ALTERNATIVE FUEL SYSTEMS

Prins

Installation manual
Dedicated
PART 2/2

MANUFACTURER	Skoda / Volkswagen / Seat
TYPE	Octavia Mk3 / Golf Mk7 / Leon Mk3
ENGINE DISPLACEMENT	1197cc / 1395cc
NUMBER OF VALVES	16V
ENGINE CODE / NUMBER	1.2 CJZA CJZB / 1.4 CPTA / 1.4 CXSA / 1.4 CHPA
VEHICLE CATEGORIES	M
TRANSMISSION	MT
AFC VERSION / SYSTEM	**AFC-2.1 / DLM Gen3**
PETROL ECU MANUFACTURER / CODE	Bosch Med 17.5.21
HIGH PRESSURE PETROL POMP	Hitachi
HIGH PRESSURE PETROL INJECTOR	Bosch HDEV-5-2 0261500132
MODEL YEAR:	2013-2015
SYSTEM APPROVAL NUMBER (R115)	X
LOCATION R115 SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	366/071201/A * 366/071211/A * 366/071221/A * 366/071231/A
MANUAL NUMBER	076/3602800
DATE	2017-05-16

Version 2013-09-28D

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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 Gen3 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.
- When working on the car, beware of moving and rotating parts in the engine compartment (even when the engine is not running !!).
- 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 and 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 debris has been removed (especially when mounting an exterior filler into body work).
- After having completed the installation, check the whole system for LPG leakage; use a gas 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’s 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 the system (with warranty card) on the Prins warranty portal within 14 days after installation.

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

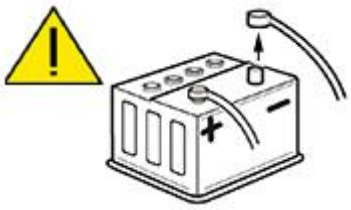
- Check the vehicle drivability on petrol
- Check the fuel system for error codes (scan tool)
- Check if the catalytic converter is in good condition (exhaust gas analyzer)
- Check the condition of the ignition system (spark plugs, cables, coil)

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
Hitachi HPP cover		**220**	46

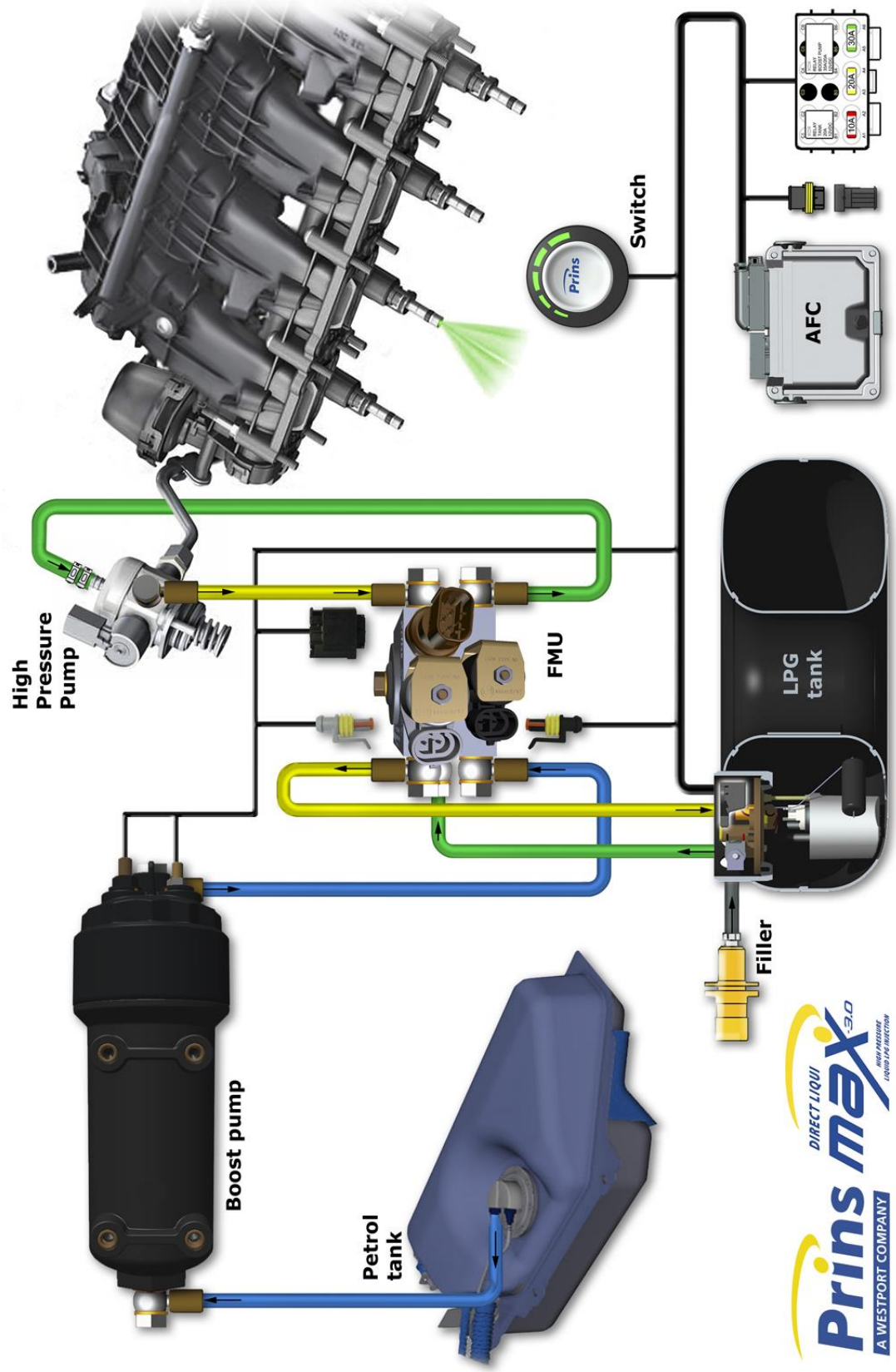
EXPLANATION OF SYMBOLS :

= IMPORTANT, CAUTION



= WEAR SAFETY GOGGLES

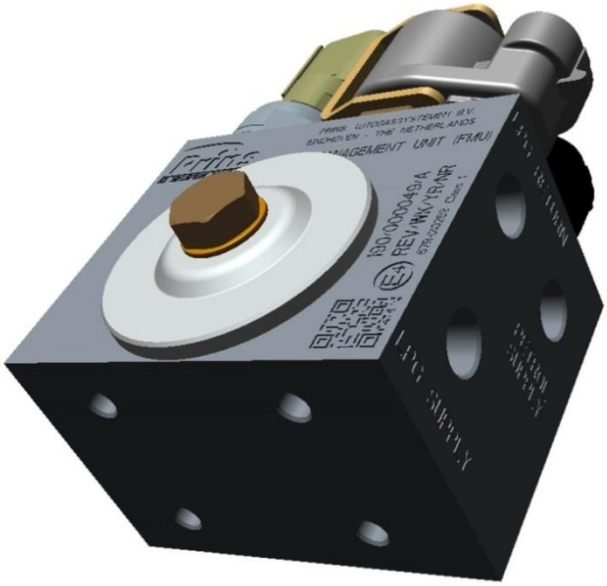
Overview DLM Direct Injection



Direct LiquiMax parts / approval numbers

	
Fuel Management Unit : E4-67R-010269	Boost pump
	
Prins AFC: E4-67R-010098 E4-10R-030507	High Pressure Pump : E4-67R-010266 High Pressure Rail : E4-67R-010267 High Pressure Injectors : E4-67R-010309
	
