ALTERNATIVE FUEL SYSTEMS

Prins

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

Installation manual
Dedicated
PART 2/2

MANUFACTURER	Renault
TYPE	Megane Estate
ENGINE DISPLACEMENT	1200cc
NUMBER OF VALVES	16v
ENGINE CODE / NUMBER	H5F (TCe115)
VEHICLE CATEGORIES	M
TRANSMISSION	MT(6)
VERSION	Direct LiquiMax-2.0
PETROL ECU MANUFACTURER / CODE	Continental EMS3150
HIGH PRESSURE PETROL POMP	Denso 166304016R
HIGH PRESSURE PETROL INJECTOR	x
MODEL YEAR:	2012
SYSTEM APPROVAL NUMBER (R115)	E4-115R-000012 / DLM-LPG 06
LOCATION SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	359/070001/A
MANUAL NUMBER	076/1906500
DATE	2014-08-05

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
- 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

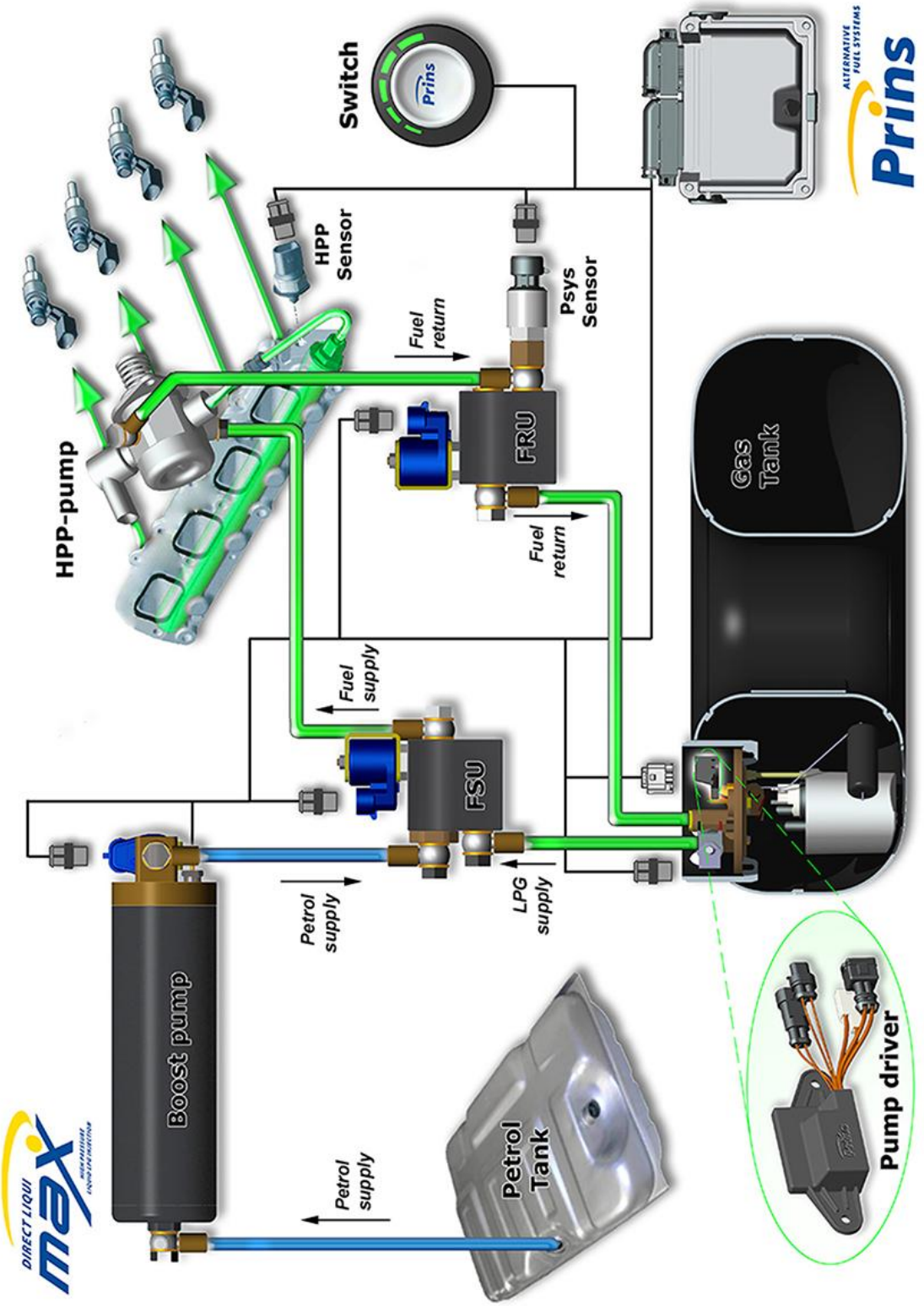
		Nm	SW
M 4 x 0,7		3.3	7
M 5 x 0,8		6.5	8
M 6 x 1,0		11.3	10
M 7 x 1,0		14.5	11
M 8 x 1		24.5	13
M 8 x 1,25		27.3	13
M 10 x 1		52	15-16-17
M 10 x 1,5		54	15-16-17
(filtered)Banjo bolt		10	14
Supply line connection		15	13
Fuel module Allen bolts		20	7
Filler hose connection		50	22
HPP cover Hitachi		220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

EXPLANATION OF SYMBOLS :

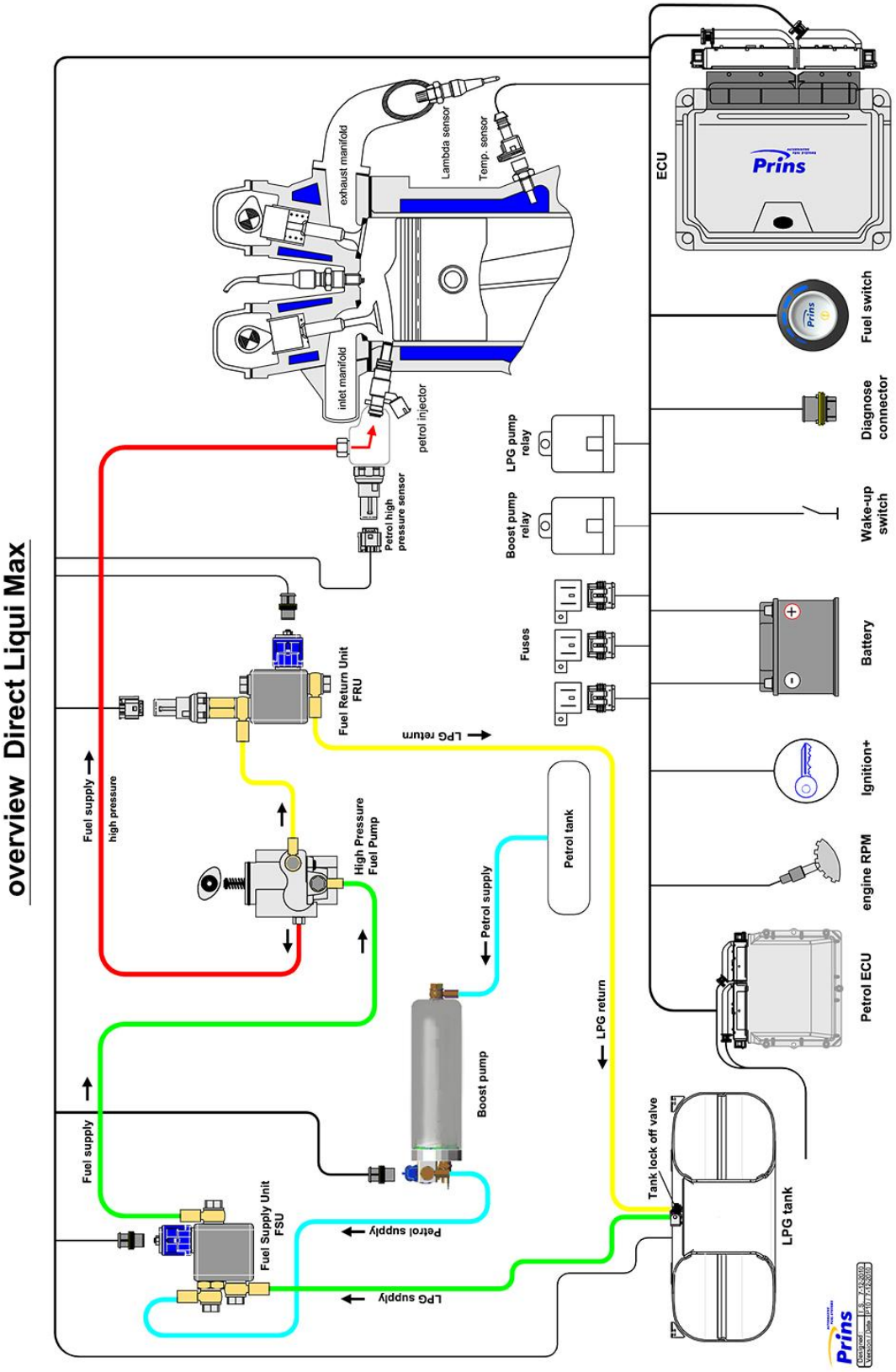
= IMPORTANT, CAUTION

= WEAR SAFETY GOGGLES

Direct LiquiMax



Overview Direct LiquiMax



Direct LiquiMax parts / approval numbers

<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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<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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<tr>
<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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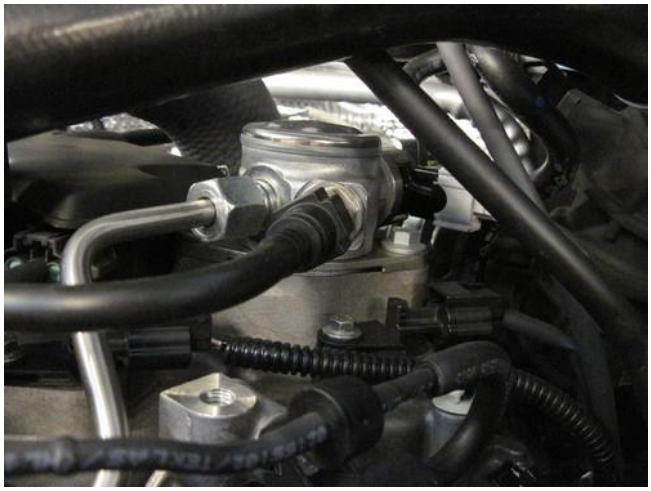
Mounting and connection points

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 2
G : Tank relay	S : Analog 3
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

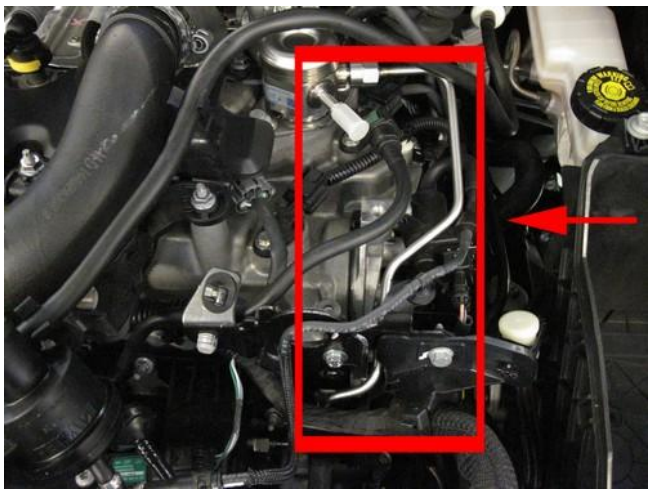
L:
R115 approval sticker :
Right side centre door post

High pressure pump installation 1

Replace the high pressure pump for the new high pressure pump.
(Follow the workshop manual of the car)

Remove the original High Pressure Pump and Fuel Line between HP pump and petrol injector rail.

