



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 POMP HIGH PRESSURE PETROL INJECTOR MODEL YEAR: SYSTEM APPROVAL NUMBER (R115) LOCATION R115 SYSTEM STICKER **ENGINE SET NUMBER** MANUAL NUMBER DATE

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Renault Megane Estate 1200cc 16_V H5F (TCe115) M MT(6) AFC-2.1 Continental EMS3150 Denso 166304016R 2012 E4-115R-000012 / DLM-LPG 06 right side, centre door post 359/070009/A 076/1907600 2015-06-19

Version 2013-09-28 D



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FOR EXPLANATION AND CIRCUIT DIAGRAMS SEE: INSTALLATION MANUAL GENERAL PART 1/	12



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General instructions

- The installation of the system shall be done in accordance with the installation manual provided by Prins Autogassystemen.
- This manual is based on Dutch regulations, always install the system in accordance to the local regulations.
- For an optimal functioning of the Direct LiquiMax-2.0 system, maintain a clean and organized work environment during installation and maintenance to prevent pollution of the LPG components.
- Always download the "general manual 1/2" from our website for basic instructions and diagrams.
- Always disconnect the battery when installing / servicing the LPG system. Make sure the ignition key is outside the car.
- Be aware of central door locking, radio / telephone memory code, alarm system.
- Wear safety goggles when working on the petrol filled system / connections (pressurized petrol)
- Do not place the main fuse into the fuse holder before having completed the installation of the system.
- The AFC has to be activated by means of the Prins diagnosis software.
- Never disconnect the AFC connector, unless you have removed the main fuse.
- When installing the wiring harness, ensure that it does not run near any of the ignition components.

Solder and insulate all electrical connections.

The wires in the loom are provided with numbers and text. The text on the wire explains the function of the wire.

The wire harness is not model specific, therefore 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 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 .



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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 (5-50Nm)
- Torque wrench (200-250Nm)
- Portable light
- Assortment drill bits 4 to 12 mm
- Assortment cutters (ø 20, 30, 50, 70 mm)
- Portable drill or pneumatic drill
- Thread cutting device (male M6x1, M8x1, M10x1)
- Air gun
- Vacuum cleaner
- Safety goggles
- Hot air gun
- Soldering iron, soldering tin
- Wire-stripping pliers
- Adhesive tape
- Adhesive sealant
- Thread locking compound
- Anti-corrosion agent / black body coating
- Gas leak detection device or foam leak spray
- Shrink sleeves

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)



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Tightening moments

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

EXPLANATION OF SYMBOLS:



= IMPORTANT, CAUTION

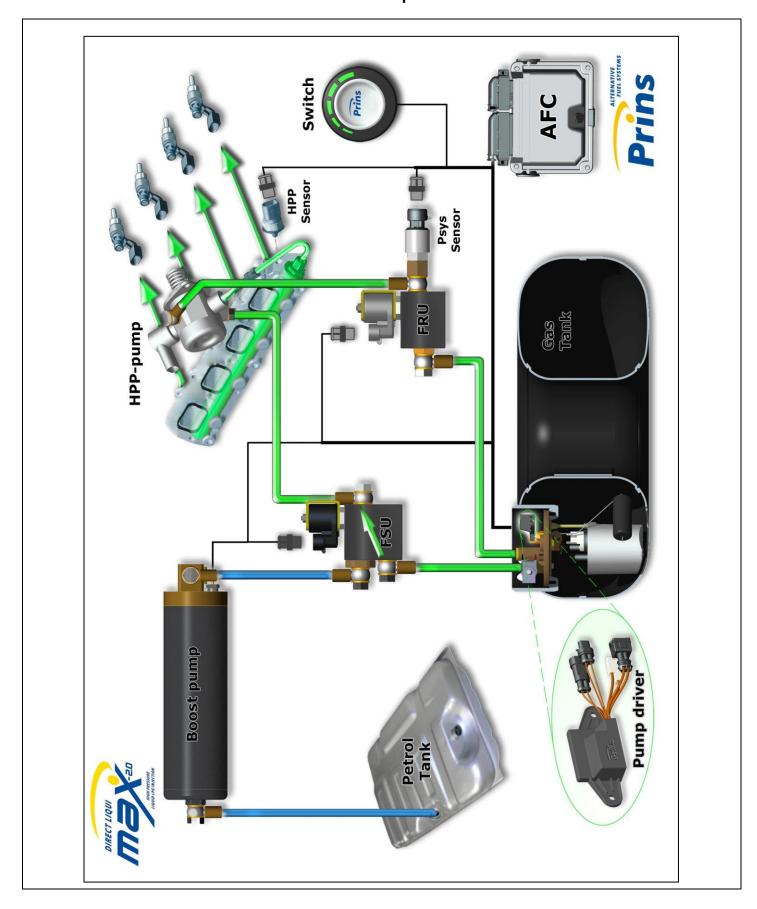




= WEAR SAFETY GOGGLES



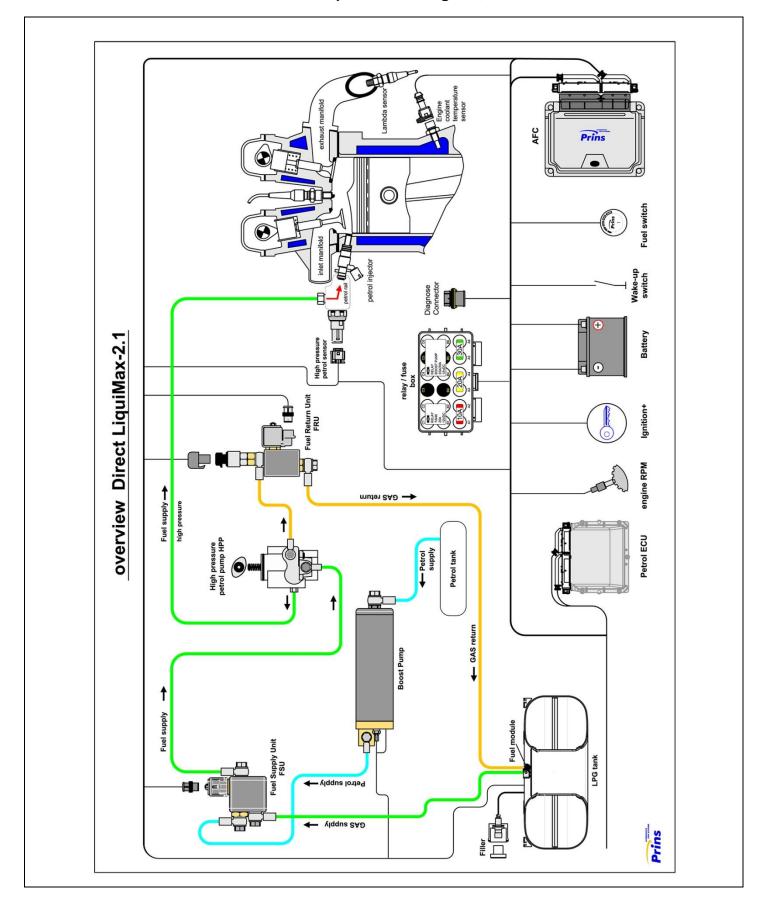
Direct LiquiMax-2.1



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Direct LiquiMax-2.0 diagram, AFC-2.1



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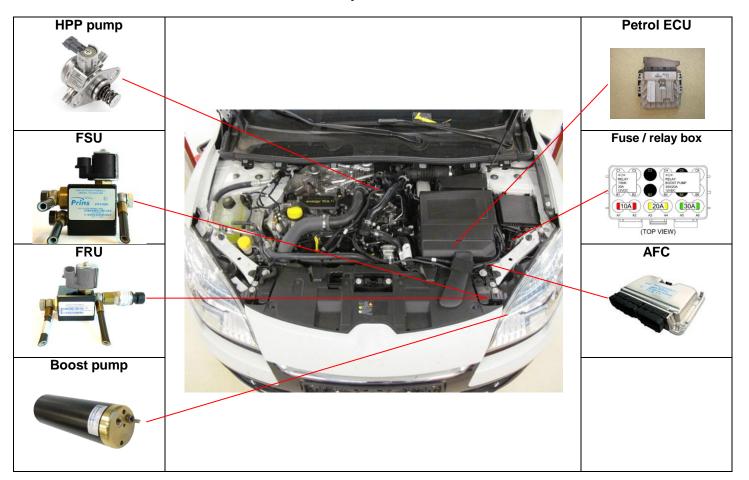
Direct LiquiMax parts / approval numbers

