



FCA

FIAT CHRYSLER AUTOMOBILES

Installation manual **PART 2/2**

MANUFACTURER	FCA
TYPE	Based on Jeep Renegade
ENGINE DISPLACEMENT	999cc
NUMBER OF VALVES	12
ENGINE CODE / NUMBER - OUTPUT	55282151 - 88kW
FIRING ORDER	1-2-3
VEHICLE CATEGORIES	M
TRANSMISSION	MT
VERSION	AFC-2.1 DI-LPG
TYPE VSI INJECTOR	KN9 - 63cc
TYPE INJECTION MODULE	Gen2 - Type 2 - 6 Cylinder
PETROL ECU MANUFACTURER / CODE	Continental GPEC4LM
MODEL YEAR:	2018-
SYSTEM APPROVAL NUMBER (R115)	E*- #115R-0000** / VSI-LPG **
LOCATION R115 SYSTEM STICKER	right side, centre door post
ENGINE SET NUMBER	337/121001/A (Reducer) / 337/121002/A (eVP-500)
MANUAL NUMBER	076/3212500-2
DATE	2020-06-16

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Revision: 2

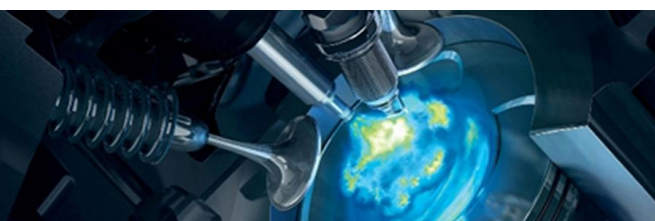


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FOR EXPLANATION AND CIRCUIT DIAGRAMS SEE : INSTALLATION MANUAL GENERAL PART 1 / 2



Manual updates / revision

Rev. nr	Rev. Date	Subject update
-	2019-11-15	Release
1	2019-11-27	Inverted high pressure signal interruption added wires 36 & 74
2	2020-06-16	Updated PWM wiring → from tank to petrol ECU



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.
- 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 and alarm system.
- Do not place the main fuse into the fuse holder before having completed the installation of the VSI system.
- The VSI computer has to be activated by means of the diagnosis software.
- In the unlikely event the AFC fails, it will automatically switch over to petrol. Never disconnect the AFC connector, unless you have removed the main fuse.
- When installing the VSI 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 the 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 100mm of the exhaust or similar heat source, unless such components are adequately shielded against heat.
- Remove any internal burrs after having shortened the LPG pipe.
(This guarantees the maximum flow through the pipe without pollution.)
- 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 an exterior filler into the body work).
- After having completed the installation, check the whole system for gas leakage; use a gas leak detection device. Also check for any 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'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.](#)

Please fill in the [warranty portal](#) completely 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 no. 099/99928)
- Exhaust gas analyser
- Multimeter
- Oscilloscope
- Prins diagnostic software
- Prins Diagnostic Tool
- Torque wrench (5-50Nm)
- Torque wrench (200-250Nm)
- Portable light
- Assortment drill bits Ø4 to 12 mm
- Assortment cutters (Ø20, 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 analyser)
- Check the condition of the ignition system (spark plugs, cables, coil)



Tightening moments

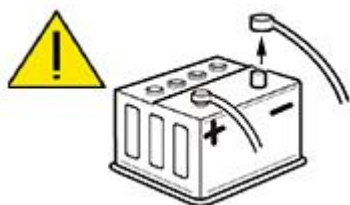
	Nm	Spanner mm
M5 x 0,8	6.5	8
M6 x 1,0	11.3	10
M8 x 1,25	27.3	13
M10 x 1	52	15-16-17
M10 x 1,5	54	15-16-17

LPG manifold nipple	1	3.5 Allen
Reducer nut - bracket	10	13
Lock-off nut	15	16
Fuel line nut – lock-off	20	13
Fuel line tank – lock-off	20	16
Filling hose connections	50	22

EXPLANATION OF SYMBOLS:

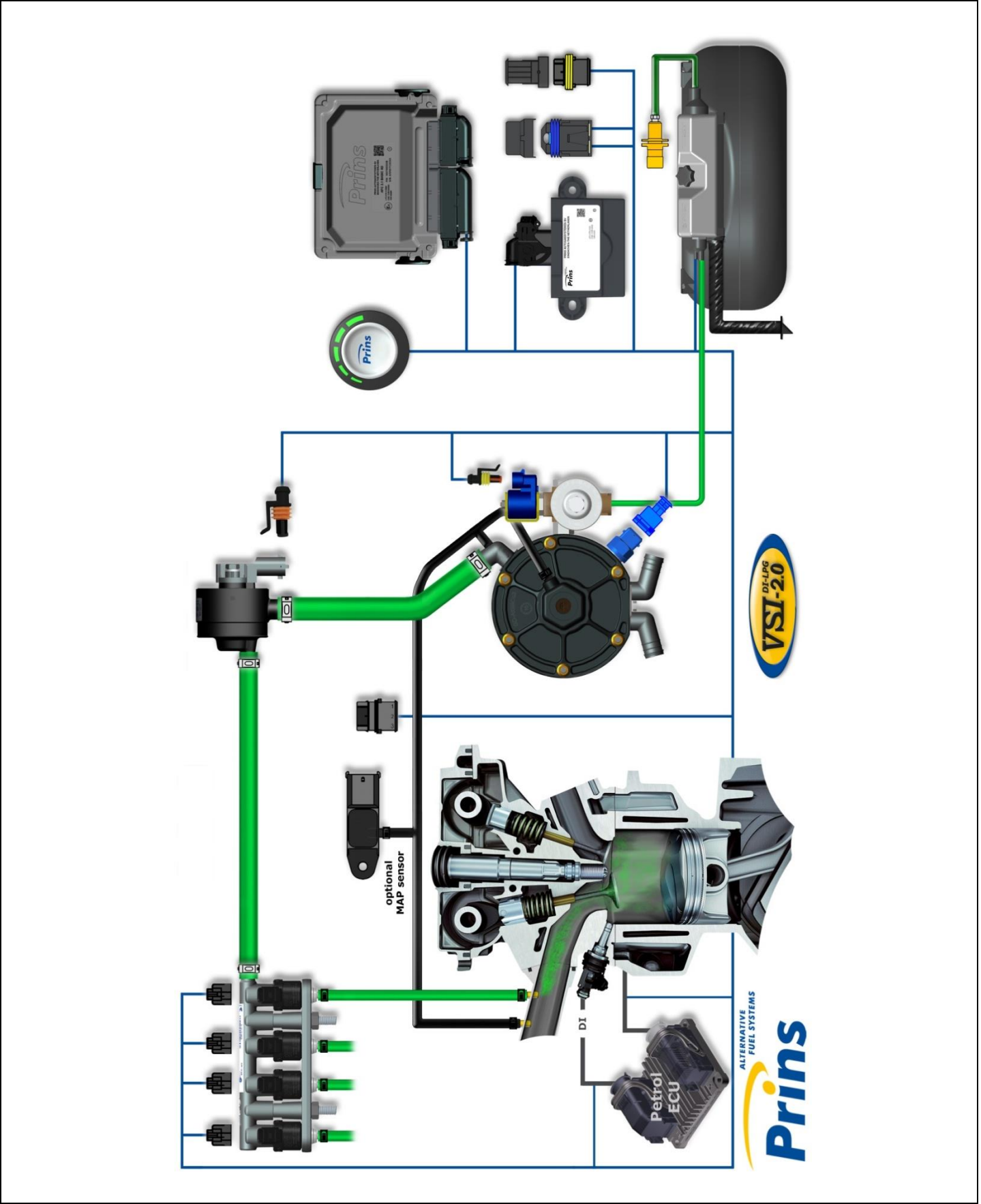


= IMPORTANT, CAUTION

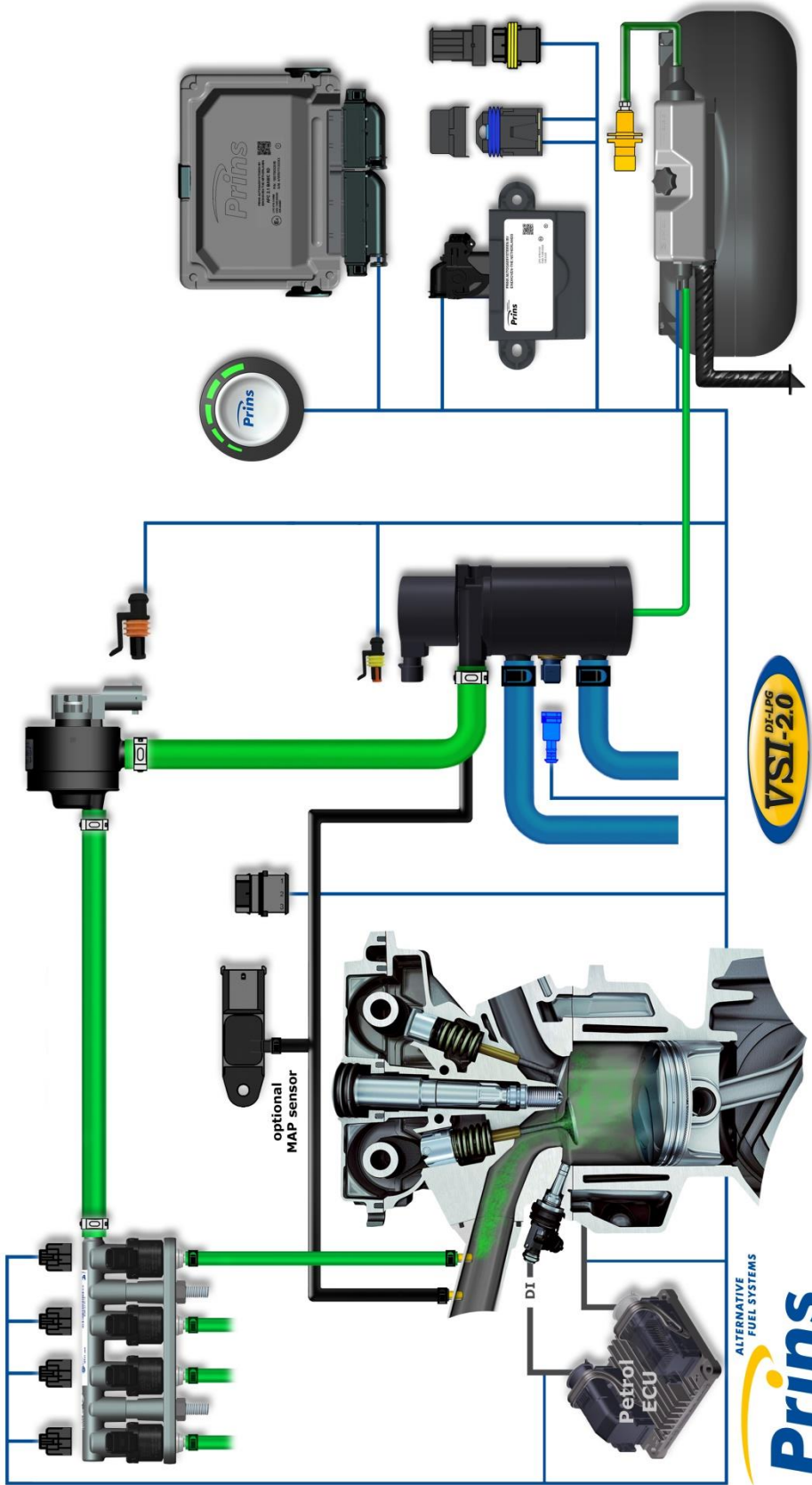


= WEAR SAFETY GOGGLES

Basic System Overview - Reducer



Basic System Overview - eVP-500



VSI approval numbers

	
Reducer VSI LPG Prins : E4-67R-010054 Reducer eVP-500 : E4-67R-010358 Lock-off valve OMB : E8-67R-014327 Lock-off valve Valtek : E4-67R-010041	Injector rail Prins : LPG E4-67R-010093 CNG E4-110R-000021
	
Filter unit T1 Prins : LPG E4-67R-010096 CNG E4-110R-000028 Filter unit Keihin: LPG E4-67R-010177 CNG E4-110R-000091	Injector Keihin KN8 : LPG E4-67R-010092 CNG E4-110R-000020 Injector Keihin KN9 : LPG E4-67R-010310 CNG E4-110R-000295
	