	Fuel lines XD-series : E4-67R-010247

Fuel Management Unit connections



Fuel Management Unit

Boost pump

DLM component location overview

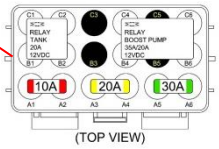
HPP pump

Petrol ECU

FMU

AFC

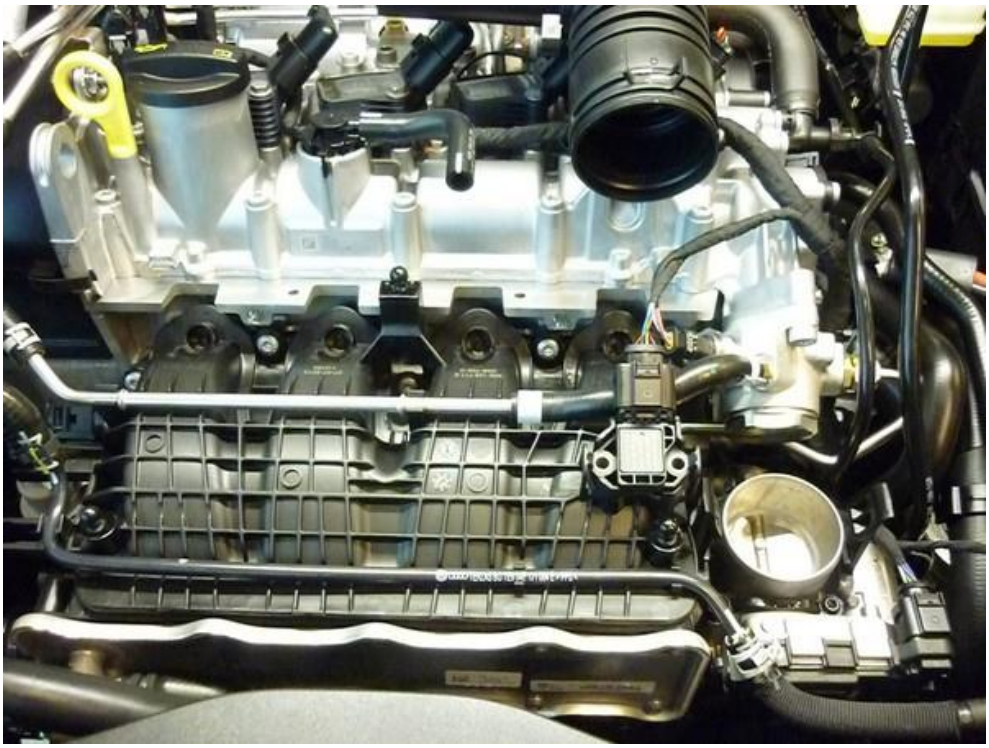
Fuse / relay box

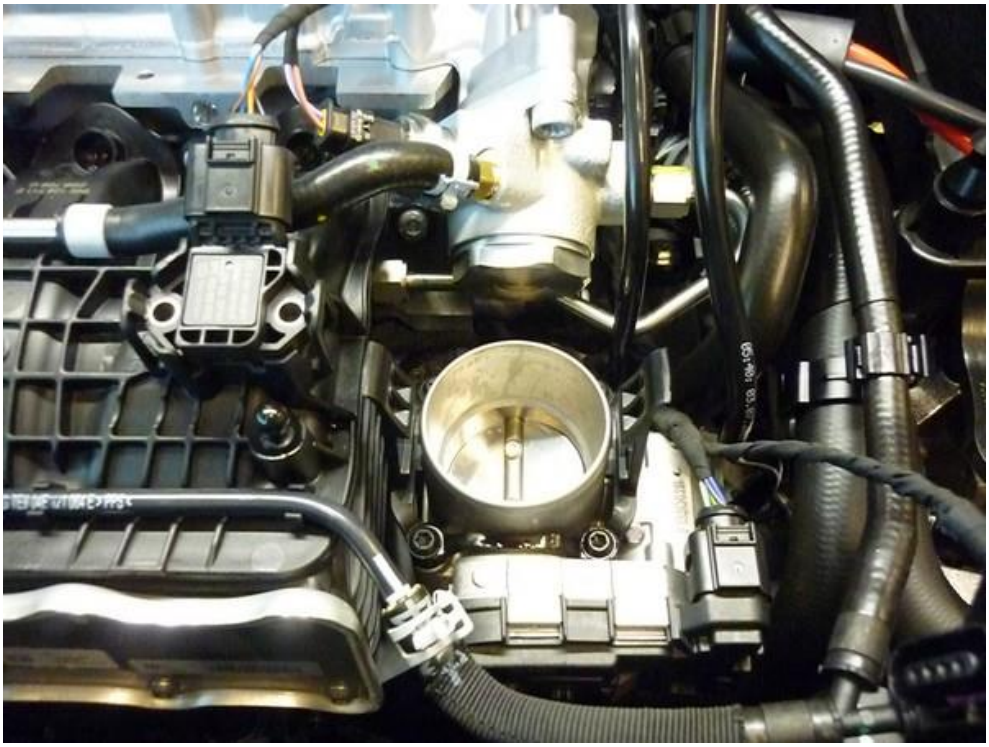


Boost pump

R115 i.a. approval sticker :
Right side centre door post

Remove air box and throttle body

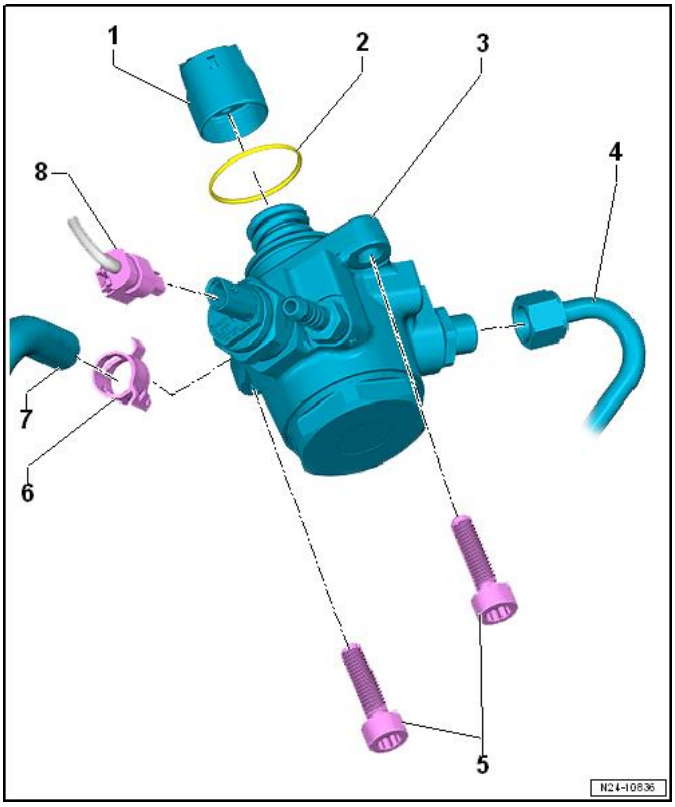




Adapt air intake

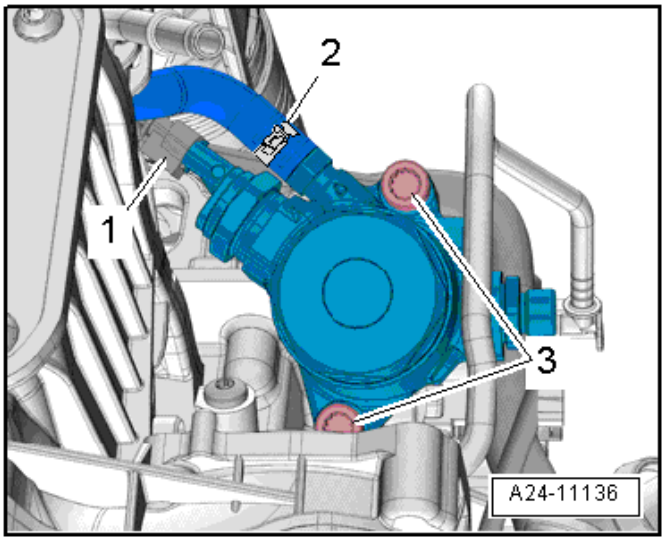
Cut off hose clip.

Removal / installation High Pressure Petrol Pump



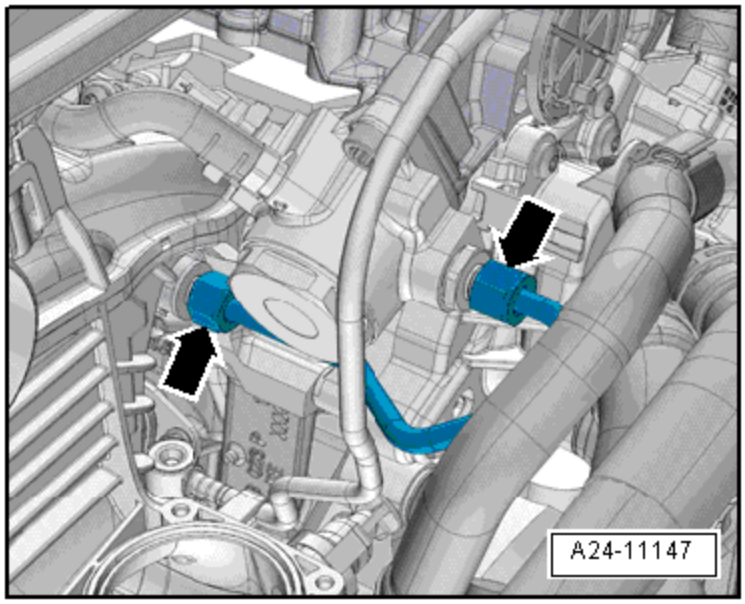
WARNING
Risk of injury due to highly-pressurised fuel.

1.Roller tappet
2.O-ring When installing lubricate lightly with clean engine oil.
3.High-pressure pump
4.High-pressure pipe



Stage	Pump Bolts torxs	Specified torque/ additional specified angle
1.	-5-3-	Screw in to contact by hand
2.	-5-3-	Tighten one turn alternately until flange of high-pressure pump makes contact with camshaft housing.
3.	-5-3-	20 Nm
4.	-5-3-	Turn 90° further

Fuel pipe



Removing and installing high-pressure pipe

Removing

– Remove throttle valve module

WARNING

Risk of injury due to very highly-pressurised fuel.

The fuel pressure in the high-pressure area of the injection system must be reduced to a residual pressure

Caution

Danger of functional impairment due to contamination/soiling

Place a cloth underneath to catch escaping fuel.

– Unscrew union nuts -arrows- and detach high-pressure pipe.