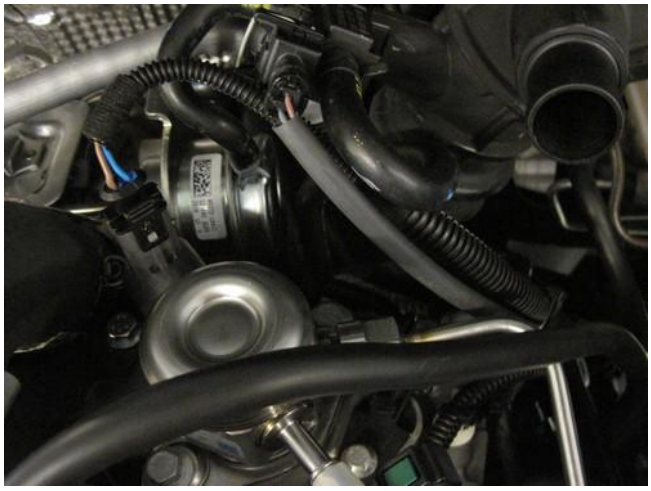
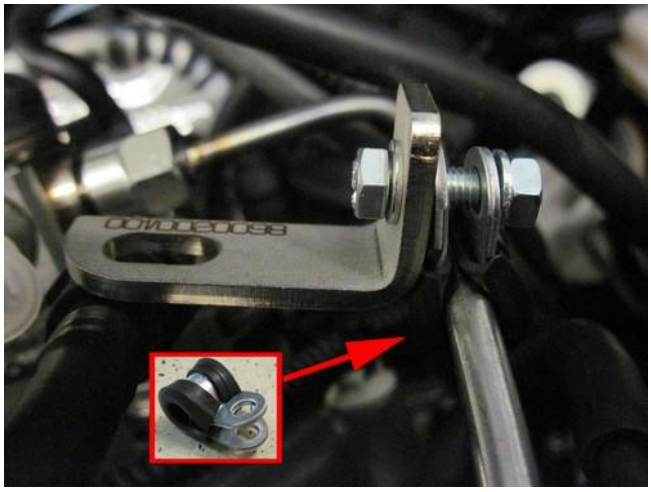



Mount the new HP pump and the new fuel line between HP pump and petrol injector rail.

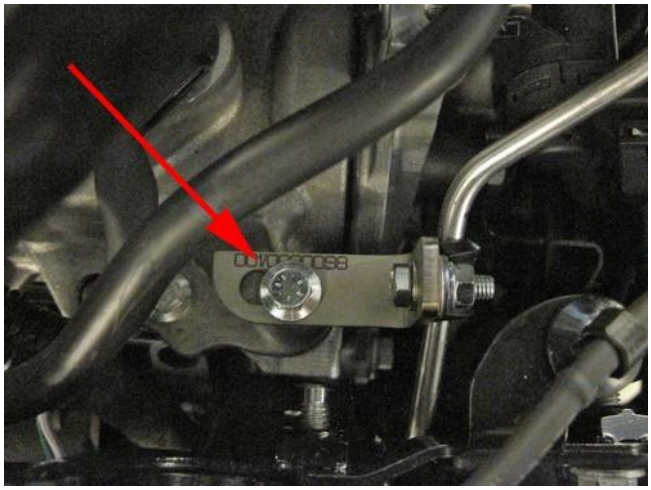
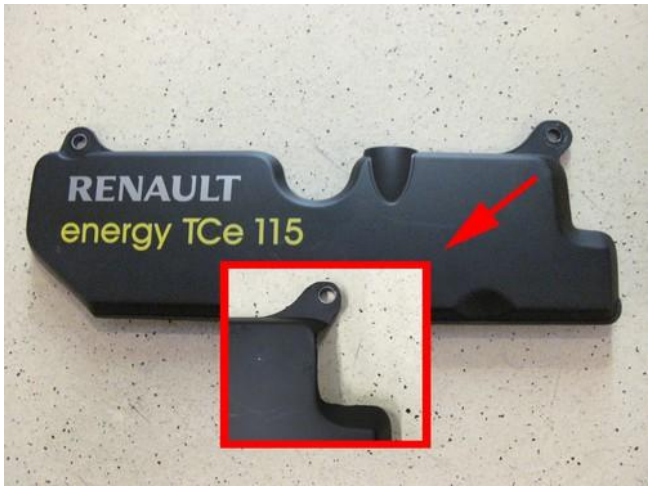
For easier mounting of the new fuel line, remove the throttle body.

High pressure pump installation 2


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.

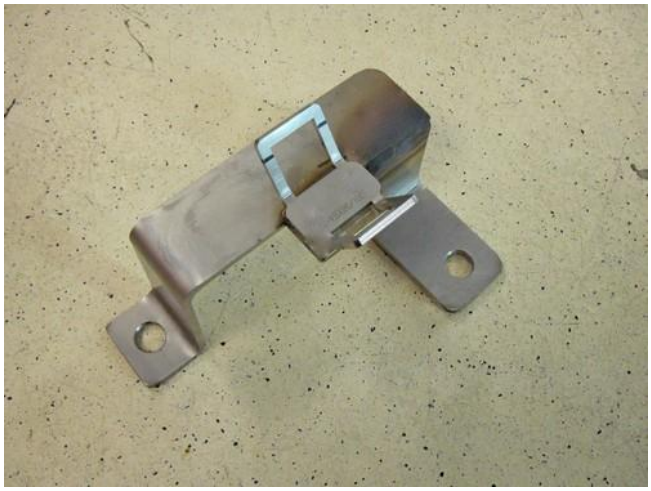



Mount connector to new HP pump. Mount the fuel line support bracket with clamp to the fuel line.

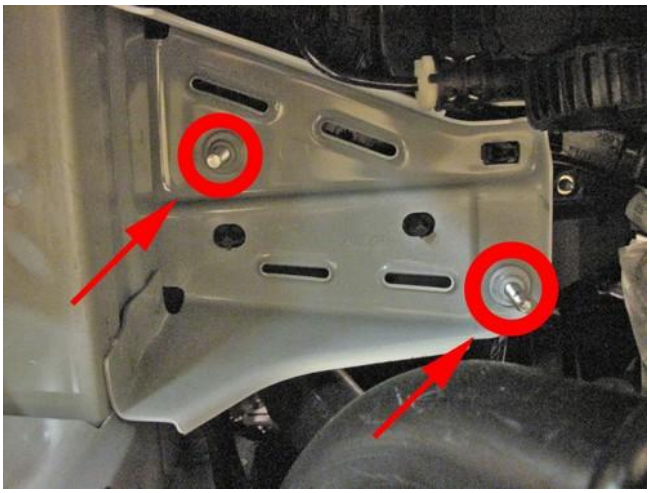



Mount bracket onto engine with original bolt. Adapt cover for mounting DLM fuel lines.

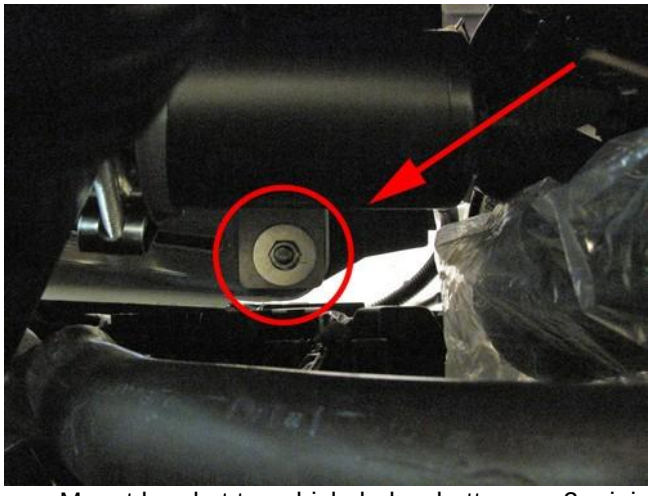
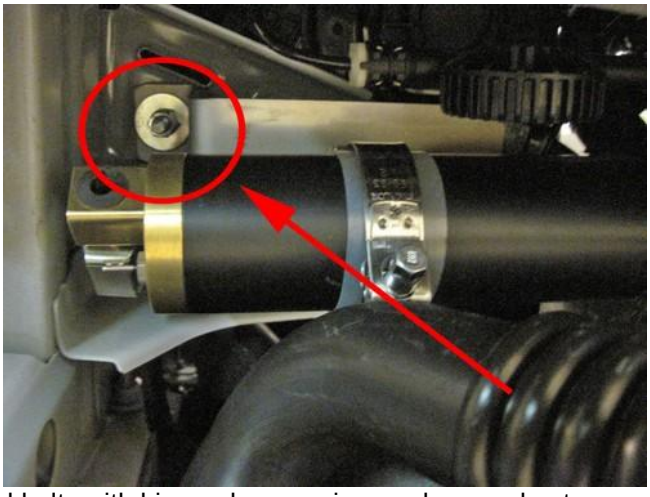
Boost pump




Mount boost pump clamp on bracket.

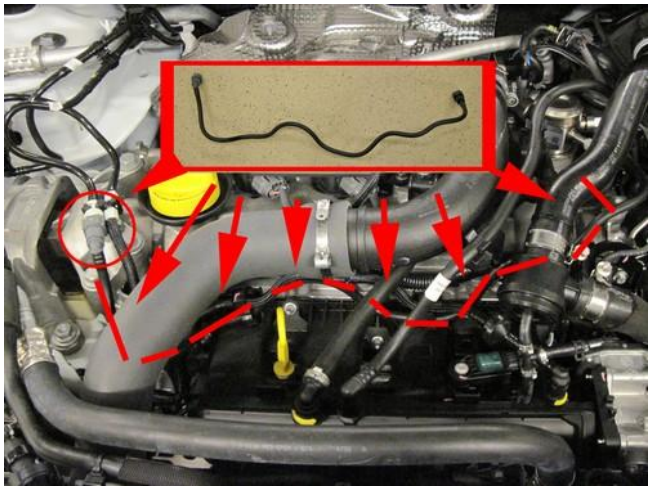
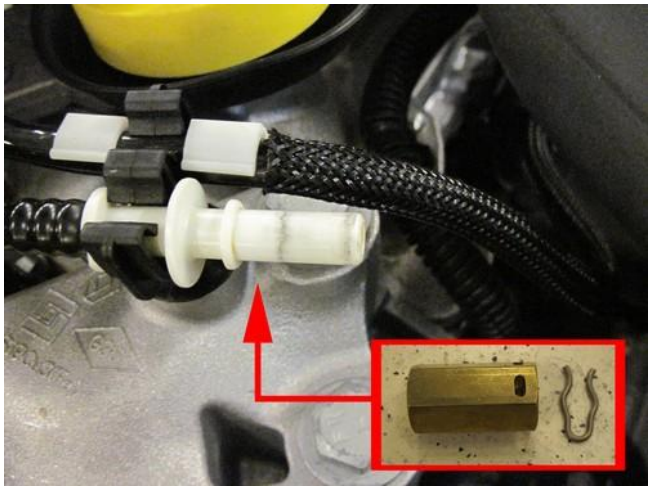



Mount boost pump in clamp with rubber ring in between. Mount bracket to vehicle below battery on 2 original bolts.