Prins AFC : E4-67R-010098 E4-10R-030507	Tubithor : LPG E13-67R-010145 CNG E13-110R-000017 Rubia : LPG E4-67R-010068 CNG E4-110R-000003 WinLas : LPG E37-67R-010140 CNG E37-110R-000012 Thunderflex : LPG E24-67R-010018 CNG E24-110R-000040

VSI component location overview
(based on Jeep Renegade 2018)

		Petrol ECU 
Filter 		AFC 
Reducer (or eVP-500) 		Injection module 
Rail(s) 		Fuse box 

	If applicable, R115 approval sticker : Right side centre door post
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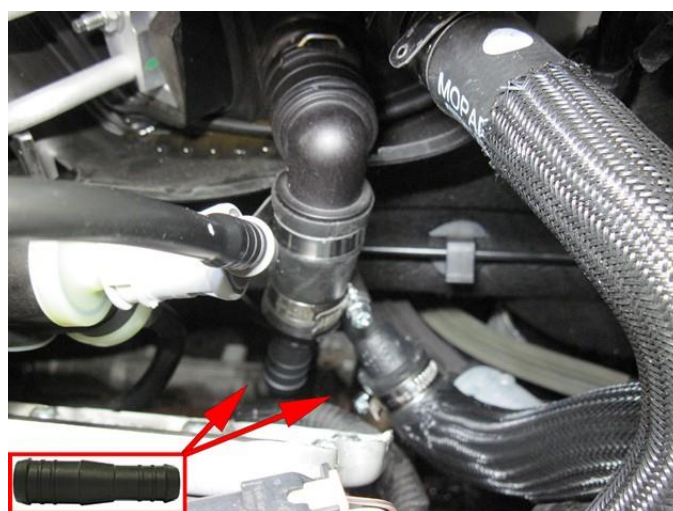
Mounting the Prins parts & water connections (based on Jeep Renegade 2018)



Mounting the Reducer with filter & eVP-500 with filter.

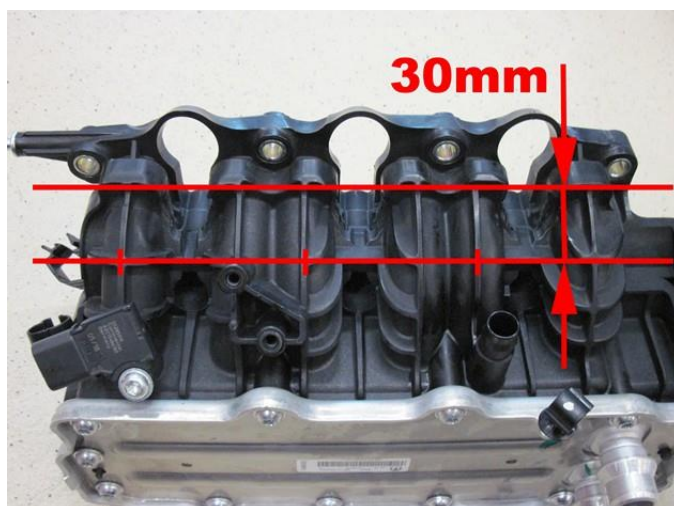


Mounting the AFC (bracket) and Injection Module.

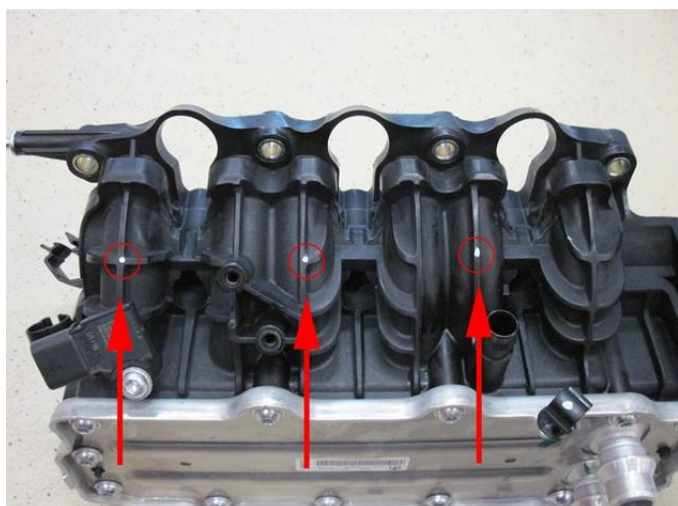


Water connections 2x 16x20mm

Inlet manifold Couplings



Remove the manifold and mark the holes for drilling.

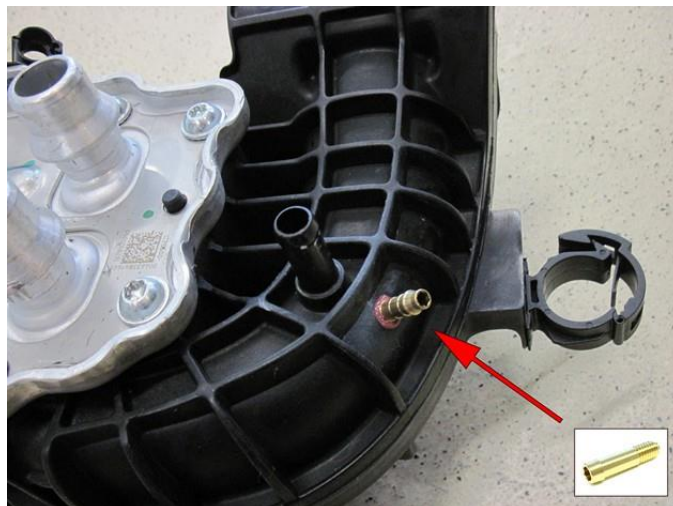


Mark the holes for drilling. Before grinding away the manifold, use a small drill to pre-drill the holes.