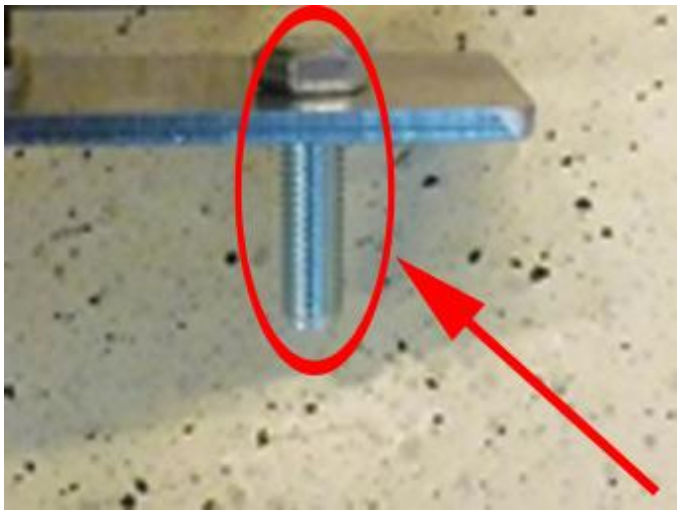
Installation

is carried out in the reverse order; note the following:

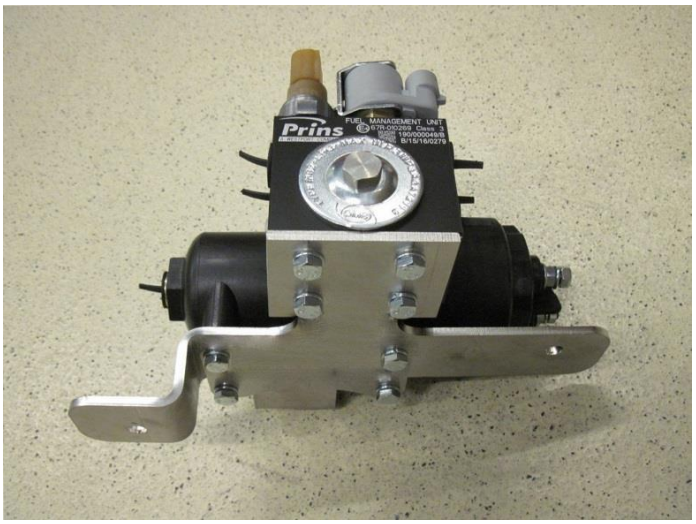
– Lubricate thread of union nuts with clean engine oil.
– Hand-tighten union nuts for high-pressure pipe (make sure that pipe is not under tension).
– Tighten union nuts.
– Install throttle valve module

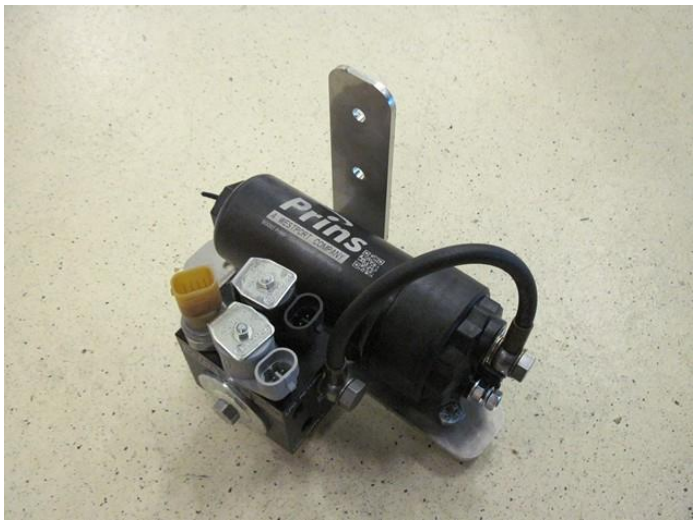
Specified torques

Installation of the DLM system onto the bracket



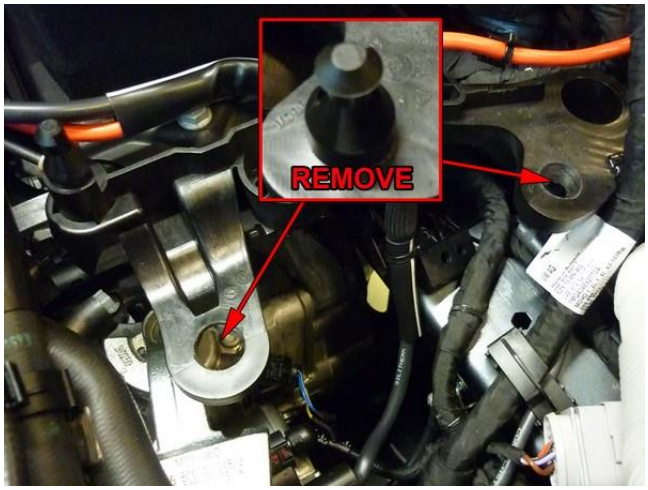
Install M8 bolt before mounting the boost pump !

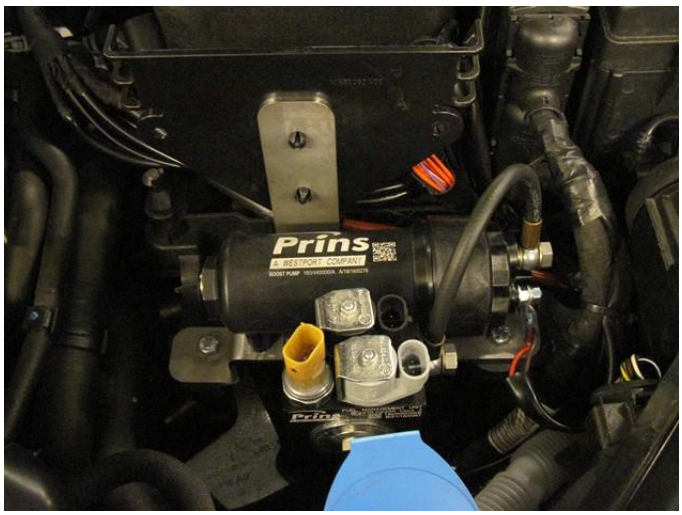


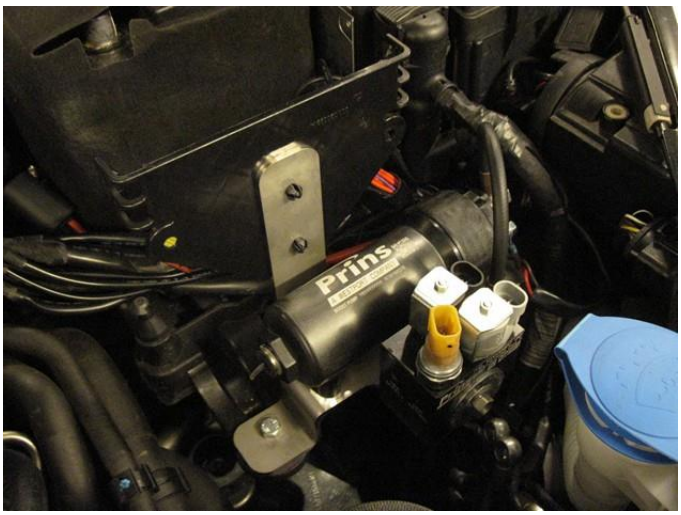


Mount the fuel line between the boost pump and the FMU.

