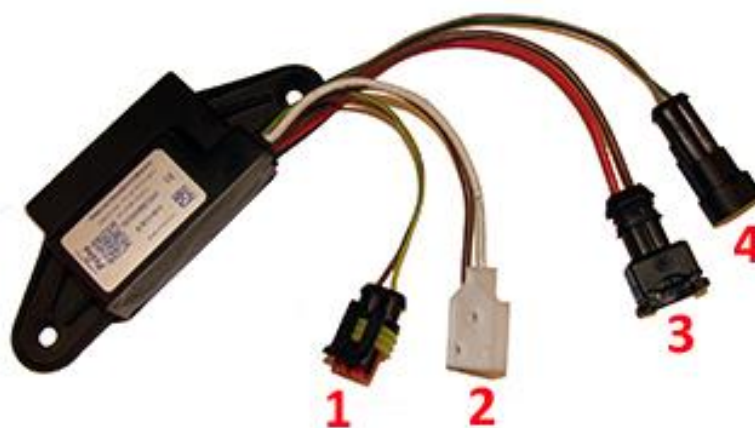


## Electrical connections

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
<b>3-pole tank level connector</b> 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.
<b>2-pole driver connector</b> 71 LSS 3 PWM driver 64 AD 5 driver diagnose	Purple-pink Blue-grey	Connect the 2-pole connector to the pump driver (4).
<b>1. 2-pole connector tank lock-off</b>	Green-yellow Brown	From tank pump driver From tank pump driver
<b>2. 3-pole connector tank pump</b>	Red 2.5mm <sup>2</sup> Brown 2.5mm <sup>2</sup>	From tank pump driver From tank pump driver
<b>3. 2-pole connector power driver</b>	Red 2.5mm <sup>2</sup> Brown 2.5mm <sup>2</sup>	From tank pump relay 87 From main ground
<b>4. 2-pole connector driver</b>	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.