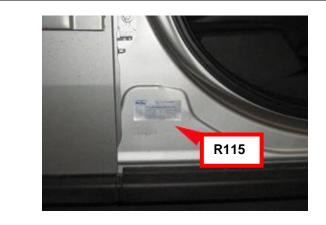




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DLM-2.1 component location overview





R115 approval sticker: Right side centre door post



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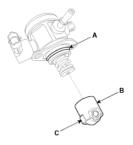
Installation of the Bosch High Pressure Petrol Pump

-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.



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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.





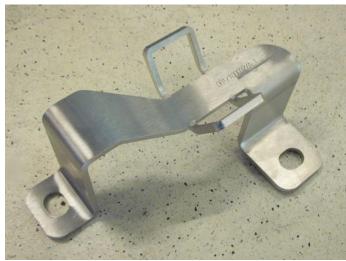
Extend the original wiring by cutting of the original connector. Extend the wiring and connect the new connector. Connect pin 1 from the old connector to pin 1 from the new connector. Mount connector to new HP pump.



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Mounting 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.





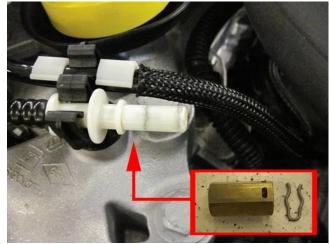
Mount bracket to vehicle below battery on 2 original bolts with big washers, spring washers and nuts.



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Connection of the fuel hose to the boost pump.





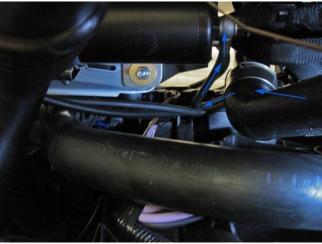
Remove original fuel line to HP pump. Mount adapter to original connection.





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





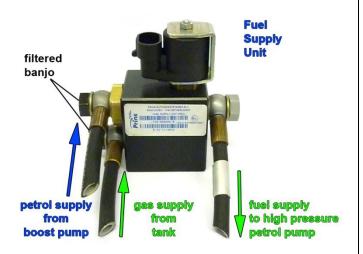
Mount the fuel line (blue arrows) from the adapter to the boost pump. Use a banjo with filter (black) to connect the fuel line to the boost pump.



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Fuel Supply Unit / Fuel Return Unit

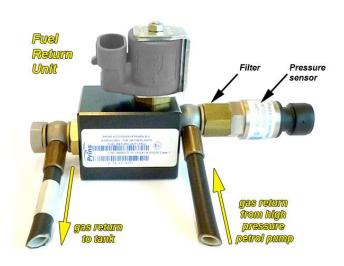




Black filtered banjo will only be used on inlet connections!







Filter inside sensor banjo

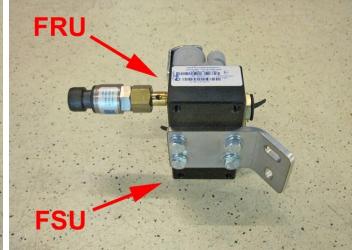




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Mounting the FSU / FRU





Mount the FSU / FRU to the bracket.





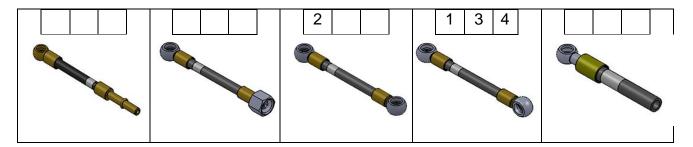
Mount the bracket with FSU / FRU to vehicle with M6 bolts, (spring)washers, and nuts.