Mounting the DLM system bracket

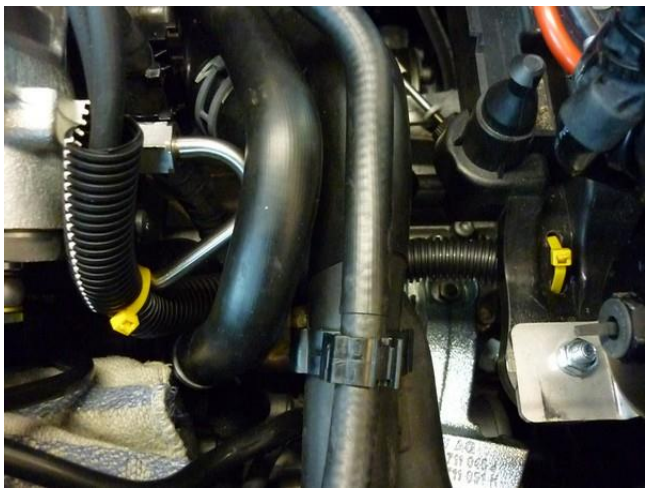


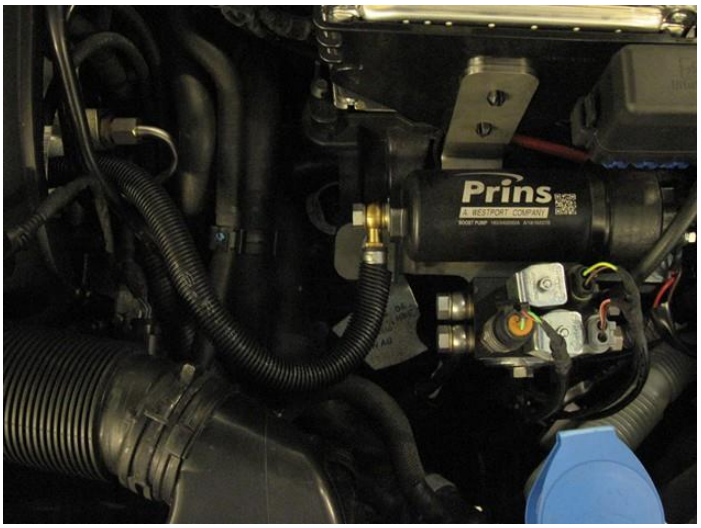




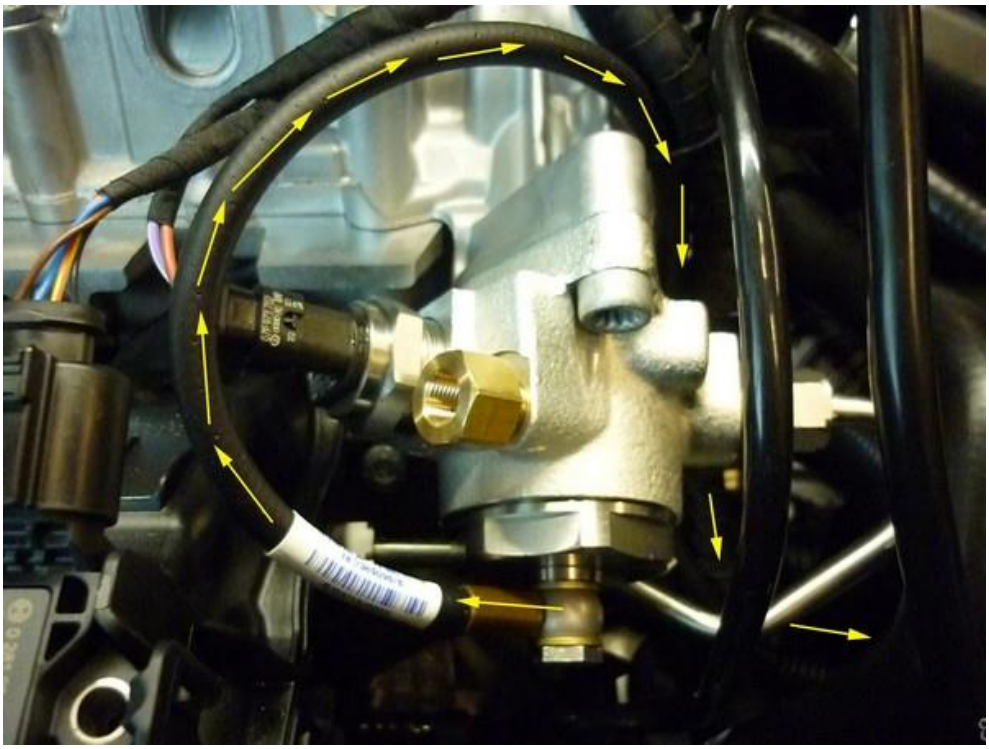
Bolt on the bracket with big washer plates on the underside.

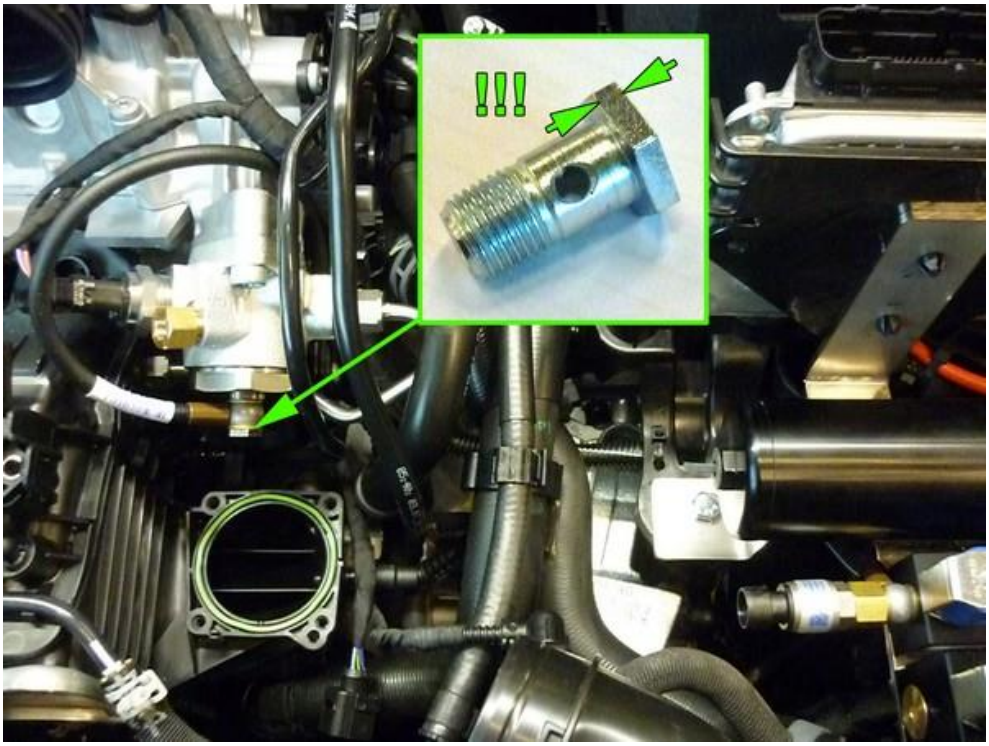
High pressure petrol pump LPG Supply and Return hose





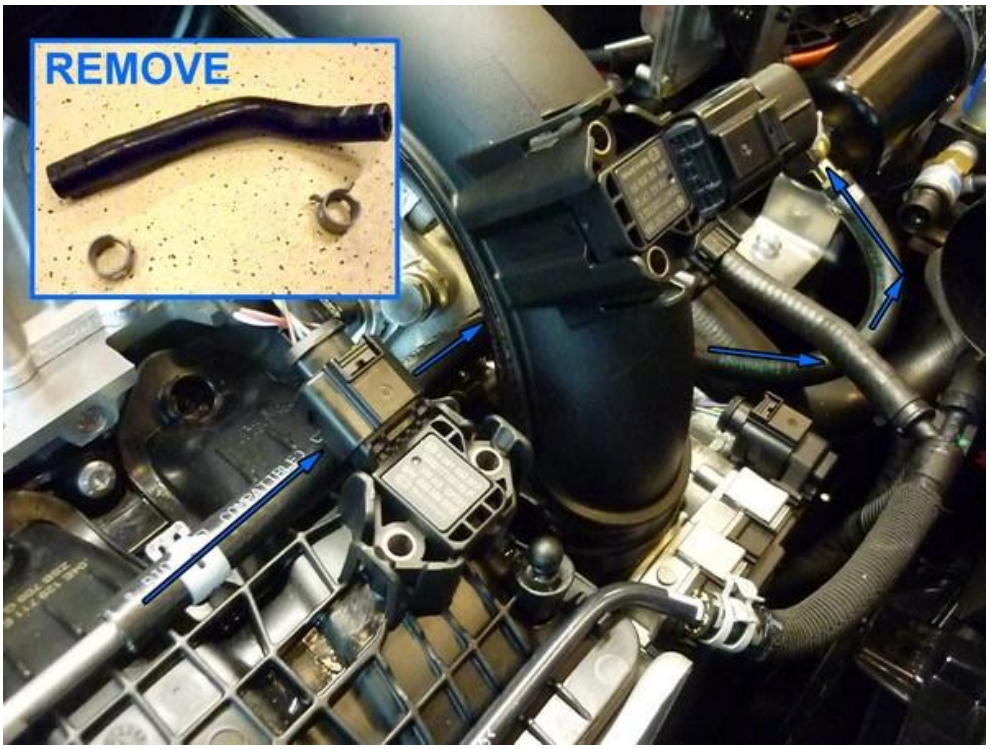
High pressure petrol pump LPG Supply and Return hose





SMALL BANJO BOLT !!!