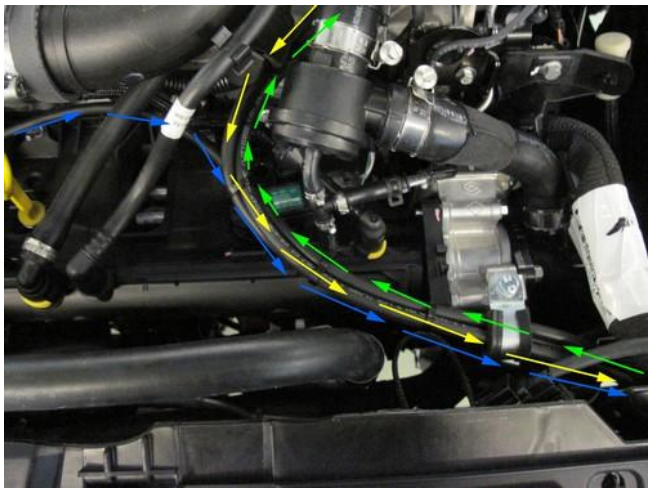



Mount bracket to vehicle below battery on 2 original bolts with big washers, spring washers and nuts.

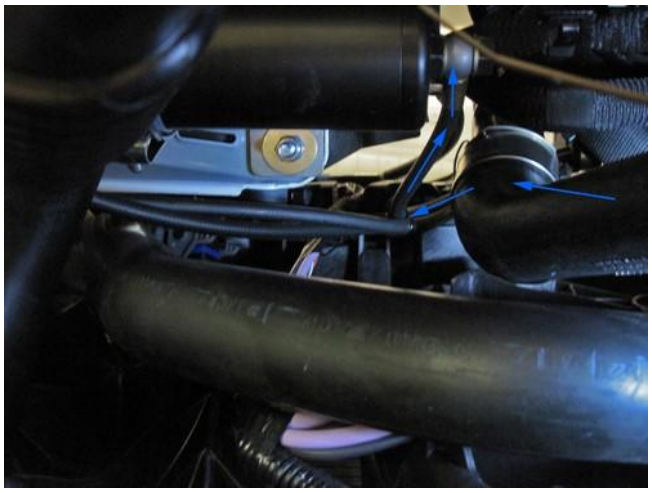
Connection of the fuel hose to the boost pump.

Remove original fuel line to HP pump. Mount adapter to original connection.

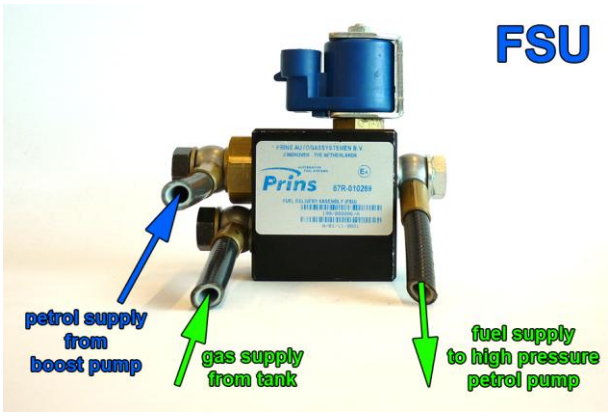



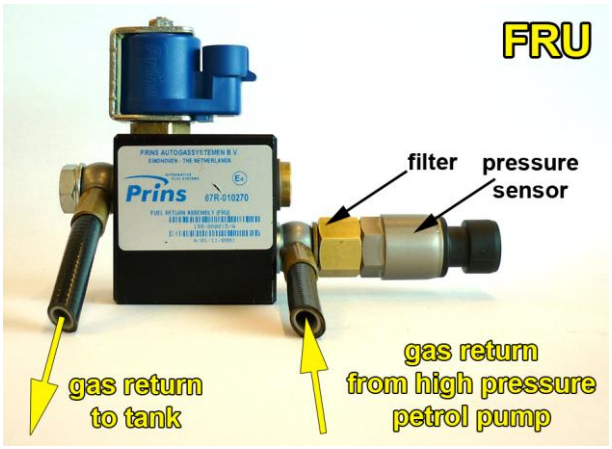
Mount fuel line (blue arrows) from adapter to the boost pump.

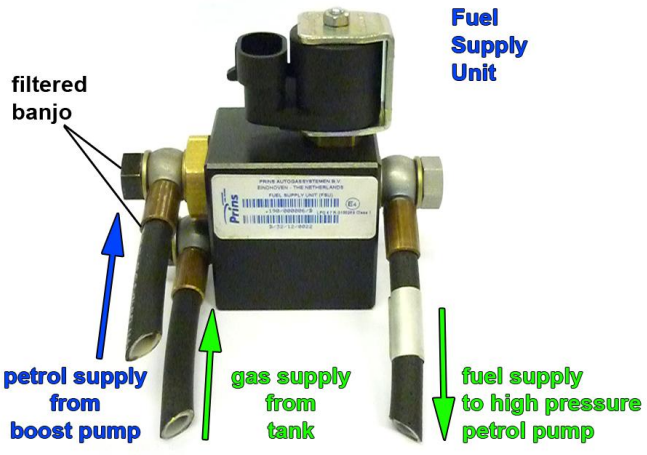


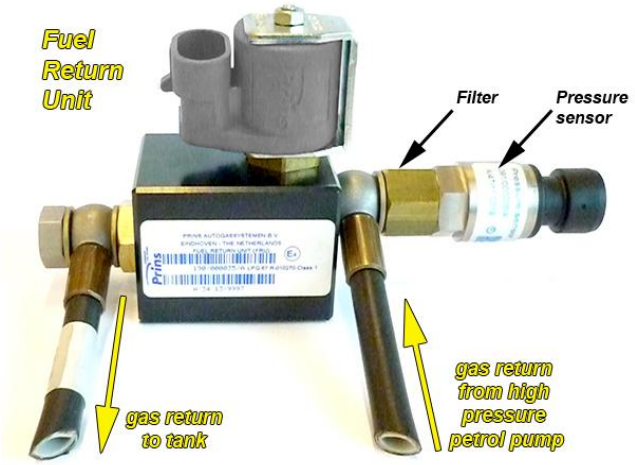
Mount the fuel line (blue arrows) from the adapter to the boost pump. Use a banjo with filter to connect the fuel line to the boost pump.

Fuel Supply Unit / Fuel Return Unit





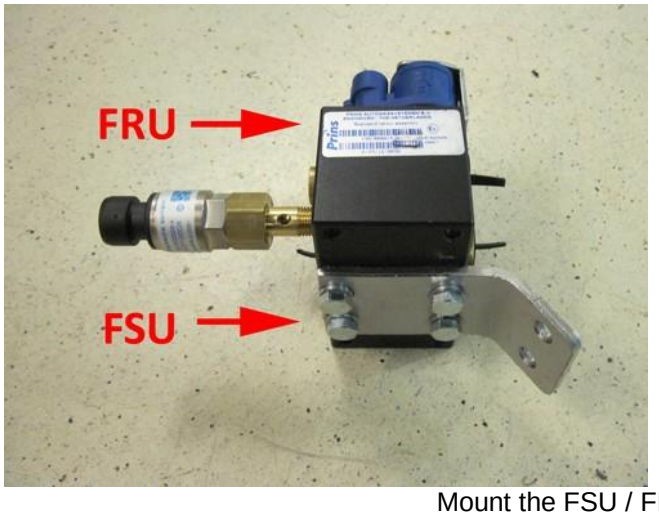


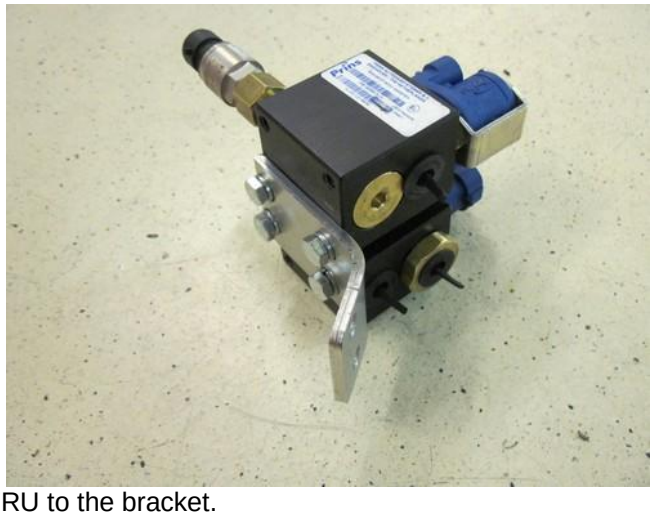


Black filtered banjo will only be used on inlet connections !

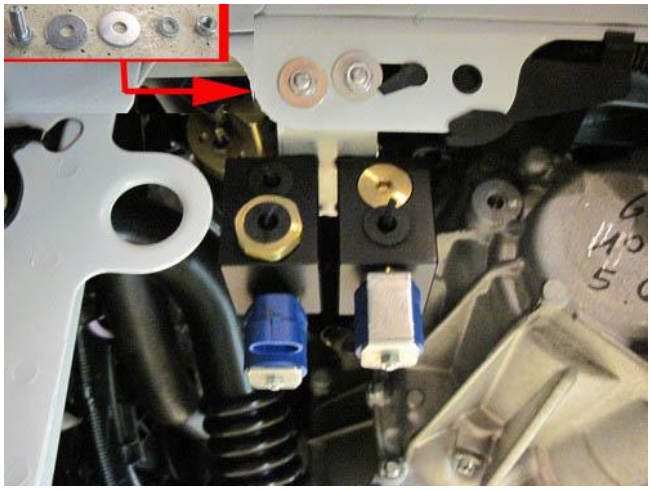
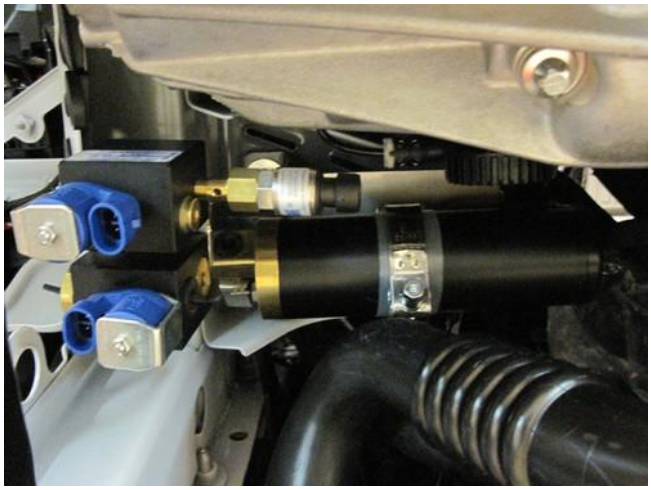
Filter inside sensor banjo

Mounting the FSU / FRU





Mount the FSU / FRU to the bracket.

Mount the bracket with FSU / FRU to vehicle with M6 bolts, (spring)washers, and nuts.

Lpg / petrol fuel lines

Hose	from	to	Length (cm)
XD-3	Adapter original petrol hose	Petrol boost pump	100
XD-3	Fuel supply unit	High pressure petrol pump	100
XD-3	Petrol boost pump	Fuel supply unit	30
XD-3	Fuel return unit	High pressure petrol pump	110
n.a.	Fuel return unit	High pressure petrol rail	n.a.