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LPG / petrol fuel lines

Hose / size	from	to	Length (cm)
1 XD-3	Adapter original petrol hose	Petrol boost pump	100
2 XD-3	Petrol boost pump	Fuel supply unit	30
3 XD-3	Fuel supply unit	High pressure petrol pump	100
4 XD-3	Fuel return unit	High pressure petrol pump	110





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





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

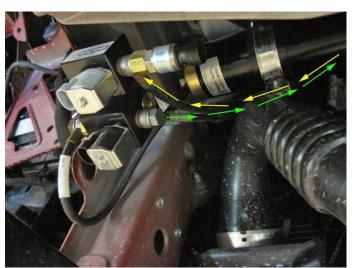


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Hose routing Boost pump / FSU / FRU - 1





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





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Mount hoses from FSU / FRU to HP pump. Mount adapter to HP pump.

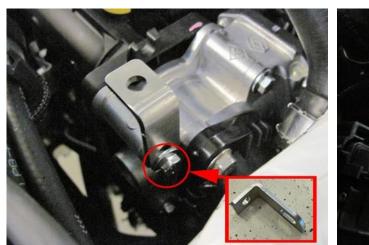


Mount hoses to HP pump.



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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.

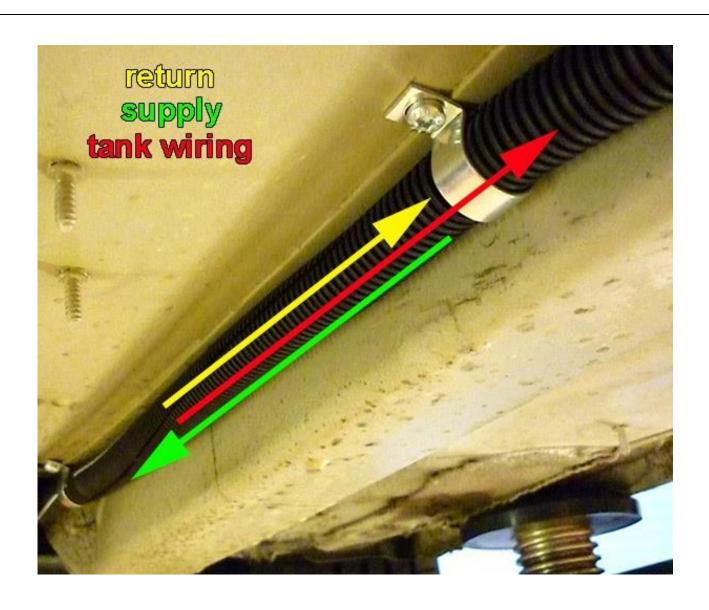




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Supply hose – Return hose – Tank wiring

Protect the supply- and return hose together with tank-wiring using the \varnothing 16 split tube. Mount the "hose assembly " with clamps, with a <u>maximum</u> distance of 40cm.

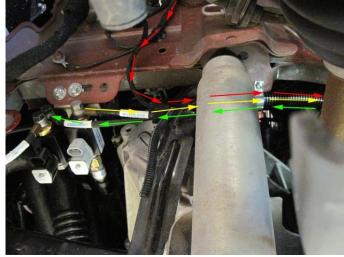




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Hose / wiring routing to tank - 1

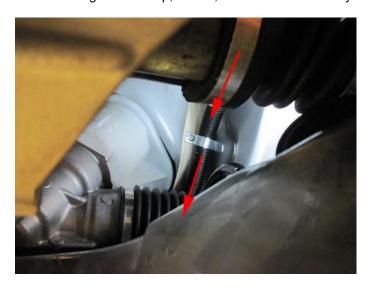








Pull out wiring for wake-up, switch, CAN & fused +Battery.





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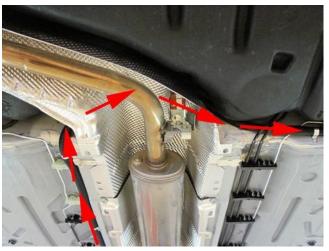
Hose / wiring routing to tank - 2





Cut off original clamps where necessary.





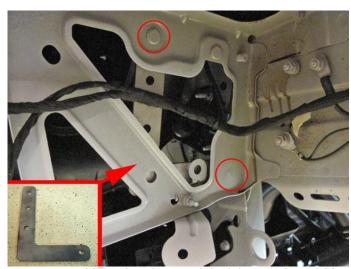


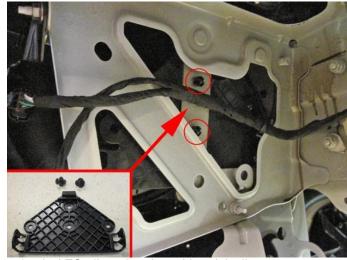




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Mounting the AFC





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Mount bracket to original threaded rods. Mount plastic AFC-clip to bracket with quick clips.