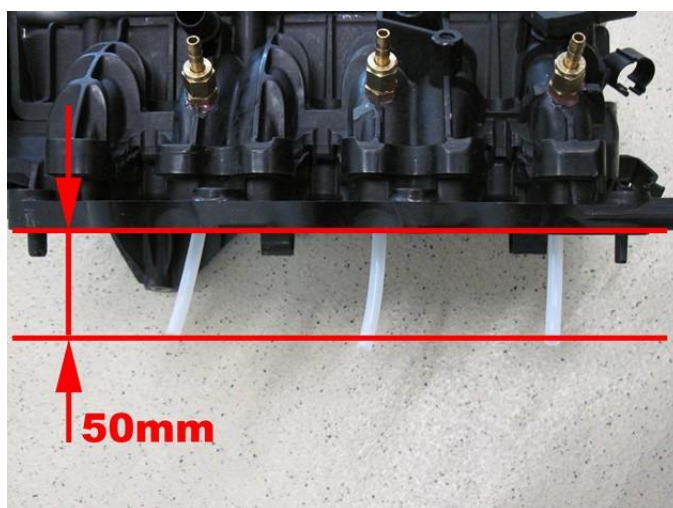
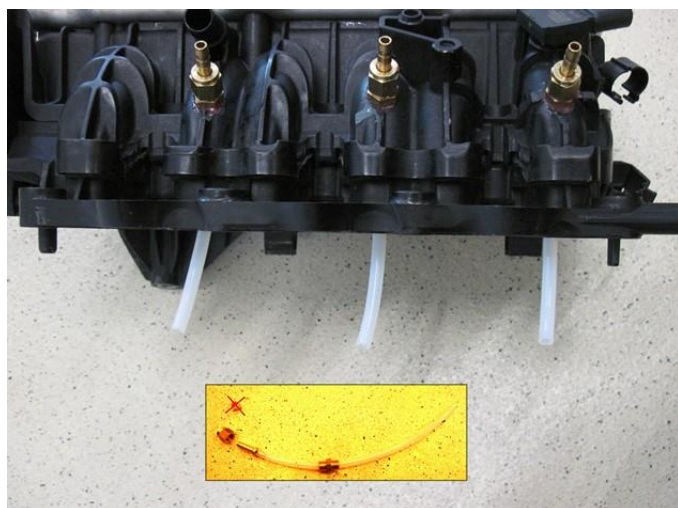


Drill the holes Ø8,5mm and cut thread M10x1. For the MAP/Overpressure, drill hole Ø5mm and cut thread M6.

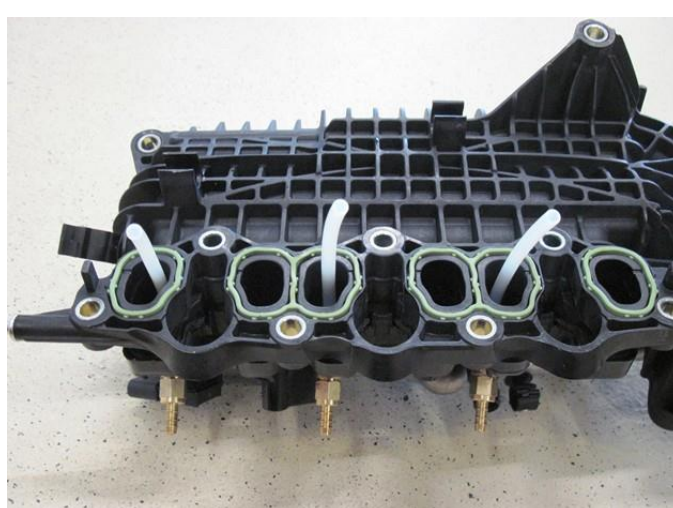
Inlet manifold Couplings



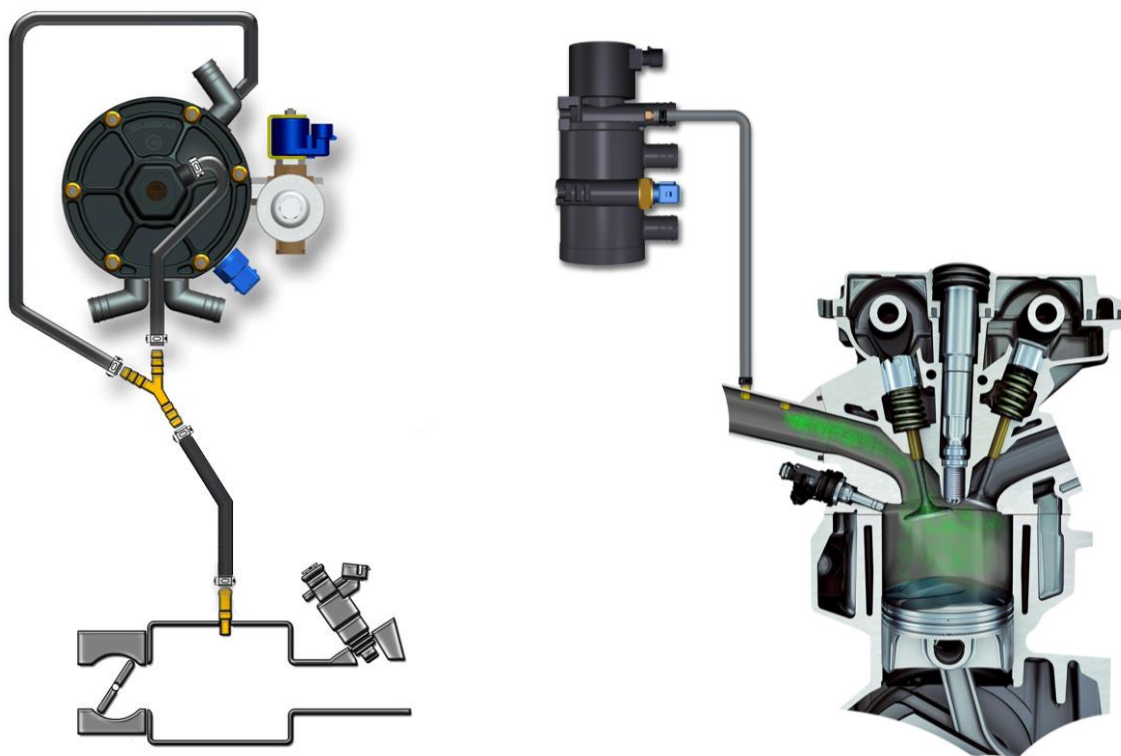
Mount the inlet & MAP couplings to the manifold with a locking compound.



Mount the hoses with the couplers to the inlet couplings.