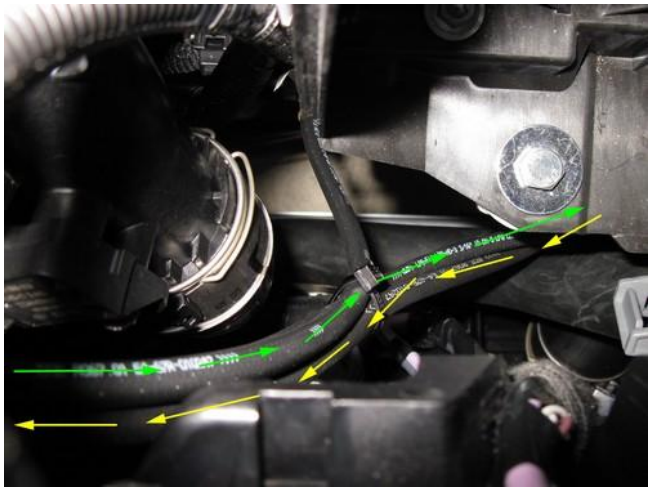
Install the fuel line using two bonded seal washers and banjo bolt :

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

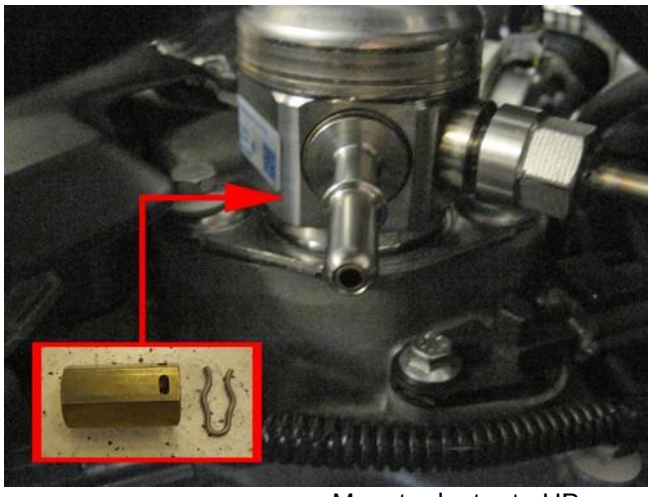
181/300009/A

Hose routing Boost pump / FSU / FRU - 1


Mount hose from boost pump to FSU. Mount hoses from FSU / FRU to HP pump.



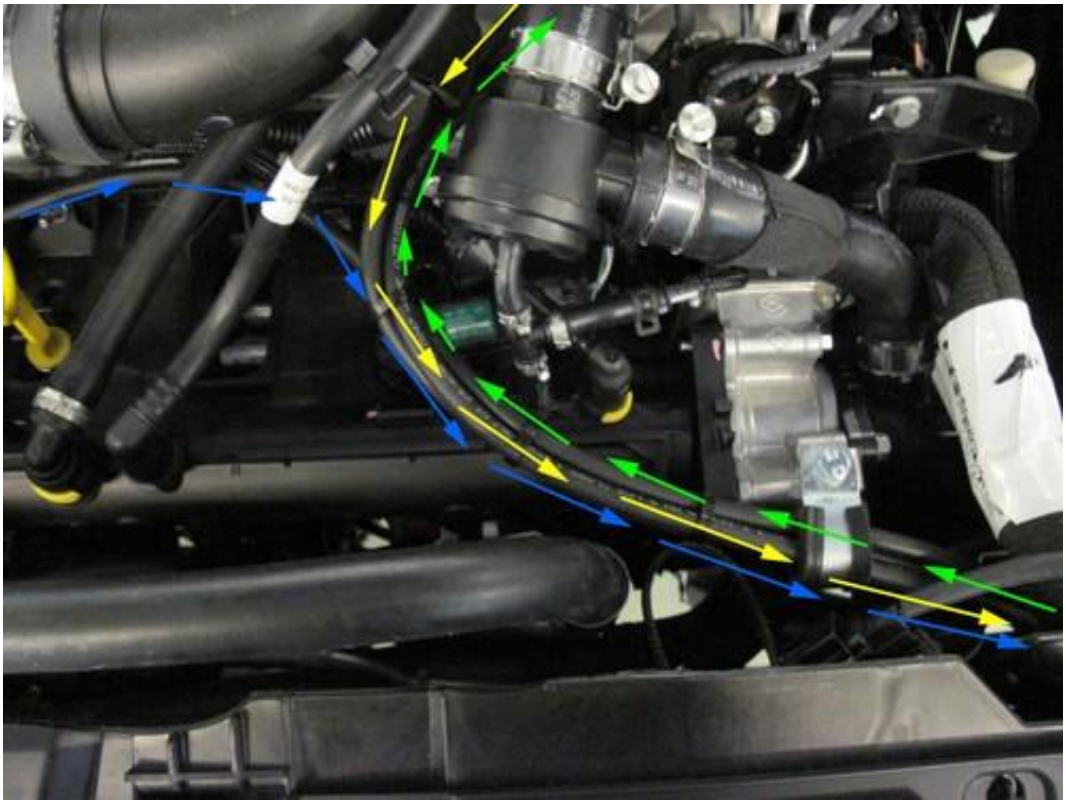

Mount hoses from FSU / FRU to HP pump.




Mount adapter to HP pump. Mount hoses to HP pump.

Hose routing Boost pump / FSU / FRU - 2

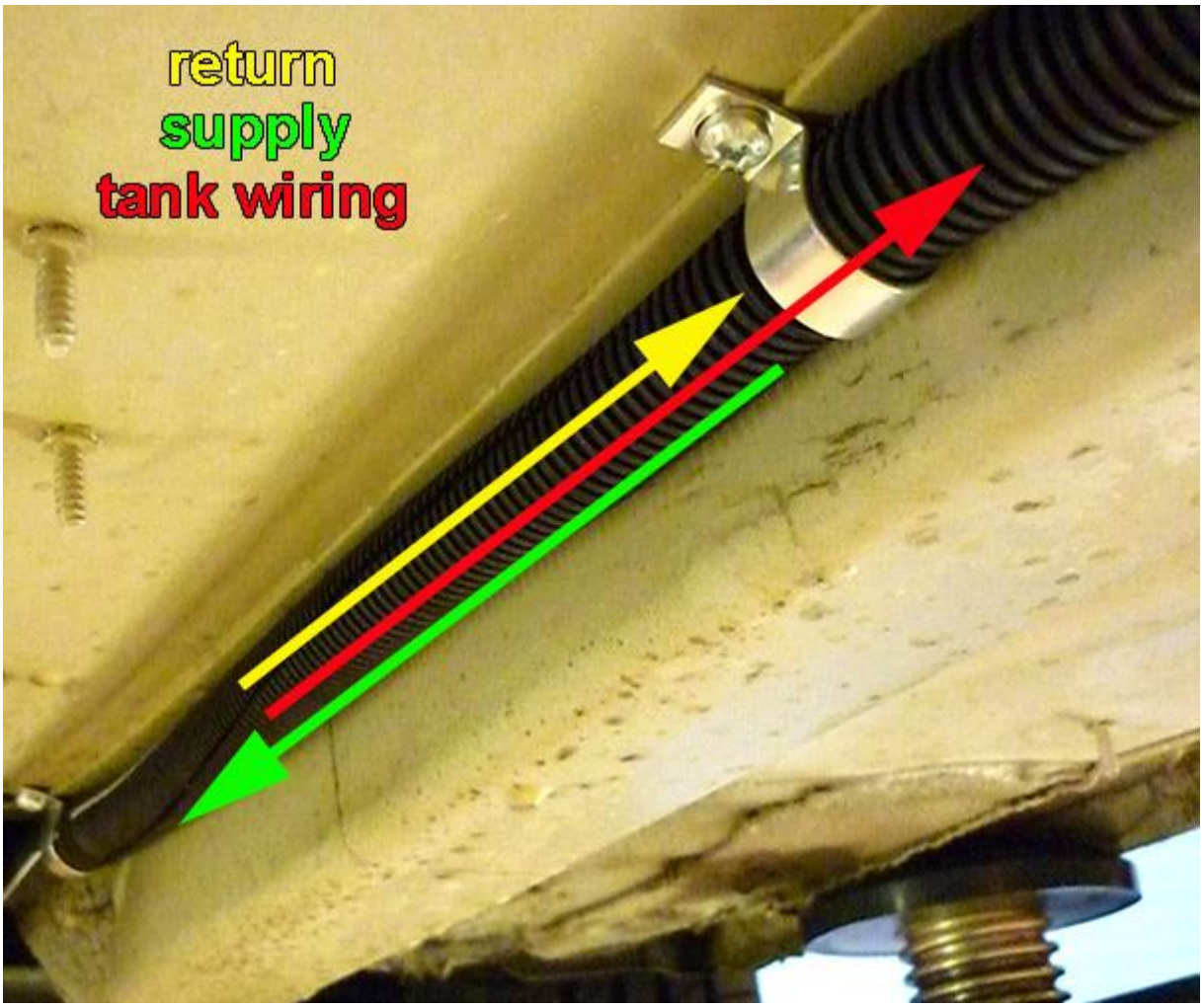
Mount fuel line support bracket to throttle body with original bots. Use clamp to fixate fuel lines (all three lines).



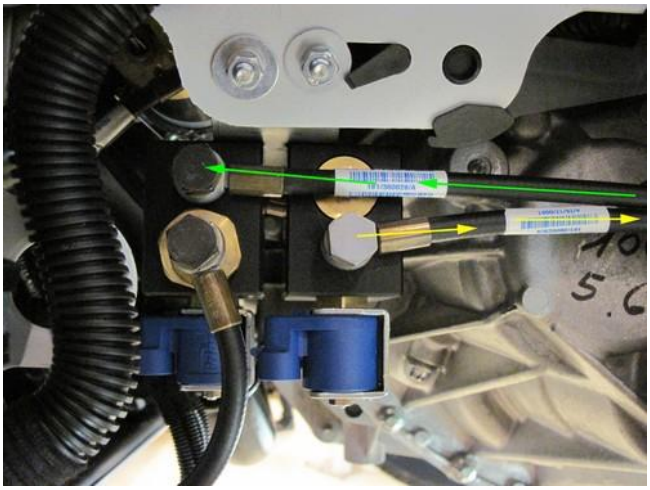
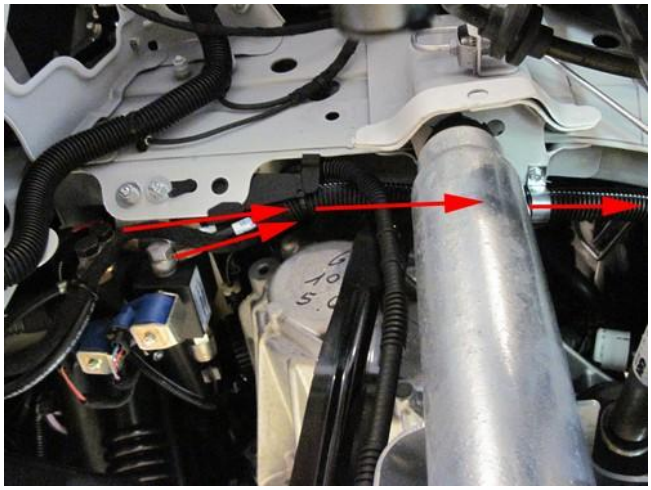
Overview fuel lines.