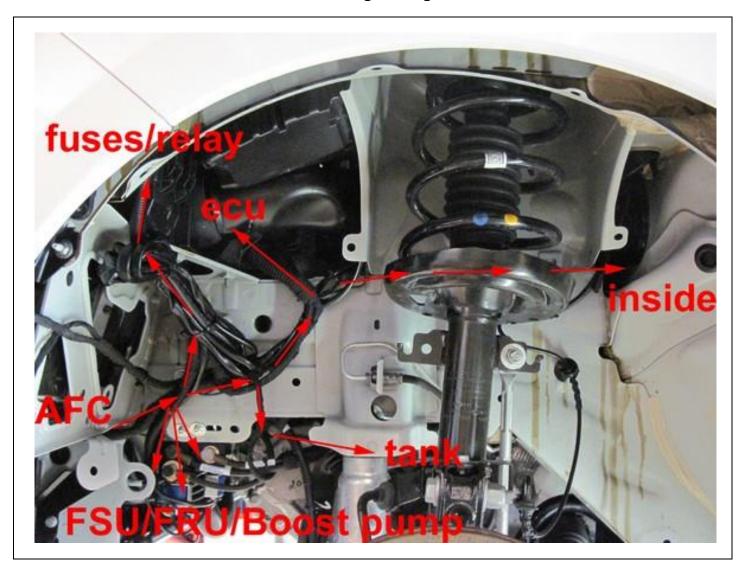


Mount the AFC.



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Wiring routing AFC

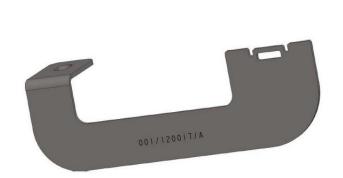






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Fuse/Relais box & diagnostic connector





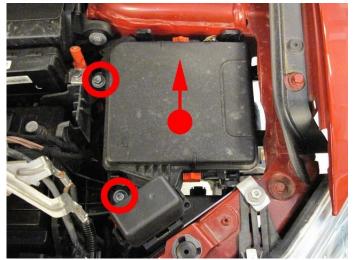
Bracket for fuse/relais box. Mount bracket to original bolt from left head light.





Mount bracket to original bolt from left head light. Mount the box on the bracket.

Mount diagnostic connector to cap from box with a cable tie.



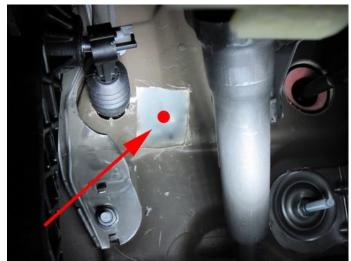
For transferring the box from the AFC to the engine room, lift up fuse box by removing the 2 bolts (see picture).



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Grommet / wiring transit





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





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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.



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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





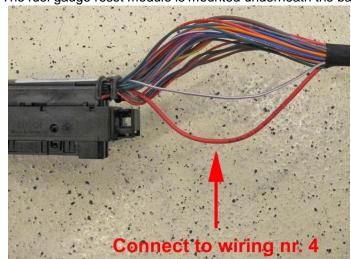
Drill hole 8,3mm for mounting switch. Mount switch with supplied sticker.



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Connecting the fuel gauge reset module 1

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

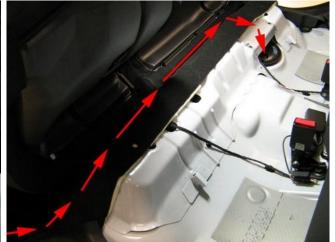




Connect extension wire to wire nr. 4 at AFC connector. Stab wiring together with **Switch / CAN / Wake-up** through grommet.