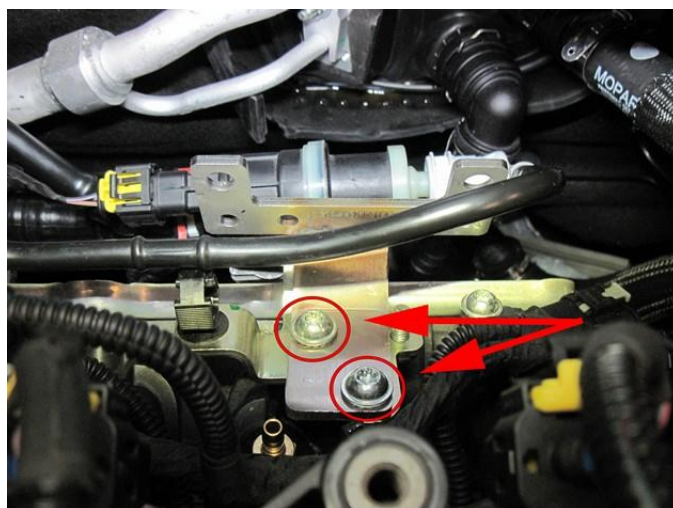
Overpressure / MAP connection



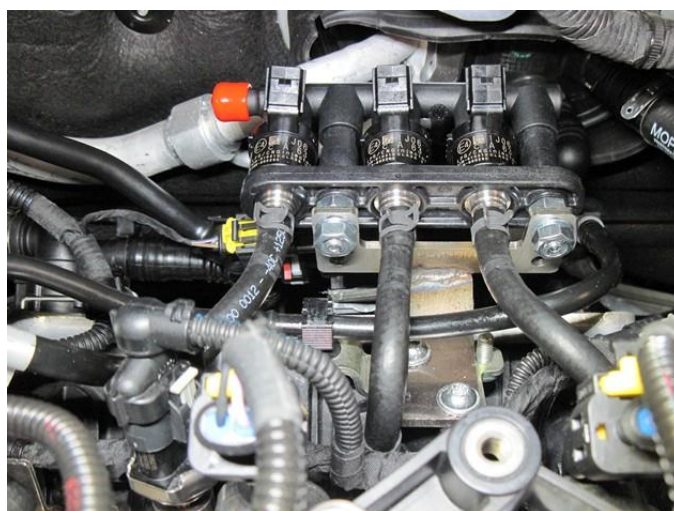
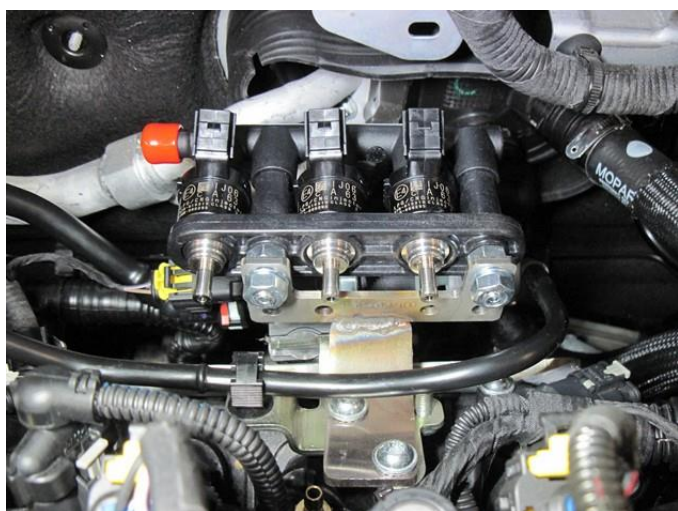
Drill Ø5mm, cut M6x1, install coupling with a locking compound.

Follow the water hoses for the routing of the 5mm MAP/overpressure hose to the Reducer / eVP-500.

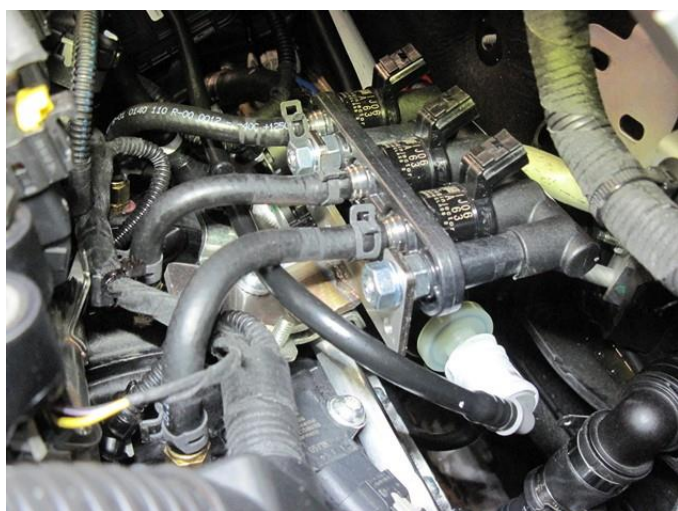
Mounting the VSI injector rail



Mount the bracket with the original bolts.



Mount the rail to the bracket and mount the 5mm LPG hoses to the manifold couplings.

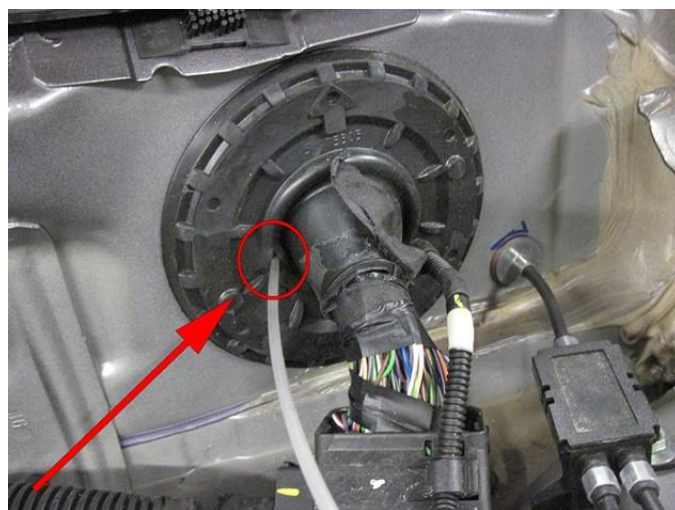


Wiring preparation / grommet

Inside → CAN & Switch

Connect to EOBD diagnose connector.			
51	CAN1 High		Yellow
70	CAN1 Low		Green

3-pole micro connector (switch).			
66	Ground fuel switch		Brown-black
3	+12V fuel switch		Red-white
49	LIN fuel switch		Yellow