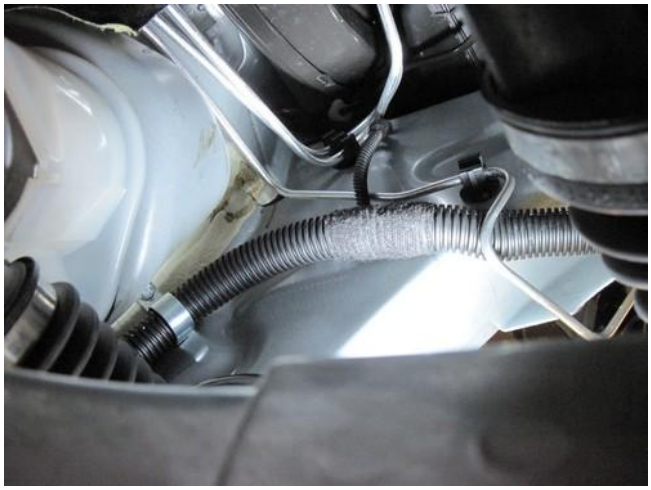
Supply hose – Return hose – Tank wiring

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.

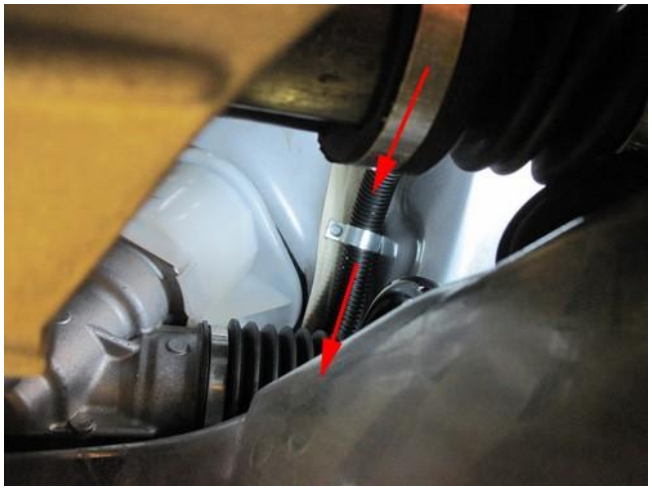


Hose / wiring routing to tank - 1

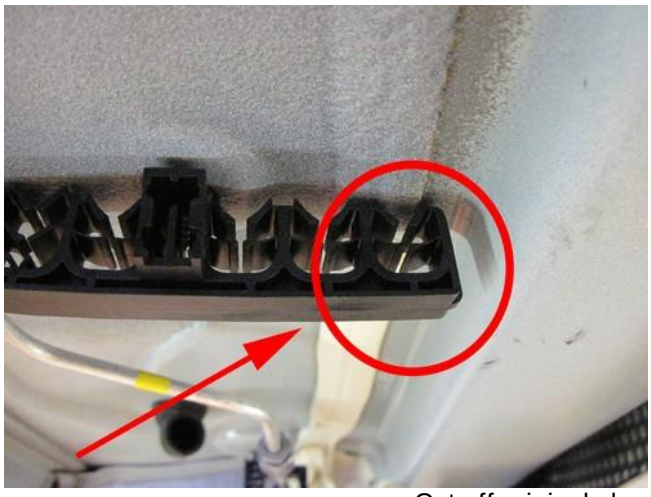





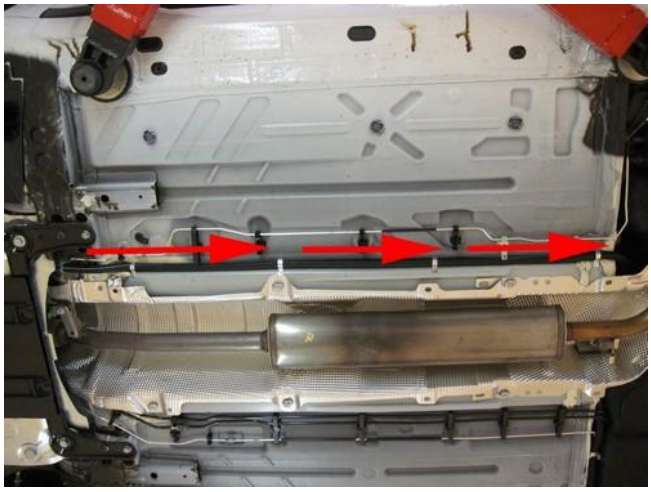
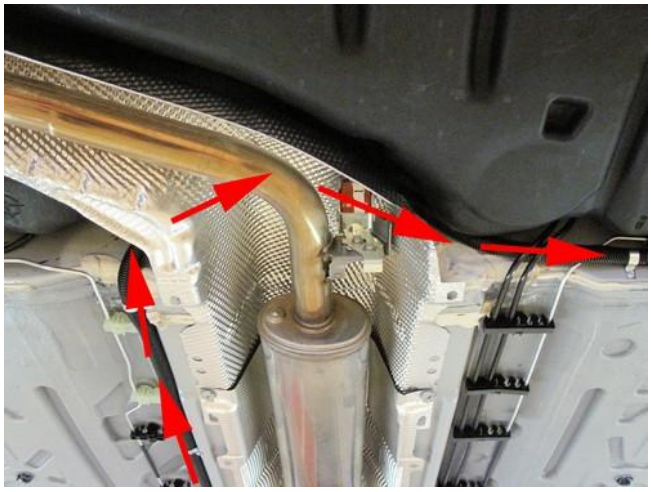
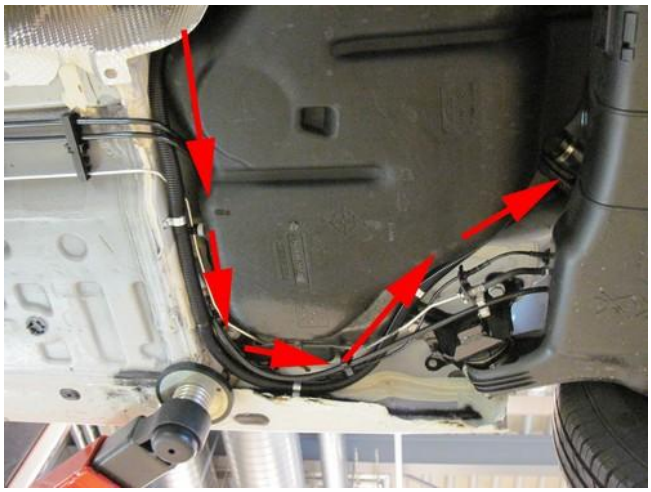
Pull out wiring for wake-up, switch, CAN & fused +Battery.



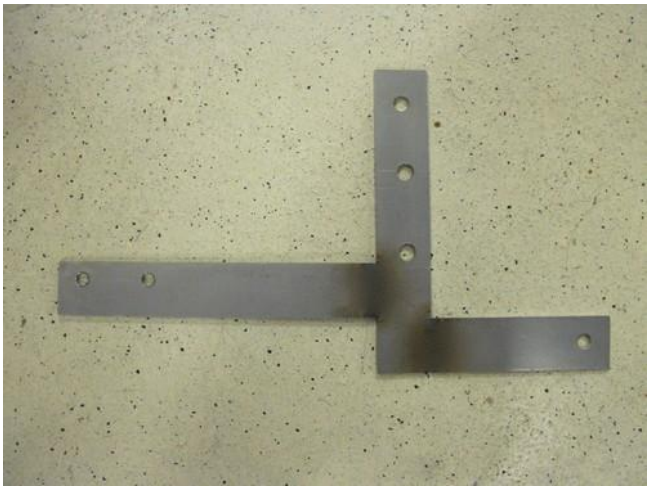
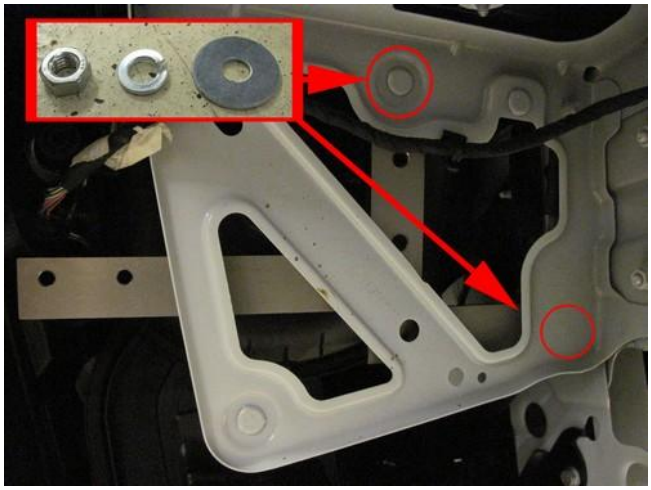
Hose / wiring routing to tank - 2



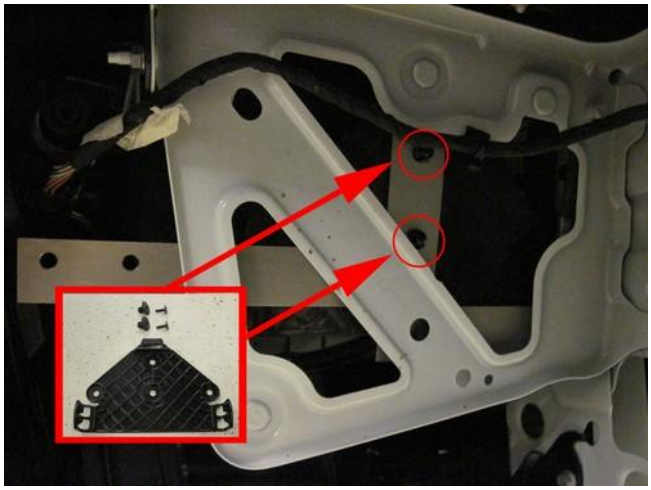
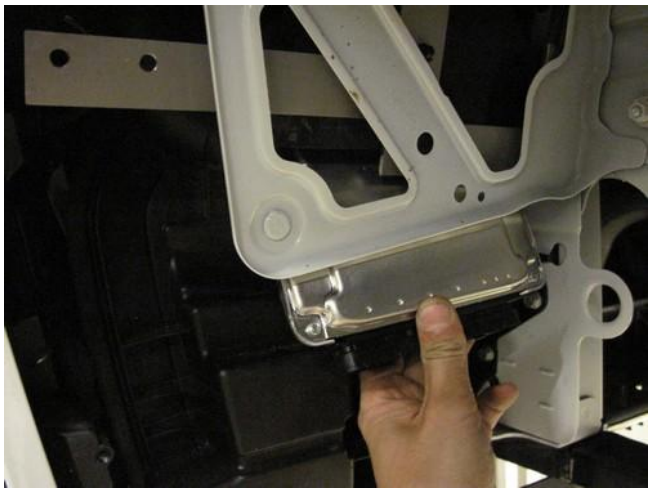

Cut off original clamps where necessary.