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



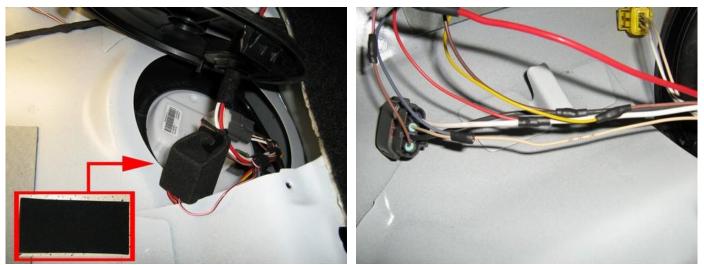


Wiring routing. Remove cover.



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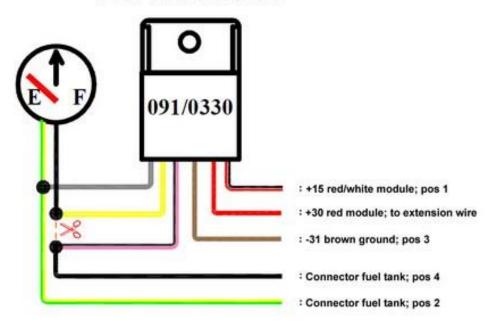
Connecting the fuel gauge reset module 2



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.

Fuel Reset module



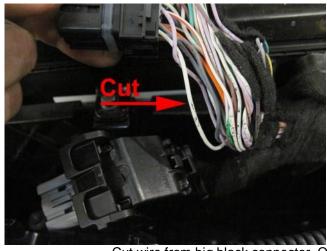
Position 1: White / Position 2: Tan / Position 3: Black / Position 4: Brown

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



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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.

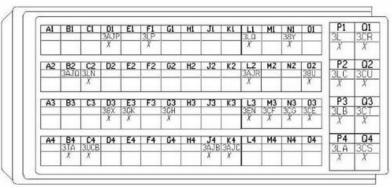


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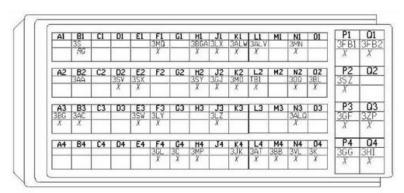
Petrol ECU pinning



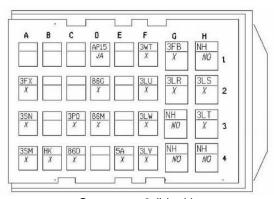
If you have to count from A to Q on the connectors, remember: there is no letter "i" on the connector.



Connector 1 (grey)



Connector 2 (black)



Connector 3 (black)



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Electrical connections

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

Driver room / inside

Wire	number/ code	Wire colour	Connection	
3-po 66 3 49	le micro connector Ground fuel switch +12V fuel switch LIN fuel switch	Brown-black Red-white Yellow	Connect the 3-pole connector to the I	Prins fuel selection switch.
			harness side	switch side
			"CL	ICK"

51	CAN-High	Yellow	EOBD connector pin 6
70	CAN-Low	Green	EOBD connector pin 14

40 <u>Inside!</u>	Wake-up	Red-grey	Car wake-up Wire colour: pink Wire location: C21 (control ECU below dashboard, see picture)
			See page 27



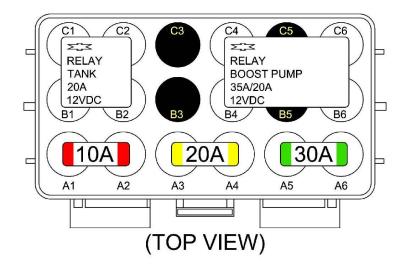
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Electrical connections

Check and measure the wiring in case of changes in the cars wiring colours.

Insulate not used wires.

1-32 MAIN GND ecu MAIN GROUND SENSE	Brown	Connect to the '-' of the battery (-31); use a ring terminal. Wire location : ground on battery
		-Green



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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
36&25		High pressure petrol sensor signal interruption
		Wire colour : pink-black
		Wire location : Connector 2 petrol ECU → F3
36 AD 6	Blue-brown	Sensor side
25 DAC 1	Green-white	Petrol ecu side