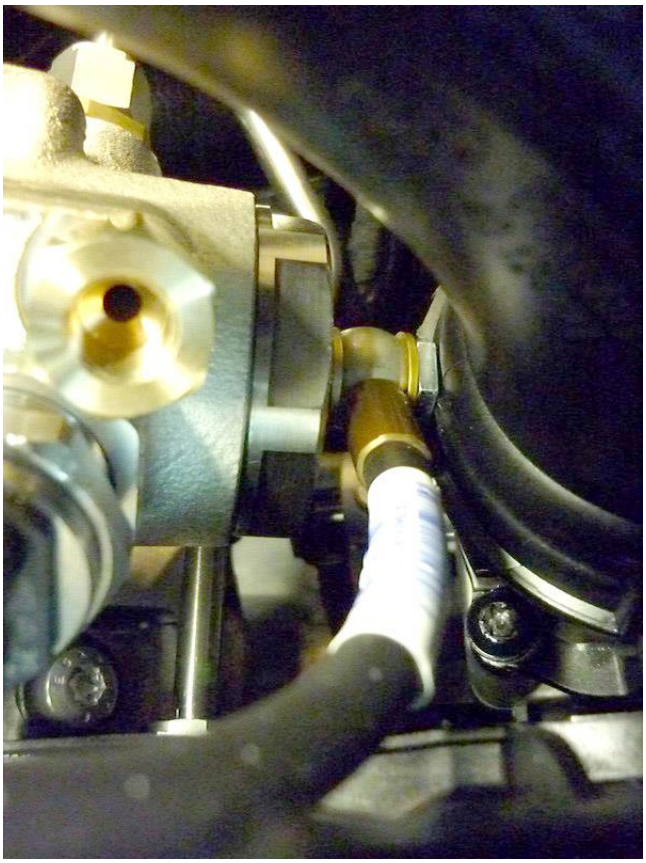
Boost pump Supply

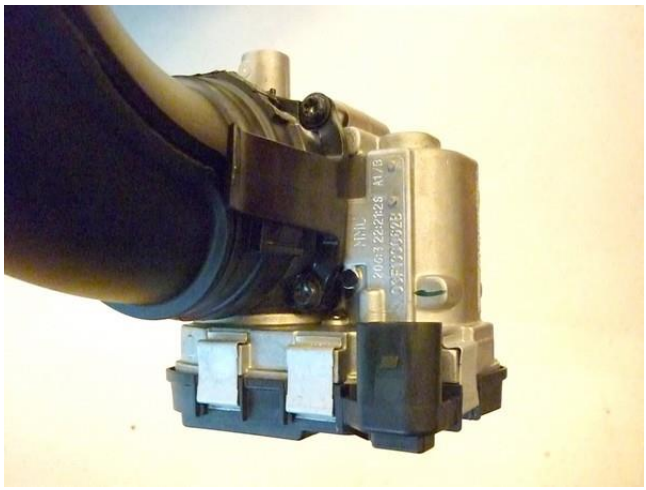


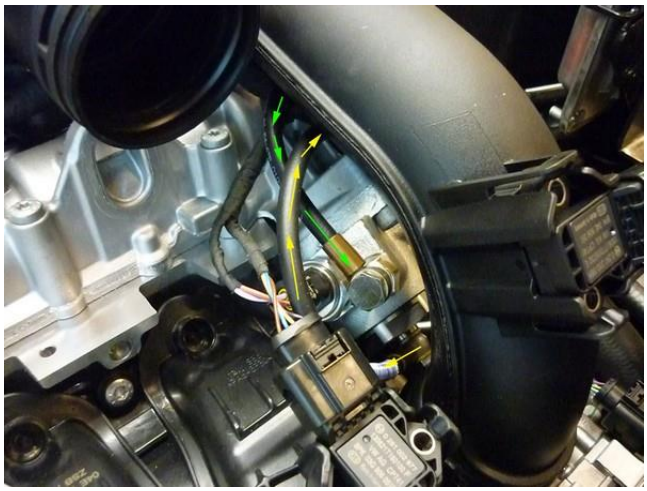
Remove original hose and install the new longer hose (45cm)
Install on boost pump side a XD5 banjo eye with clamp 15.3 onto the hose.

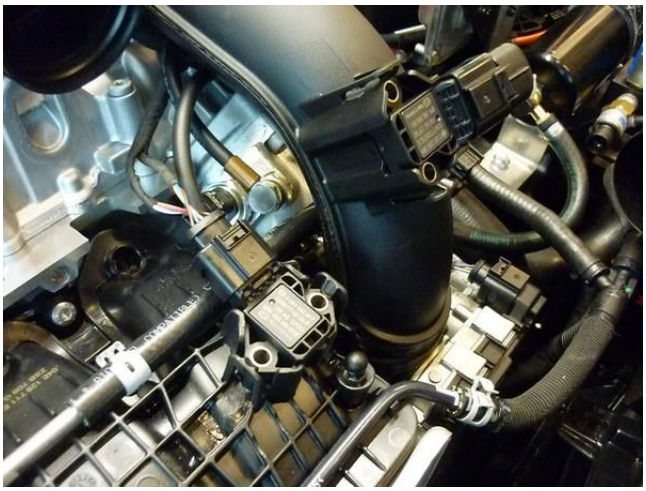
Installation of air inlet pipe with throttle body

Install the pipe WITH the throttle body together onto the air intake manifold.

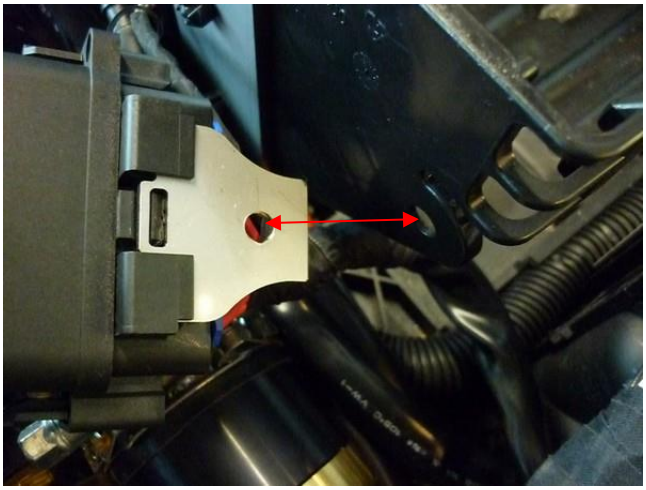




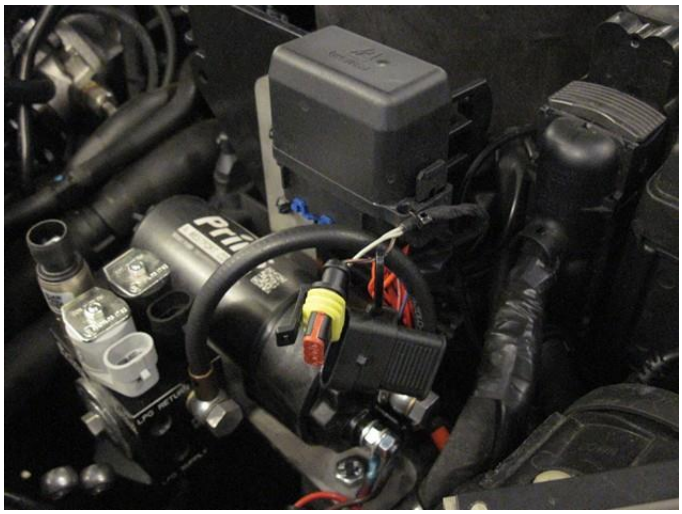


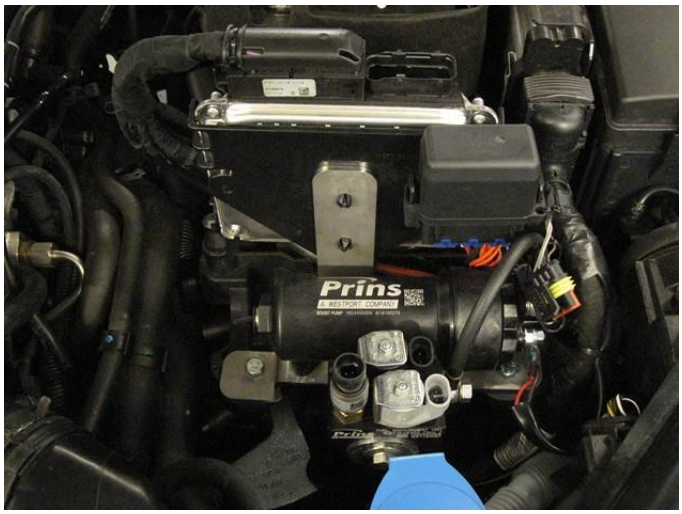


Mounting the DLM fuse box



Bolt with (spring or jagged) washer.

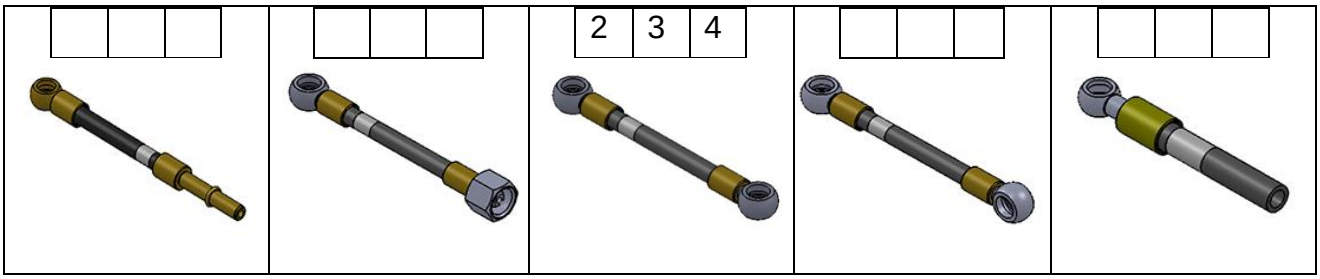




With AFC clip mounted onto bracket.