Mounting the AFC

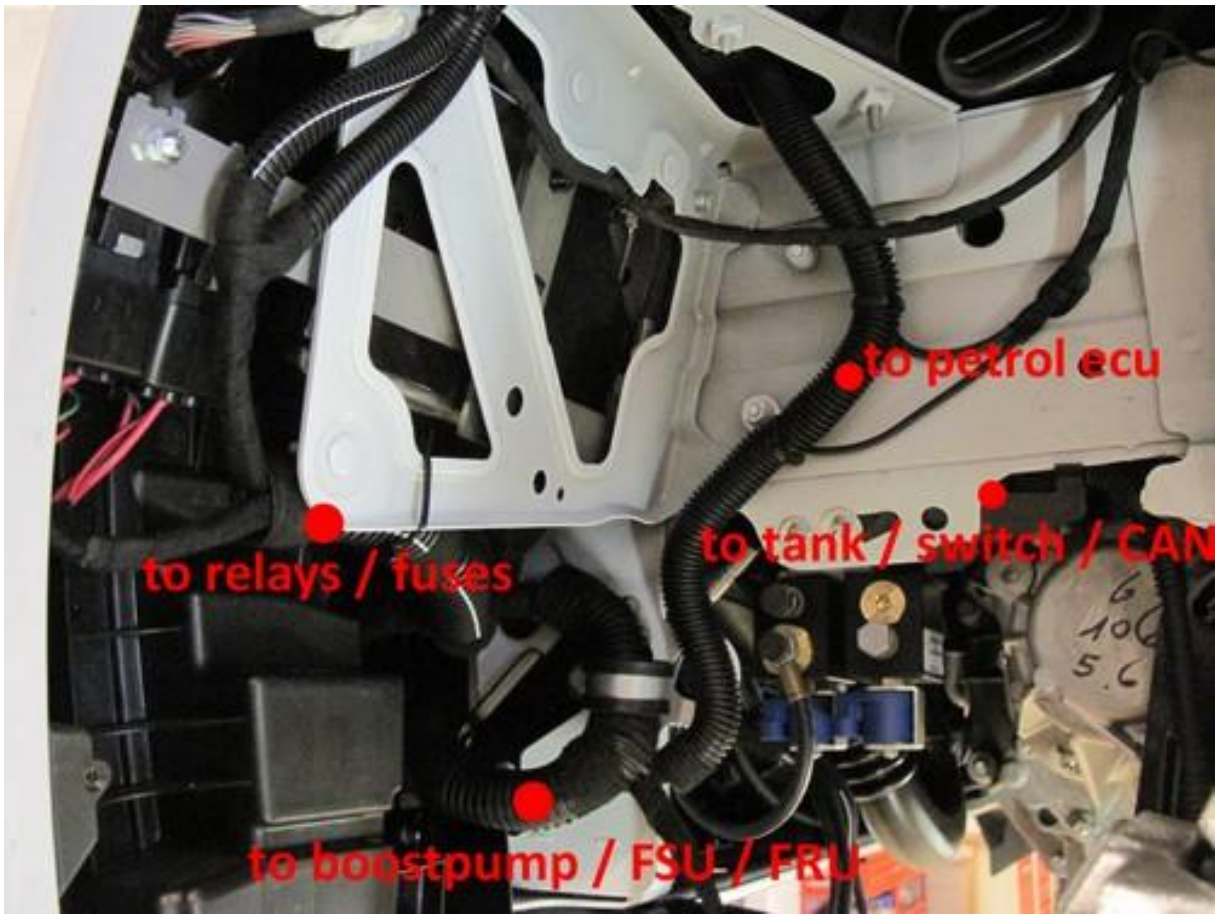



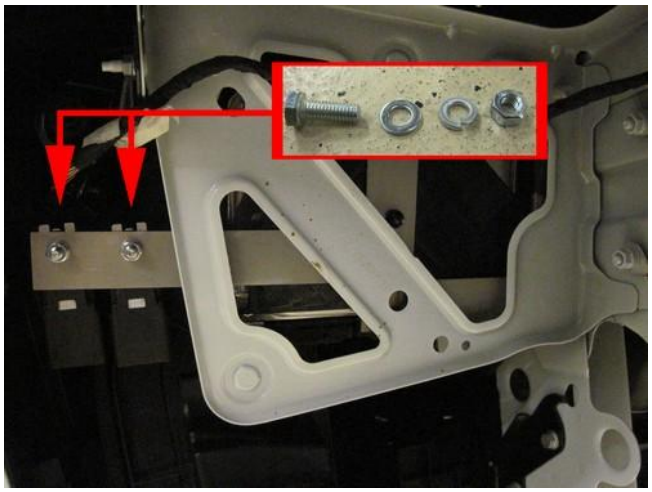
Mount bracket to original threaded ends with washers and nuts.

Mount AFC clip to bracket with quick lockings. Mount AFC to AFC clip.

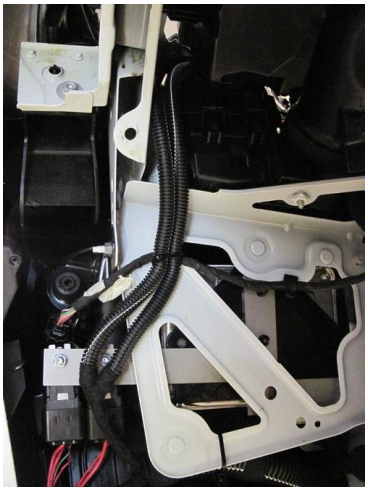
Wiring routing AFC / relay location



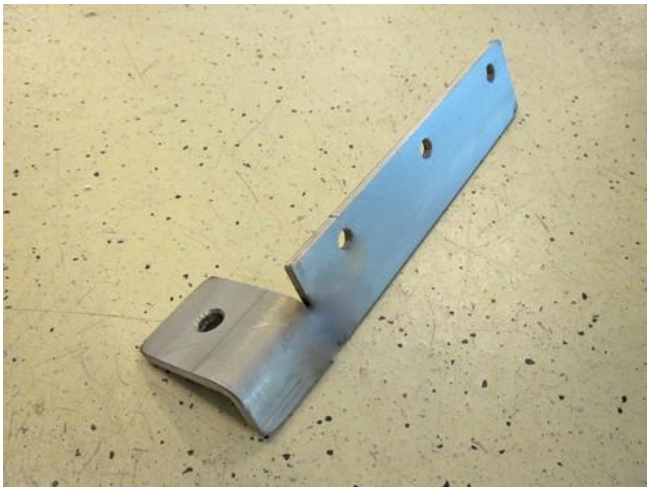


Mount relays to AFC bracket with M6 bolt, (spring)washers & nuts.

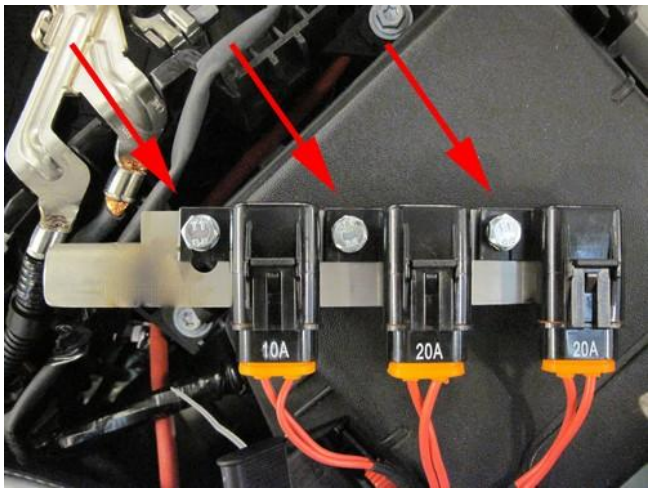
Fuses / diagnostic connector

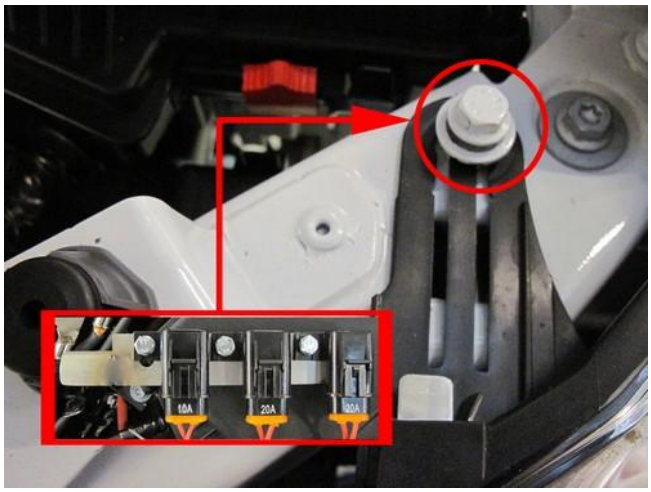


Wiring routing fuses / diagnostic connector.

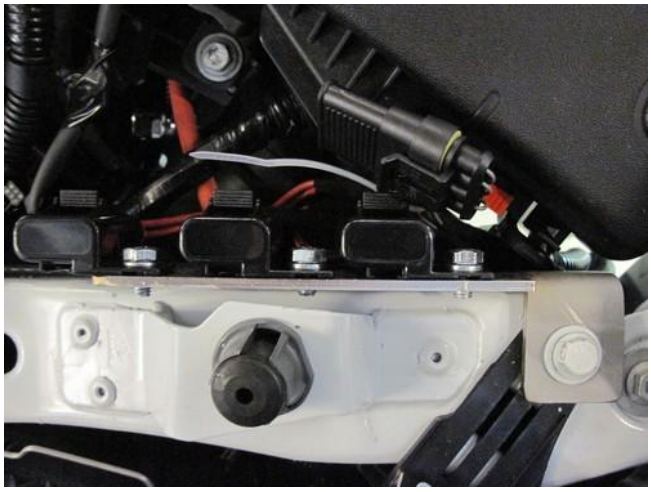


Bracket for fuses.

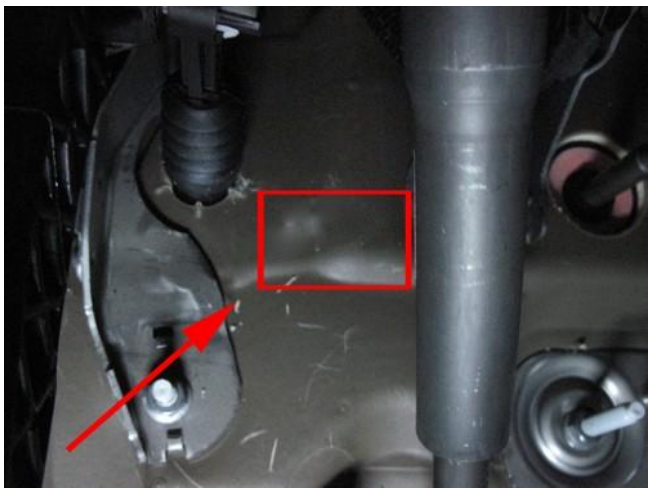
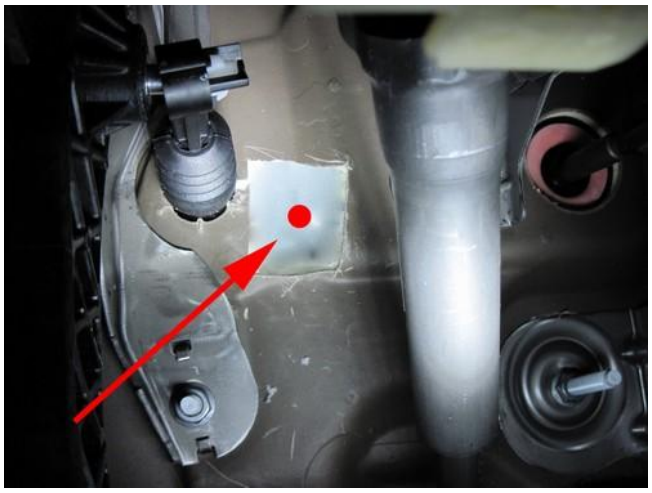




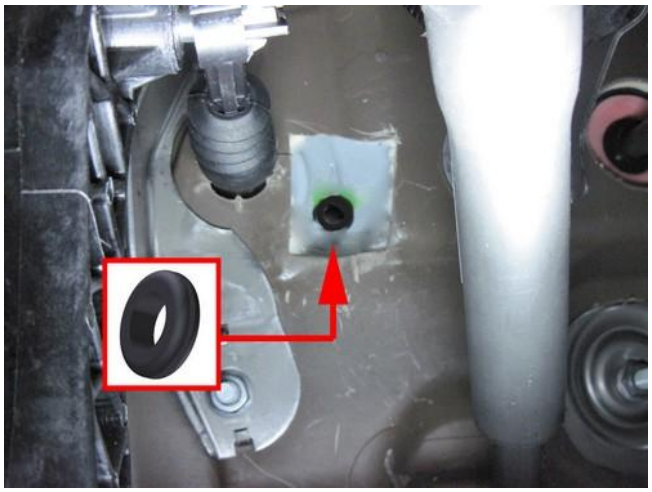
Mount fuse holders to bracket with M6 bolt & spring washer. Mount bracket to original bolt from left head light.