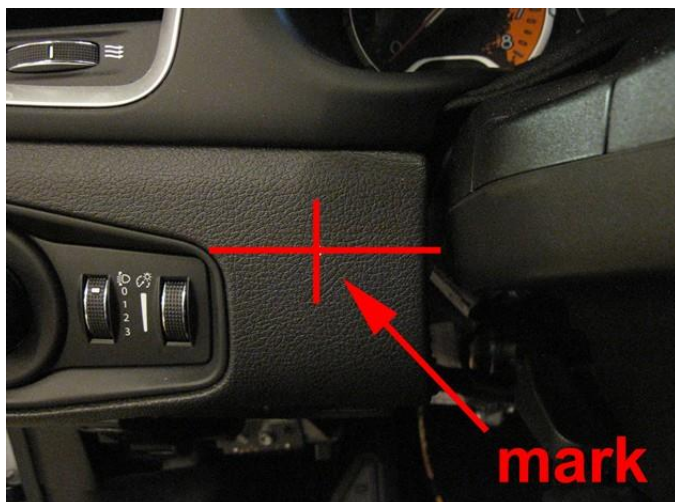


Jeep Renegade → The grommet is located under the wiper engine on the left side.

Mounting the fuel selection switch (Example Jeep Renegade)



When mounting the switch, only push on its sides.
Pushing the switch hard in the centre may result in damage to the switch.



Mark hole & drill Ø8,3mm.



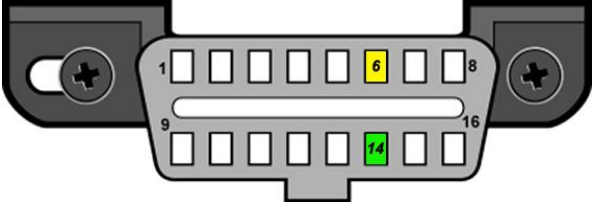
Mount the switch.



Electrical connections – Inside → CAN & Switch

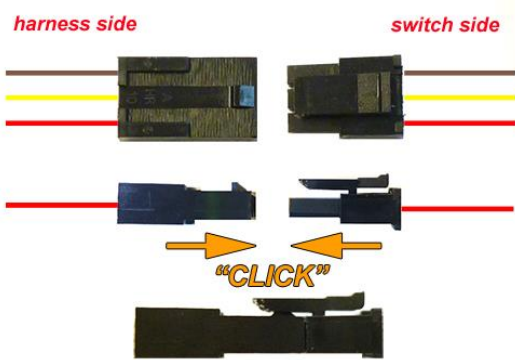
Driver room

				Connect to EOBD diagnose connector.
51	CAN1 High		Yellow	Pin : 6
70	CAN1 Low		Green	Pin : 14



**switch
OBD**

3-pole micro connector			Connect to the Prins fuel selection switch
66	Ground fuel switch		Brown-black
3	+12V fuel switch		Red-white
49	LIN fuel switch		Yellow