Lpg / petrol fuel lines

	Hose	from	to	Length (cm)
1	flex fuel hose	Original petrol pipe	Boost pump in	45
2	XD-3	FMU HPP supply	High pressure pump	70
3	XD-3	Boost pump out	FMU petrol supply	20
4	XD-3	High pressure pump	FMU HPP return	70



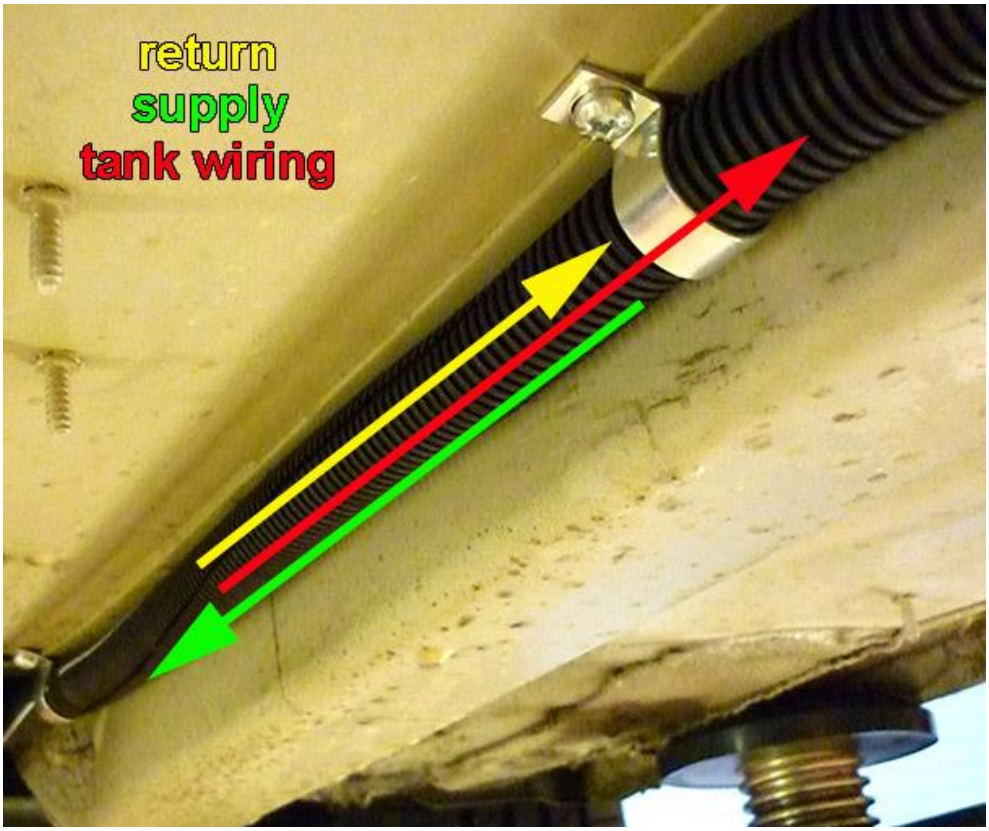
Install the fuel lines using two bonded seal washers and banjo bolt :

Hose routing to tank

This is an example picture from DLM-2.0, for DLM Gen3 the same routing is used,

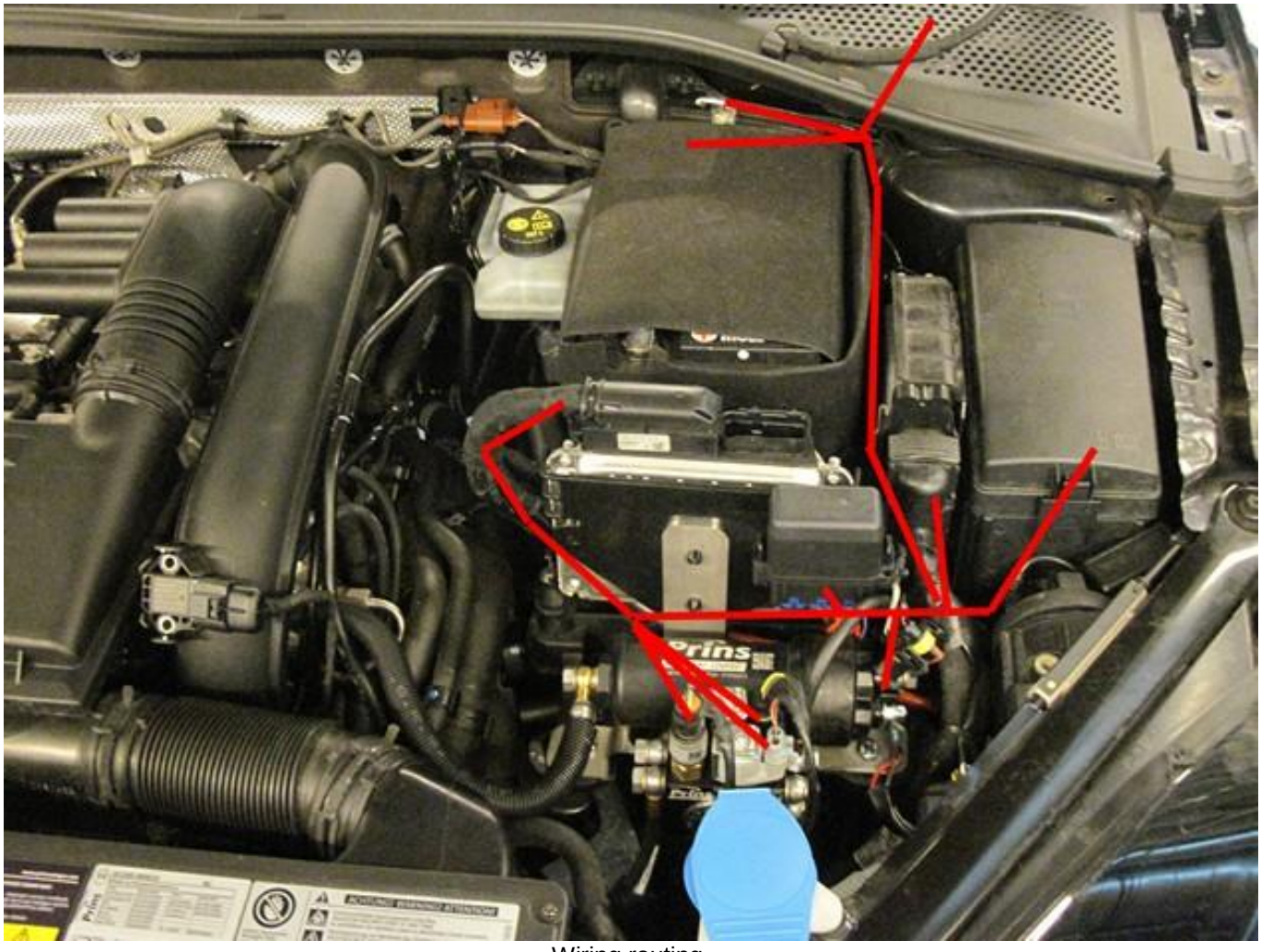
Supply hose – Return hose – Tank wiring

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.



Wiring

Grommet



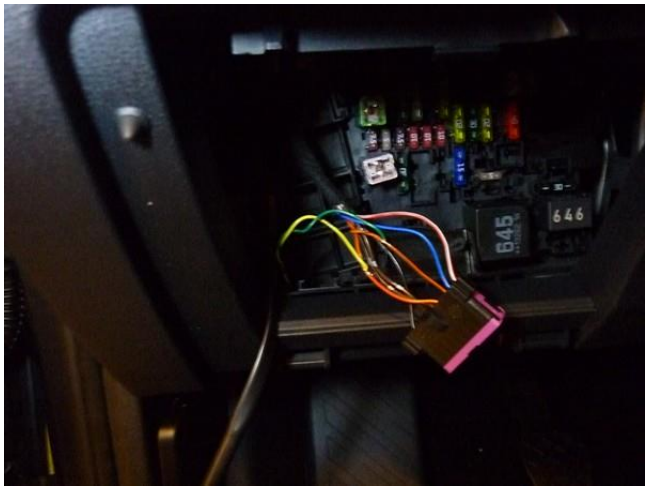
Wiring routing.

Wiring battery + in fuse box

Wiring

Mounting the fuel selection switch / EOBD : OCTAVIA

⚠ Mount the switch.

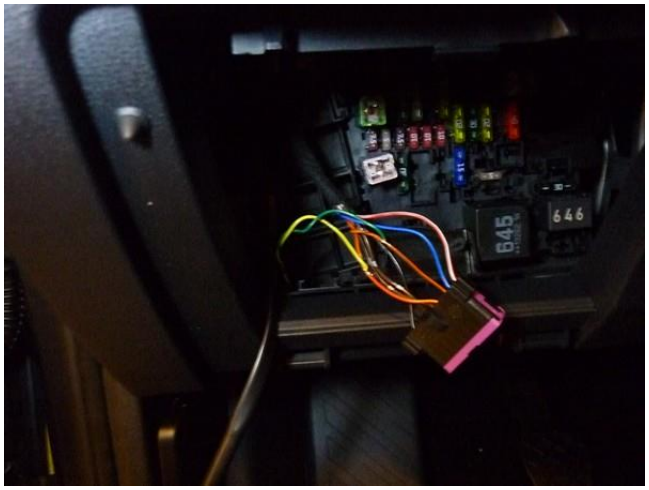



OBD connector.


Mount the fuel switch.

Mounting the fuel selection switch / EOBD : GOLF VII

⚠ Mount the switch.