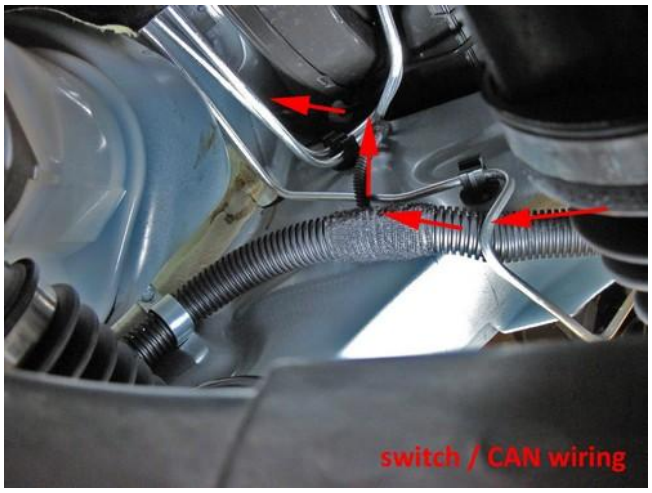
Grommet / wiring transit

Cut away foam under dashboard (see pictures). Mark hole for drilling.

Drill hole Ø10mm and treat anti rust. Mount grommet.



Put wiring through grommet from underneath the car and use a silicone sealant around wiring for a waterproof transit.
Wiring to passenger room: ***Switch / CAN / Wake-up*** / ***Fused +batt.***

Mounting the fuel selection switch / CAN / Wake-up

To connect wake-up, remove control ECU below dashboard on drivers side.

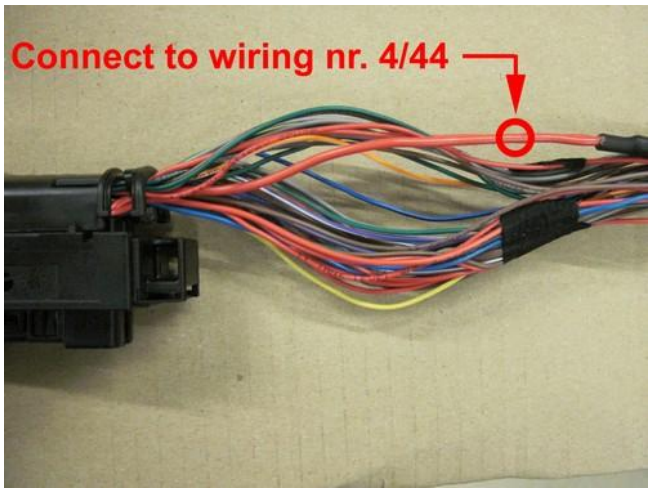
EOBD connector for CAN.

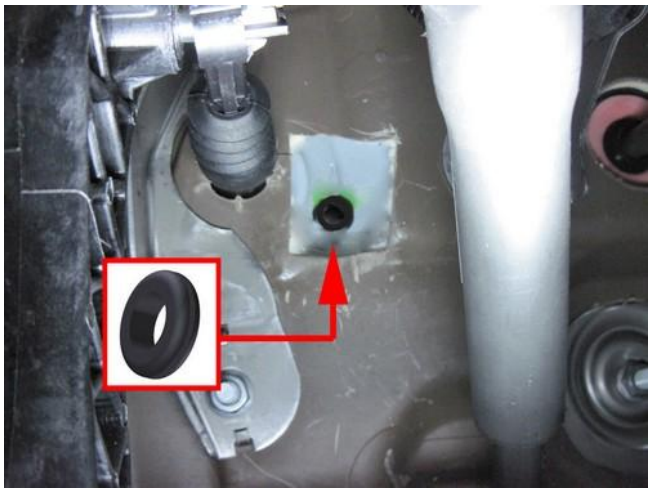
Space for switch

Drill hole 8,3mm for mounting switch. Mount switch with supplied sticker.

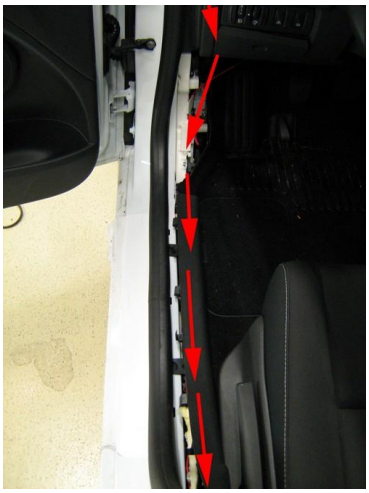
Connecting the fuel gauge reset module 1

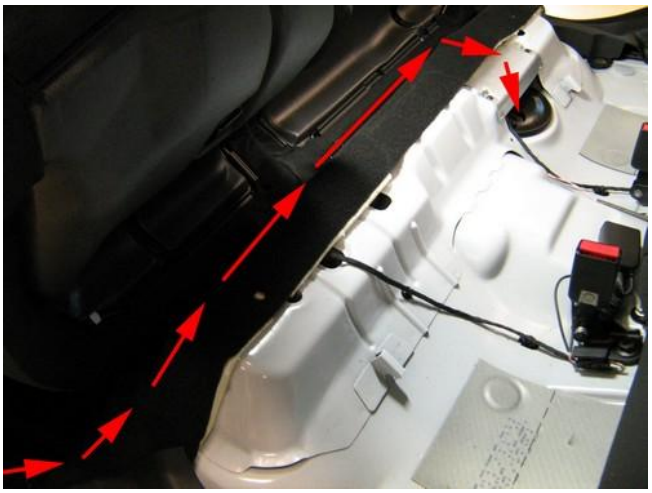
The fuel gauge reset module is mounted underneath the back seat.



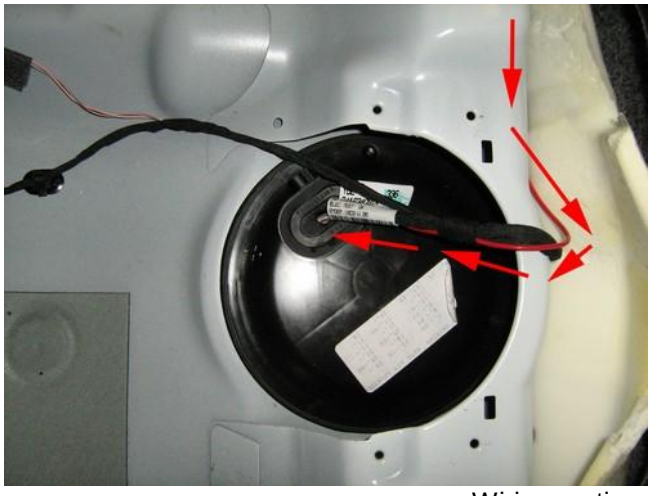
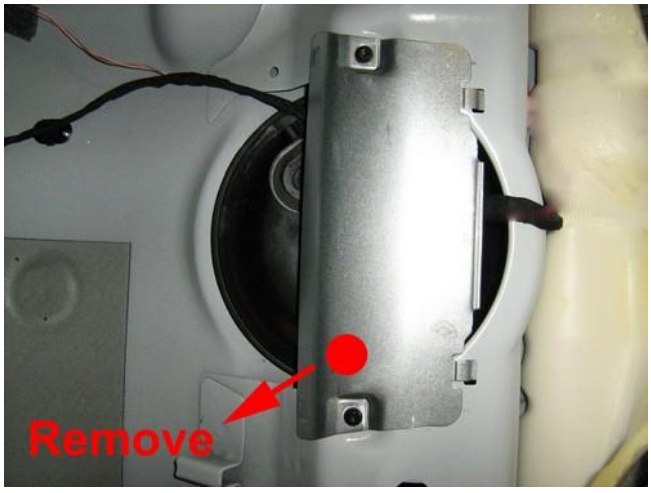


Connect extension wire to wire nr. 4/44 at AFC connector. Stab wiring together with ***Switch / CAN / Wake-up*** through grommet.



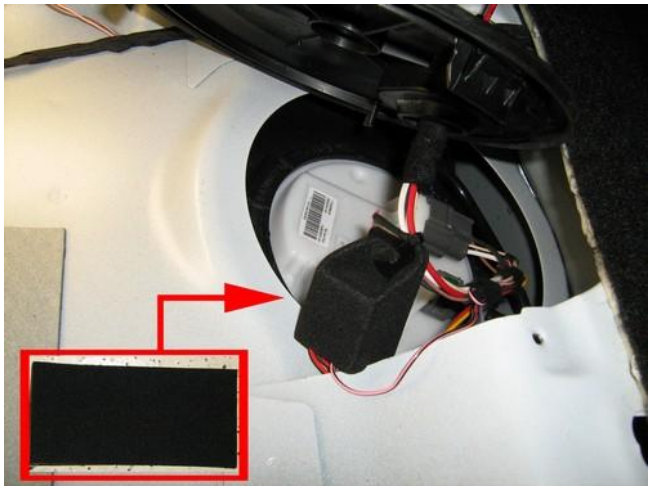


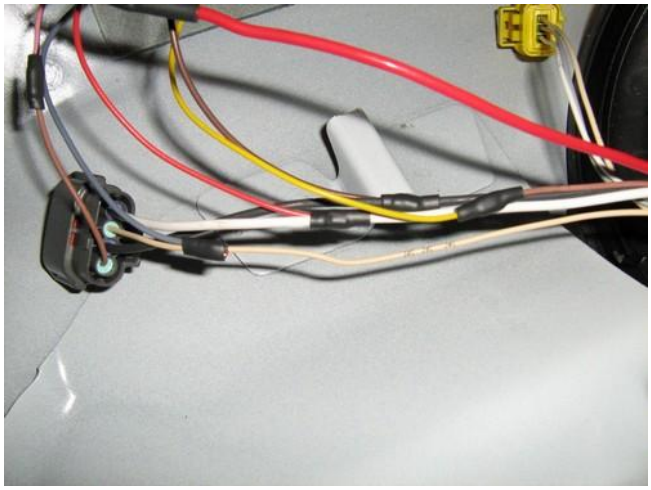
Wiring routing through car. Mount 4.5mm split tube around extension wire.

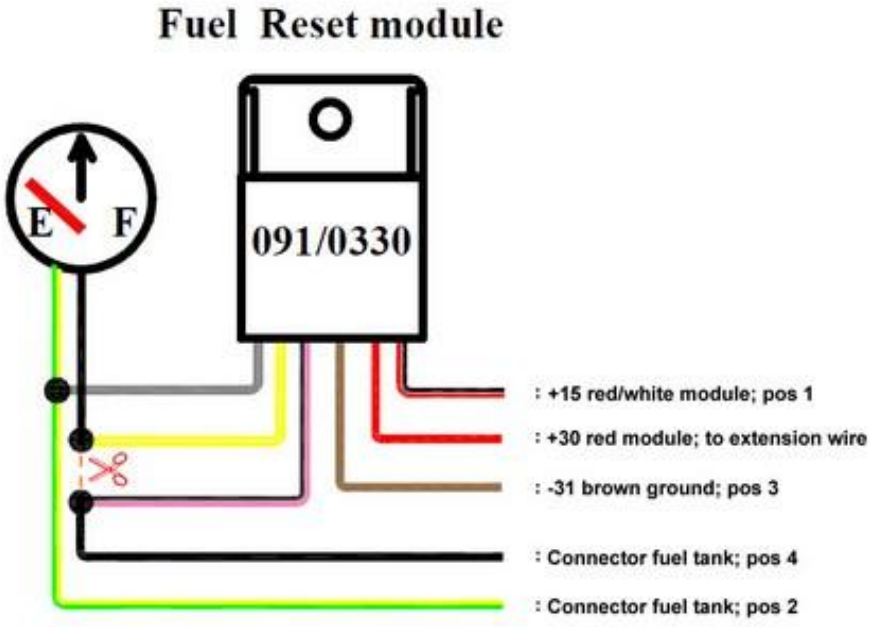
Wiring routing. Remove cover.