Prins VSI-2.0

PETROL ECU

Prins AFC

PETROL INJECTORS

INJECTION MODULE

CONNECTOR A

CONNECTOR B

CONNECTOR C

CONNECTOR D

CONNECTOR E

CONNECTOR F

CONNECTOR G

CONNECTOR H

CONNECTOR I

CONNECTOR J

CONNECTOR K

CONNECTOR L

CONNECTOR M

CONNECTOR N

CONNECTOR O

CONNECTOR P

CONNECTOR Q

CONNECTOR R

CONNECTOR S

CONNECTOR T

CONNECTOR U

CONNECTOR V

CONNECTOR W

CONNECTOR X

CONNECTOR Y

CONNECTOR Z

CONNECTOR AA

CONNECTOR AB

CONNECTOR AC

CONNECTOR AD

CONNECTOR AE

CONNECTOR AF

CONNECTOR AG

CONNECTOR AH

CONNECTOR AI

CONNECTOR AJ

CONNECTOR AK

CONNECTOR AL

CONNECTOR AM

CONNECTOR AN

CONNECTOR AO

CONNECTOR AP

CONNECTOR AQ

CONNECTOR AR

CONNECTOR AS

CONNECTOR AT

CONNECTOR AU

CONNECTOR AV

CONNECTOR AW

CONNECTOR AX

CONNECTOR AY

CONNECTOR AZ

CONNECTOR BA

CONNECTOR BB

CONNECTOR BC

CONNECTOR BD

CONNECTOR BE

CONNECTOR BF

CONNECTOR BG

CONNECTOR BH

CONNECTOR BI

CONNECTOR BJ

CONNECTOR BK

CONNECTOR BL

CONNECTOR BM

CONNECTOR BN

CONNECTOR BO

CONNECTOR BP

CONNECTOR BQ

CONNECTOR BR

CONNECTOR BS

CONNECTOR BT

CONNECTOR BU

CONNECTOR BV

CONNECTOR BW

CONNECTOR BX

CONNECTOR BY

CONNECTOR BZ

CONNECTOR CA

CONNECTOR CB

CONNECTOR CC

CONNECTOR CD

CONNECTOR CE

CONNECTOR CF

CONNECTOR CG

CONNECTOR CH

CONNECTOR CI

CONNECTOR CJ

CONNECTOR CK

CONNECTOR CL

CONNECTOR CM

CONNECTOR CN

CONNECTOR CO

CONNECTOR CP

CONNECTOR CQ

CONNECTOR CR

CONNECTOR CS

CONNECTOR CT

CONNECTOR CU

CONNECTOR CV

CONNECTOR CW

CONNECTOR CX

CONNECTOR CY

CONNECTOR CZ

CONNECTOR DA

CONNECTOR DB

CONNECTOR DC

CONNECTOR DD

CONNECTOR DE

CONNECTOR DF

CONNECTOR DG

CONNECTOR DH

CONNECTOR DI

CONNECTOR DJ

CONNECTOR DK

CONNECTOR DL

CONNECTOR DM

CONNECTOR DN

CONNECTOR DO

CONNECTOR DP

CONNECTOR DQ

CONNECTOR DR

CONNECTOR DS

CONNECTOR DT

CONNECTOR DU

CONNECTOR DV

CONNECTOR DW

CONNECTOR DX

CONNECTOR DY

CONNECTOR DZ

CONNECTOR EA

CONNECTOR EB

CONNECTOR EC

CONNECTOR ED

CONNECTOR EE

CONNECTOR EF

CONNECTOR EG

CONNECTOR EH

CONNECTOR EI

CONNECTOR EJ

CONNECTOR EK

CONNECTOR EL

CONNECTOR EM

CONNECTOR EN

CONNECTOR EO

CONNECTOR EP

CONNECTOR EQ

CONNECTOR ER

CONNECTOR ES

CONNECTOR ET

CONNECTOR EU

CONNECTOR EV

CONNECTOR EW

CONNECTOR EX

CONNECTOR EY

CONNECTOR EZ

CONNECTOR FA

CONNECTOR FB

CONNECTOR FC

CONNECTOR FD

CONNECTOR FE

CONNECTOR FF

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CONNECTOR FO

CONNECTOR FP

CONNECTOR FQ

CONNECTOR FR

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CONNECTOR FX

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CONNECTOR FZ

CONNECTOR GA

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CONNECTOR HV

CONNECTOR HW

CONNECTOR HX

CONNECTOR HY

CONNECTOR HZ

CONNECTOR IA

CONNECTOR IB

CONNECTOR IC

CONNECTOR ID

CONNECTOR IE

CONNECTOR IF

CONNECTOR IG

CONNECTOR IH

CONNECTOR II

CONNECTOR IJ

CONNECTOR IK

CONNECTOR IL

CONNECTOR IM

CONNECTOR IN

CONNECTOR IO

CONNECTOR IP

CONNECTOR IQ

CONNECTOR IR

CONNECTOR IS

CONNECTOR IT

CONNECTOR IU

CONNECTOR IV

CONNECTOR IW

CONNECTOR IX

CONNECTOR IY

CONNECTOR IZ

CONNECTOR JA

CONNECTOR JB

CONNECTOR JC

CONNECTOR JD

CONNECTOR JE

CONNECTOR JF

CONNECTOR JG

CONNECTOR JH

CONNECTOR JI

CONNECTOR JJ

CONNECTOR JK

CONNECTOR JL

CONNECTOR JM

CONNECTOR JN

CONNECTOR JO

CONNECTOR JP

CONNECTOR JQ

CONNECTOR JR

CONNECTOR JS

CONNECTOR JT

CONNECTOR JU

CONNECTOR JV

CONNECTOR JW

CONNECTOR JX

CONNECTOR JY

CONNECTOR JZ

CONNECTOR KA

CONNECTOR KB

CONNECTOR KC

CONNECTOR KD

CONNECTOR KE

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CONNECTOR KI

CONNECTOR KJ

CONNECTOR KK

CONNECTOR KL

CONNECTOR KM

CONNECTOR KN

CONNECTOR KO

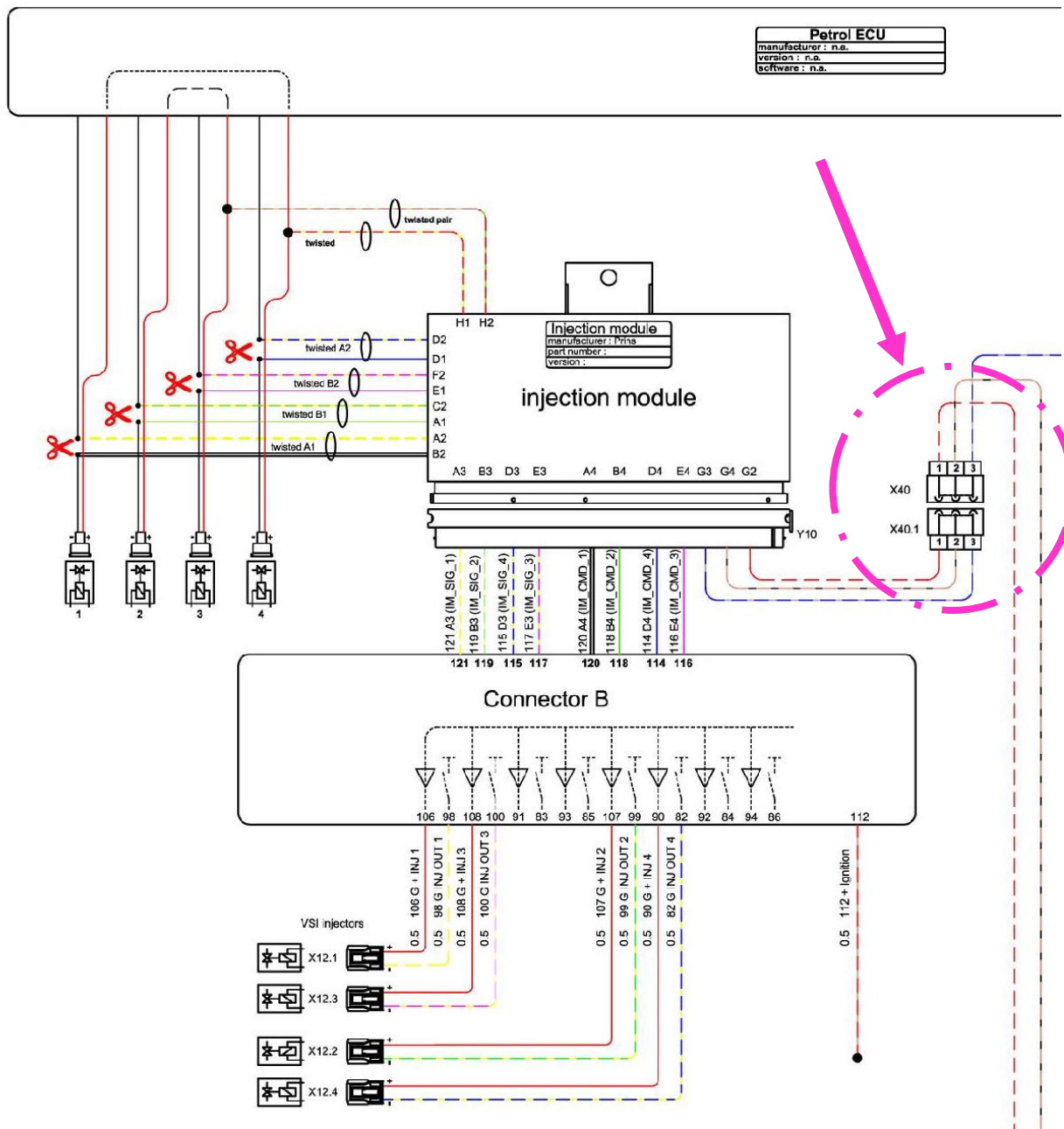
CONNECTOR KP

CONNECTOR KQ

Electrical connections

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

Connector Injection Module



Overview Petrol ECM (Example Jeep Renegade)