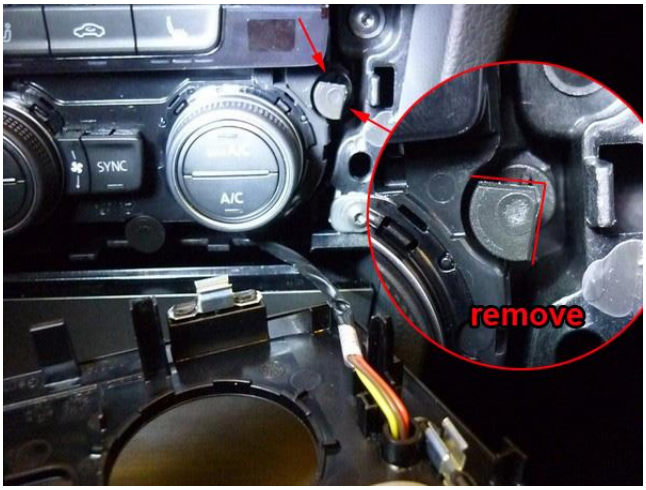


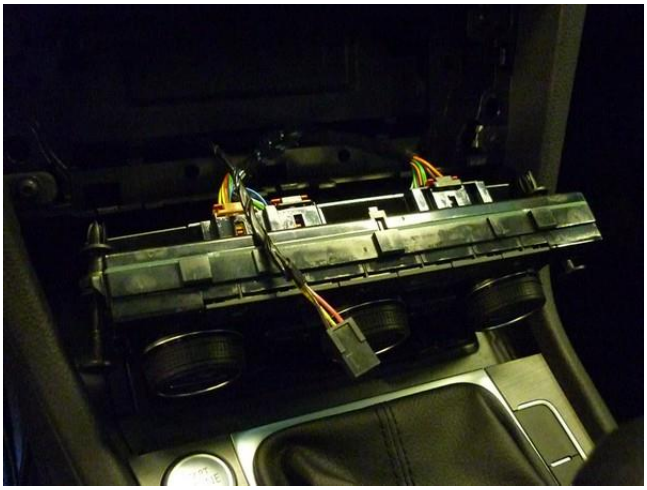
OBD connector.

Mounting the fuel switch.

Mounting the fuel selection switch / EOBD : GOLF VII

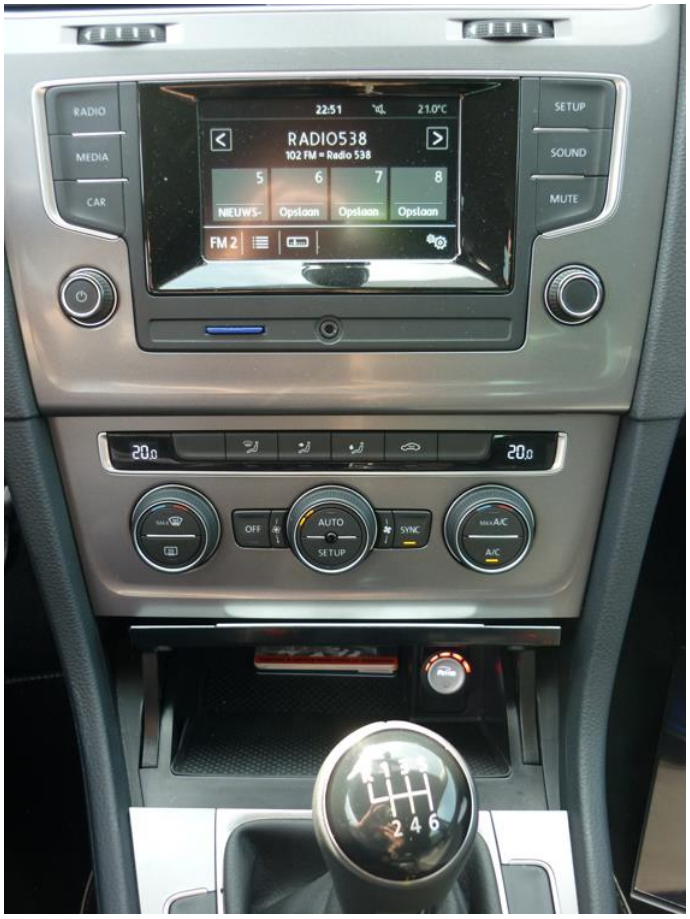
⚠ Mount the switch.





Option 2 Mounting the fuel selection switch / EOBD : GOLF VII

Mount the switch.

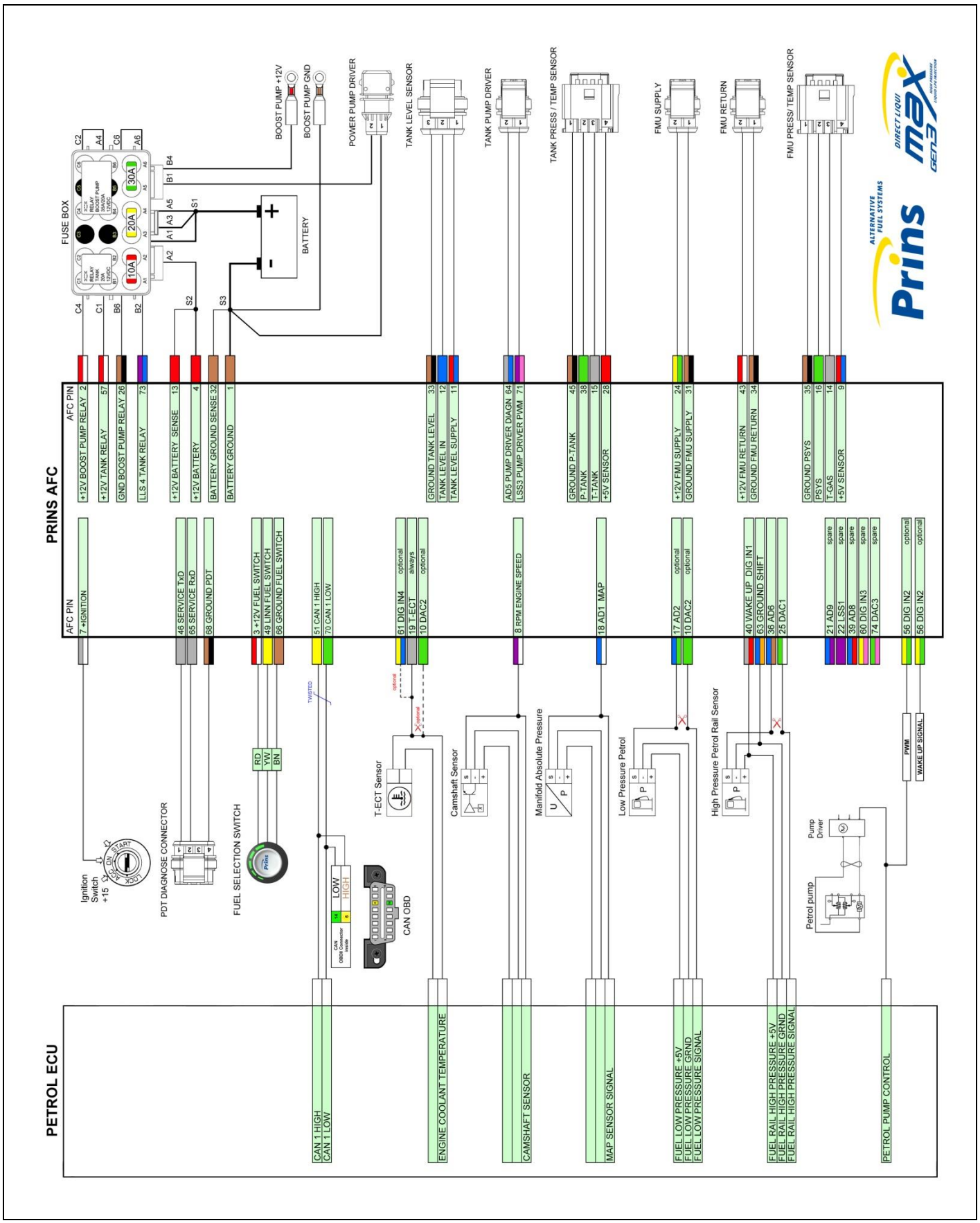


Mounting the fuel selection switch / EOBD : Seat Leon

Mount the switch.

OBD connector.

Basic DLM Gen3 wiring diagram

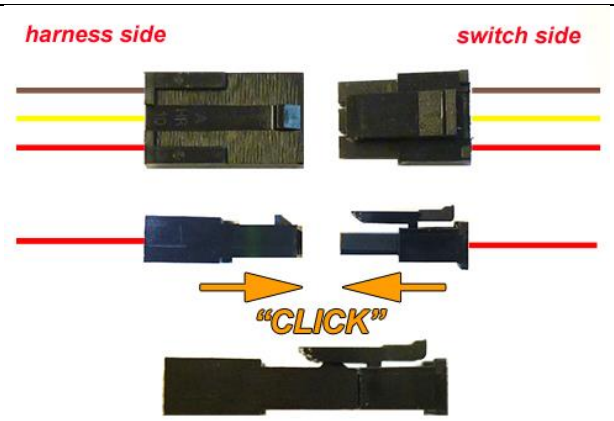


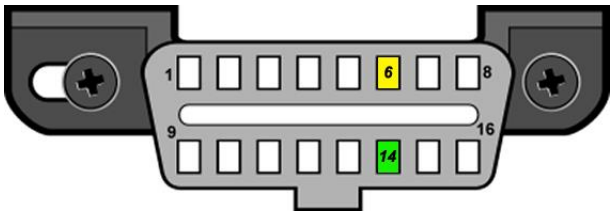
Main Connector

Electrical connections

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

Driver room

Wire number / code	**Wire colour**	**Connection**
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.
		