Connecting the fuel gauge reset module 2





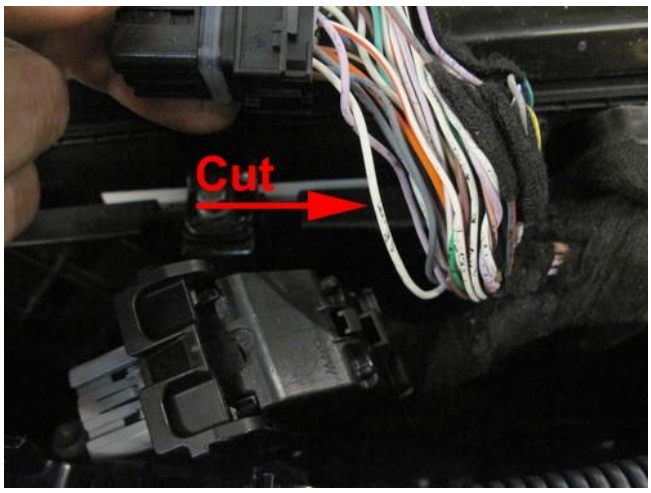
Mount foam around reset module and connect wires to wiring of the fuel tank.
The reset module will be positioned underneath the black cover on top of the fuel pump/tank gauge.



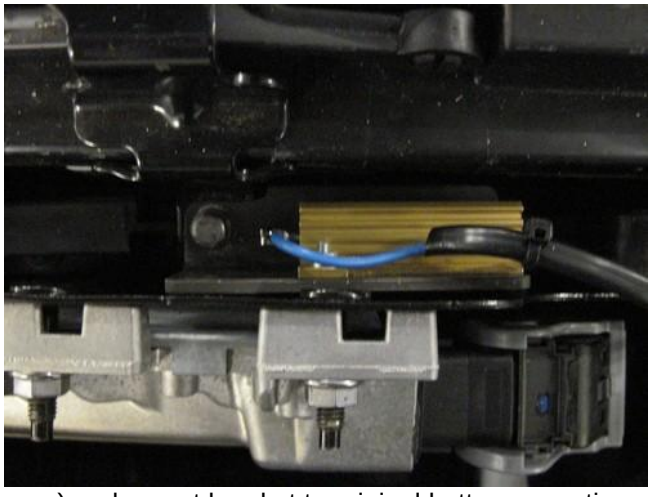
Position 1: White / Position 2: Tan / Position 3: Black / Position 4: Brown

Connect wires to the wiring of the fuel tank and mount back covers and back seat.

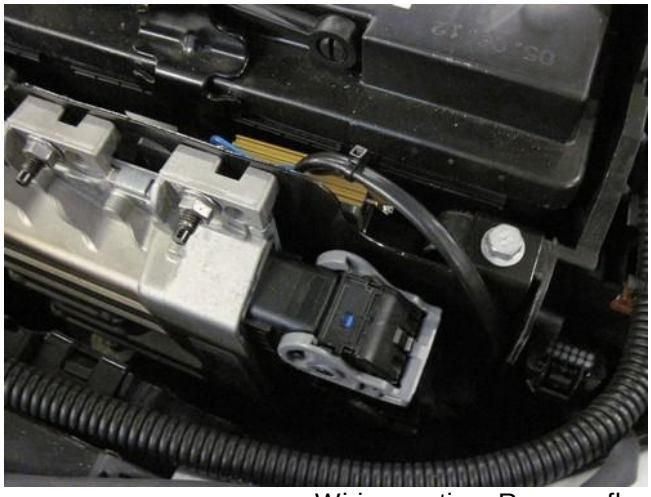
Actuator resistance

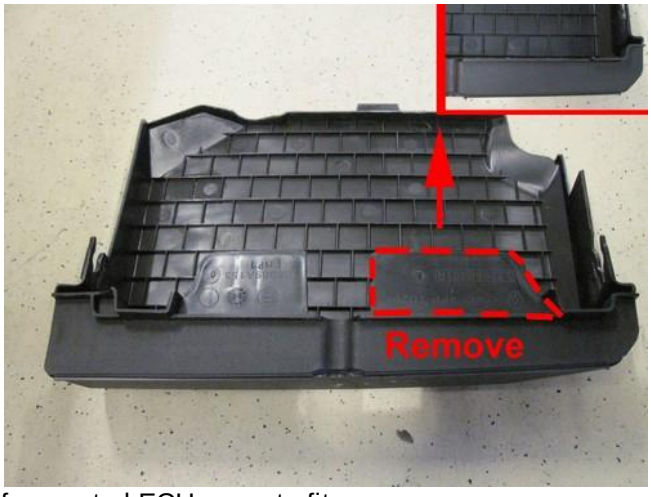


Cut wire from big black connector, Q4, white and connect extension wires.
Mount resistor on bracket with 2x M3 screws and spring washers.



Solder extension cables to resistor (also use shrink sleeves) and mount bracket to original battery mounting.

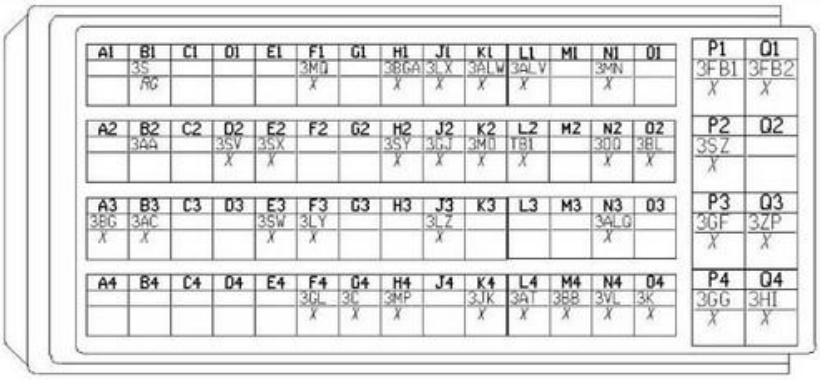




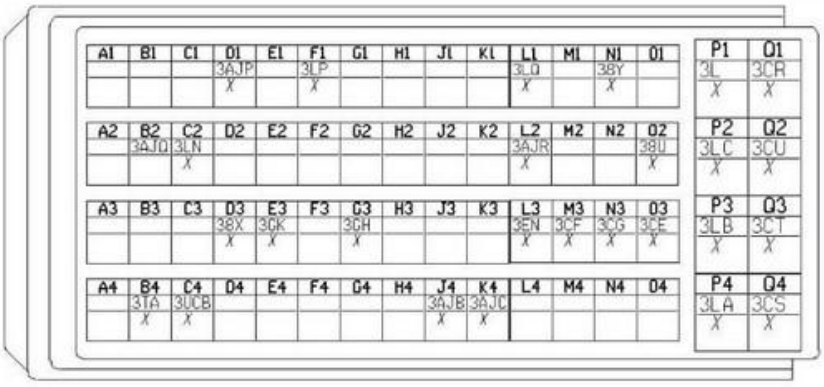
Wiring routing. Remove flap from petrol ECU cover to fit.

Petrol ECU pinnings

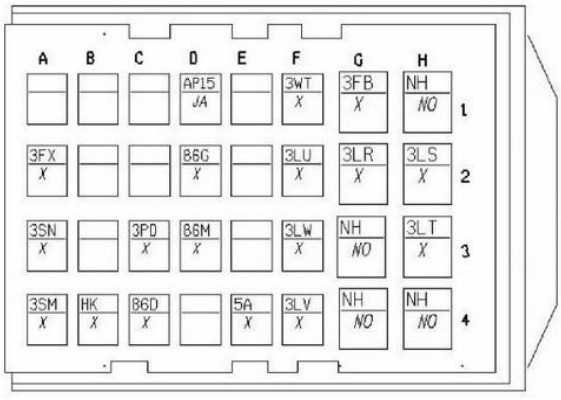
The connectors 1 & 2 are switched on the petrol ECU.
If you have to count from A to Q on the connector, remember: there is no letter " i " on the connector.



Connector 1 (black)



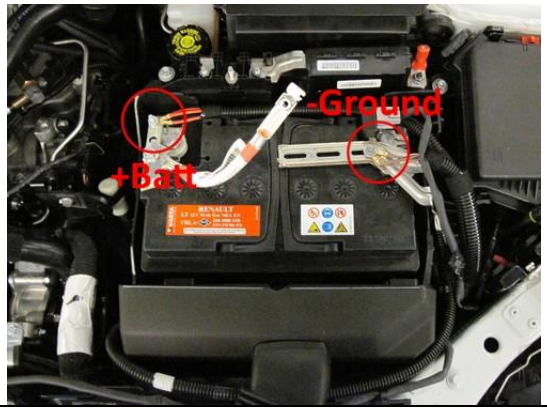
Connector 2 (grey)



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 MAIN GND pump driver MAIN GND boost pump	brown	Connect to the '–' of the battery (-31) ; using ring terminals. Wire location : **ground on battery** 
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 : **+Batt on battery** (see picture above)
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 : **yellow** Wire location : **Connector 3 petrol ECU → D1**
121 Wake-up ***Inside!***	Red-grey	Wire colour : **pink** Wire location : **C21 (control ECU below dashboard, see picture)**  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***
18 Analog 1 25 Simulation 1	Blue-red Green-grey	*High pressure petrol sensor signal interruption* Sensor side. ECU side. Wire colour : **pink-black** Wire location : **Connector 1 petrol ECU → F3**
117 Digital input 3	Yellow-black	*High pressure petrol sensor 5Volt supply* Wire colour : **white** Wire location : **Connector 1 petrol ECU → J1**
19 Analog 4	Blue-white	*High pressure petrol sensor ground* Wire colour : **purple** Wire location : **Connector 1 petrol ECU → J3**

119 Digital input 2	Yellow-grey	insulate
17 Analog 2	Blue-black	insulate
10 Simulation 2	Green-black	insulate
23 Digital Simulation	Green-red	insulate
115 Digital input 4	Yellow-red	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
20 MAP Only use signal wire 20 from MAP wiring. Cut off connector.	Blue: use Red:insulate Brown:insulate	For measuring the inlet manifold pressure from the engine MAP sensor. Wire colour : **green-black** Wire location : **Connector 2 petrol ECU → B2**
8 RPM	Purple-white	For measuring the engine speed signal. Wire colour : **pink-black** Wire location : **Connector 1 petrol ECU → D2**
15 T-ect	Grey	For measuring the engine coolant temperature. Wire colour : **green-red** Wire location : **Connector 1 petrol ECU → G4**
6 Lambda1 WB	Orange	Wire colour : not connected Wire location : not connected
42 Lambda2 WB 10KΩ	Orange-white	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 ***Inside!***	Blue-yellow	EOBD connector pin 6
70 CAN-Low ***Inside!***	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		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.