63	Ground Shift	Blue-orange	High pressure petrol sensor ground Wire colour: purple Wire location: Connector 2 petrol ECU → J3
60	DI3	Grey-red	High pressure petrol sensor 5Volt supply Wire colour: white Wire location: Connector 2 petrol ECU → J1
8	RPM engine speed	Purple-white	For measuring the engine speed signal. Wire colour : pink-black Wire location : Connector 2 petrol ECU → D2
15	T-ect	Grey	For measuring the engine coolant temperature. Wire colour : green-red Wire location : Connector 2 petrol ECU → G4
18	AD 1	Blue-white	For measuring the inlet manifold pressure from the MAP sensor Wire colour: green-black Wire location: Connector 1 petrol ECU → B2
7	+12V IGNITION	Grey - white	Make a connection to +ignition / contact+ (+15). Do not place the fuses in the holder before having completed the installation of the lpg system. Wire colour: yellow Wire location: Connector 3 petrol ECU → D1

2-core wire from actuator resistor	Wire colour: White Wire location: Connector 2 petrol ECU → interrupt wire Q4 and connect the 2 resistor wires. Both ways possible.
See page 29	Cut



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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	
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	Yelow-blue	insulate
74	DAC 3	Green-pink	Insulate
			Insulate additional loose wires!

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Electrical connections

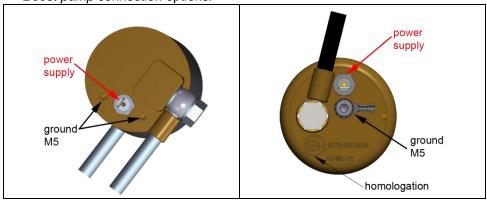
Check and measure the wiring in case of changes in the cars wiring colours. Insulate not used wires.

Engine room

	Engine room					
		Wire colour				
3-pole connector			Connect the 3-pole connector to the Psys sensor positioned into the Fuel Return Unit.			
35	Ground Psys pin A	Brown	Sensor wire pin A			
9	+5V sensor pin B	Red-blue	Sensor wire pin B			
16	Psys pin C	Green	Sensor wire pin C			
2-pole connector FSU, black						
24	+ Lock-off FSU	Yellow-green	Connect the 2-pole connector to the lock-off valve			
31	C Ground	Brown-black	of the Fuel Supply Unit			
2-po	le connector FRU, grey					
43	+ Lock-off FRU	Red-white	Connect the 2-pole connector to the lock-off valve			
34	C Ground	Brown-black	of the Fuel Return Unit			
4-pole diagnose connector			Diagnose connector for service / diagnosis			
46	Service TxD	Grey	Connector pin 1			
65	Service RxD	Grey	Connector pin 2			
68	C Ground	Brown-black	Connector pin 4			
Boos	Boost pump relay					
2	+ relay boost pump	Red-white	Pin 86 of the boost pump relay C4			
26	Ground BP relay	Purple-blue	Pin 85 of the boost pump relay B6			
	+12V fused BATT	Red 2.5mm2	Pin 30 of the boost pump relay C6-A5			
	+12V Boost pump	Red 2.5mm2	Pin 87 of the boost pump relay B4			
Wiring tank pump driver relay						
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			

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Boost pump connection options:





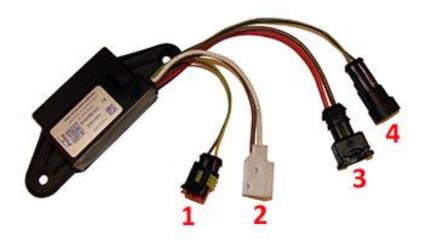
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Electrical connections

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-р	ole tank level connector		
33	Ground tank gauge	Brown-black	Connect the 3-pole connector to the tank level sensor.
12	Tank level in	Blue	
11	+ tank level supply	Red-blue	
2-p	ole driver connector		
71	LSS 3 PWM driver	Purple-pink	Connect the 2-pole connector to the pump driver (4).
64	AD 5 driver diagnose	Blue-grey	
1.	2-pole connector tank lock-off	Green-yellow	From tank pump driver
		Brown	From tank pump driver
2.	3-pole connector tank pump	Red 2.5mm ²	From tank pump driver
	, ,	Brown 2.5mm ²	From tank pump driver
2	2 note connector newer driver	Red 2.5mm ²	From took numn relev
3.	2-pole connector power driver	Brown 2.5mm ²	From tank pump relay
		Brown 2.5mm	From main ground
4.	2-pole connector driver	Green	From AFC pin 71 pwm
		Grey	From AFC pin 64 diagnose





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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!!).

- 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.
- 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.