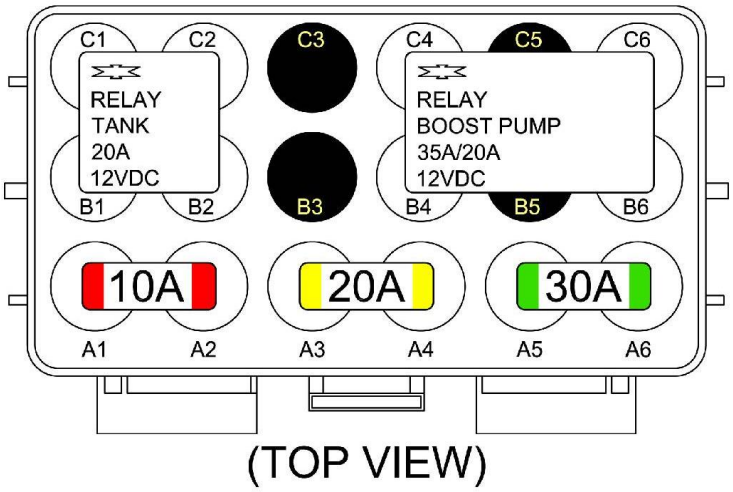
51 CAN-High		Yellow	EOBD connector pin 6
70 CAN-Low		Green	EOBD connector pin 14
			

Electrical connections

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

Wire text	*clr*	*Wire colour*	*Connection*
1			*Connect to the '–' of the battery (-31);* use a ring terminal. Wire location : **Original ground point behind battery**
1 BATTERY GROUND		Brown	

4			*Connect to the '+' of the battery (+30);* use a ring terminal. **Do not place the fuses** before having completed the installation of the lpg system. Wire location : Original fuse box
4 +12V BATTERY		Red	



(TOP VIEW)

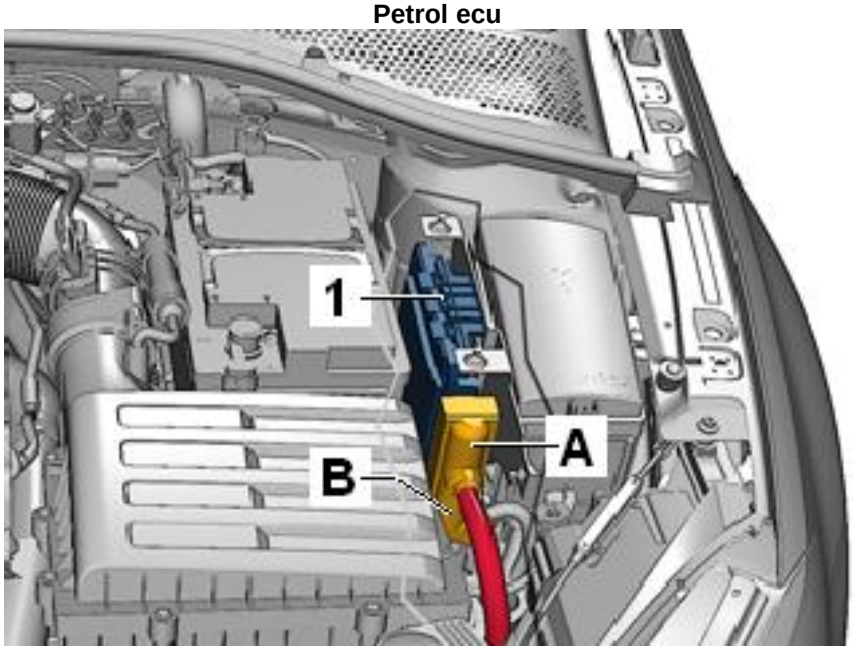
Electrical connections

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

Insulate not used wires.

Wire number / code	Wire colour	Connection
10 DAC 2	Green	insulate
17 AD 2	Blue-green	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
39 AD8	Blue-red	insulate
56 DI 2	Yellow-green	Insulate
60 DIG IN3	Yellow-pink	Insulate
61 DIG IN4	Yellow-blue	insulate
74 DAC 3	Green-pink	insulate
Insulate additional not used wires		

Petrol ecu



A=T60
B=T94

Electrical connections

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

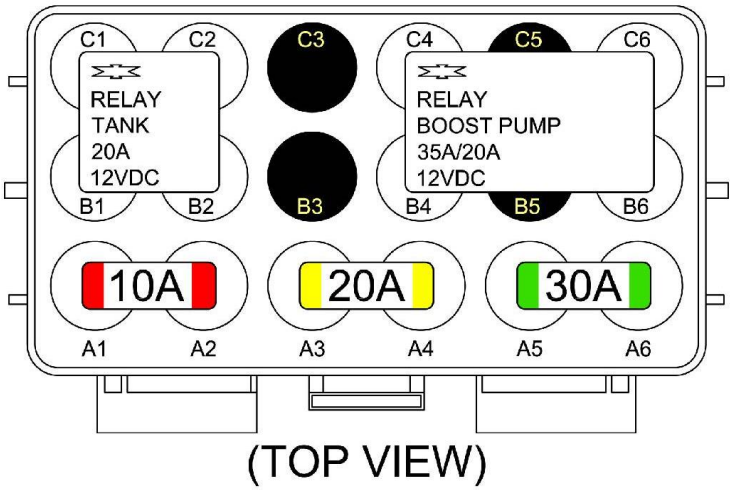
Wire text	*clr*	*Wire colour*	*Connection*
36 & 25			*High pressure petrol sensor signal interruption.* Wire colour : **Red-Yellow** Wire location : Petrol ECU, **T60/10**
36 AD 6		Blue-brown	Sensor side
25 DAC 1		Green-white	Petrol ecu side
63			*High pressure petrol sensor ground.* Wire colour : **Brown** Wire location : Petrol ECU, **T60/28**
63 Ground Shift		Blue-orange	
40			*High pressure petrol sensor 5Volt supply / car wake-up.* Wire colour : **Yellow-red** Wire location : Petrol ECU, **T60/3**
40 Wake-up		Grey-red	
18			*Analog in (sensor side) MAP sensor in.* Wire colour : **Black** Wire location : Petrol ECU, **T60/8**
18 AD 1		Blue-white	
8			*For measuring the engine speed signal.* Wire colour : **Brown-yellow** Wire location : Petrol ECU, **T60/21**
8 RPM		Purple-white	
19			*For measuring the engine coolant temperature.* Wire colour : **Green-black** Wire location : Petrol ECU, **T60/27**
19 T-ect		Grey	
7			*Connect to +ignition / contact+ (+15).* **Do not place the fuses in the holder before having completed the installation of the LPG system**. Wire colour : **Purple-black** Wire location : Petrol ECU, **T94/87**
7 +IGNITION		Grey-white	

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***
4-pole FMU P/T sensor 1. 35 Ground P-Sys 2. 16 P-Sys 3. 14 T-Sys 4. 9 +5V sensor	 Brown-black Green Grey Red-blue	Connect the 4-pole connector to the P/T sensor.
2-pole black connector FMU 24 +12V FMU supply 31 Ground FMU supply	 Yellow-green Brown-black	Connect the 2-pole connector to the black lock-off valve of the Fuel Management Unit
2-pole grey connector FMU 43 +12V FMU return 34 Ground FMU return	 Red-white Brown-black	Connect the 2-pole connector to the grey lock-off valve of the Fuel Management Unit
4-pole diagnose connector 46 Service TxD 65 Service RxD 68 Ground PDT	 Grey Grey Brown-black	*Diagnose connector for service / diagnosis.* Connector pin 1 Connector pin 2 Connector pin 4
Boost pump relay 2 +12V boost pump relay 26 Ground BP relay +12V fused BATT +12V Boost pump	 Red-white Brown-black Red Red	 Pin 86 of the boost pump relay C4 Pin 85 of the boost pump relay B6 Pin 30 of the boost pump relay C6-A5 Pin 87 of the boost pump relay B4
Wiring tank pump driver relay 57 +12V tank relay 73 LSS 4 tank relay +12V BATT fused +12V driver	 Red-white Purple-blue Red Red	 Pin 86 of the driver relay C1 Pin 85 of the driver relay B2 Pin 30 of the driver relay C2-A4 Pin 87 of the driver relay B1



(TOP VIEW)

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 1. 33 Ground tank level 2. 12 Tank level in 3. 11 + tank level supply	Brown-white Blue Red-blue	Connect the 3-pole connector to the tank level sensor.
4-pole Tank P/T sensor 1. 45 Ground P-Tank 2. 38 P-Tank 3. 15 T-Tank 4. 28 +5V sensor	Brown-black Green Grey Red	Connect the 4-pole connector to the P/T sensor.
2-pole Steering Diagnose connector 1. Ground pump driver 2. +12V pump driver	Brown Red	Connect the 2-pole connector to the driver, connector 3.
2-pole Steering Diagnose connector 1. 71 LSS3 Pump driver PWM 2. 64 Pump driver diagnose	Purple-pink Blue-grey	Connect the 2-pole connector to the driver, connector 4.

Pump Driver			
1. *2-pole connector tank lock-off*	Green-yellow Brown	From tank pump driver From tank pump driver	
2. *3-pole connector tank pump*	Red Brown	From tank pump driver From tank pump driver	
3. *2-pole connector driver*	Brown Red	From main ground From tank pump relay	Ground pump driver +12V pump driver
4. *2-pole connector driver*	Green Grey	From AFC pin 71 From AFC pin 64	LSS3 Pump driver PWM Pump driver diagnose

Prins safety stickers

Apply the sticker on an eye catching location.

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.