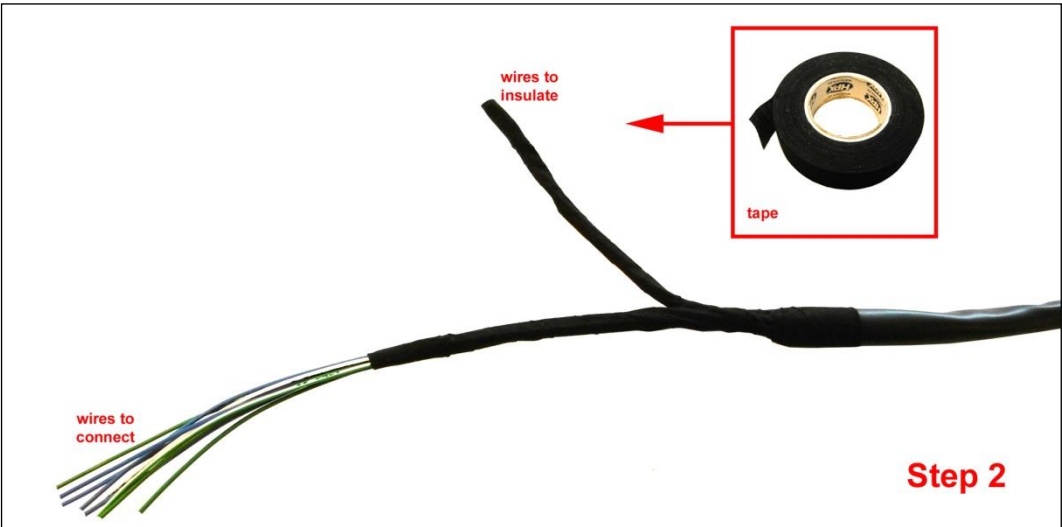
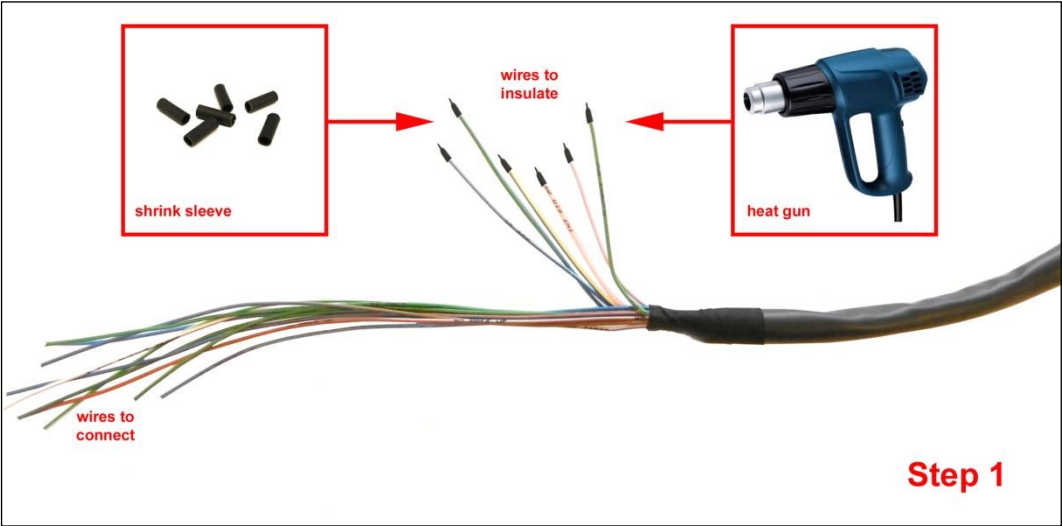
C2 = Engine connector (103 pin)

C1 = Body connector (95 pin)

Electrical connections – Not used wires to insulate

19	AD4		Blue	<i>Insulate</i>
20	AD3		Blue-pink	<i>Insulate</i>
22	LSS1		Purple	<i>Insulate</i>
23	LSS2		Purple-green	<i>Insulate</i>
39	AD8		Blue-red	<i>Insulate</i>
43	+12 Valve 2		Red-white	<i>Insulate</i>
50	DAC4		Green-blue	<i>Insulate</i>
60	DIG IN3		Yellow-pink	<i>Insulate</i>
61	DIG IN4		Yellow-blue	<i>Insulate</i>
62	C Ground		Brown-black	<i>Insulate</i>
<i>Insulate additional loose wires</i>				

Electrical connections – How to insulate not used wires



Electrical connections

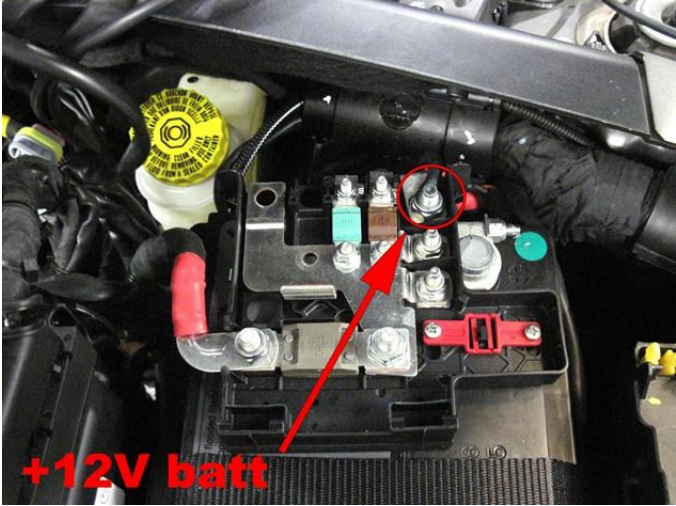
Check and measure the wiring in case of changes in the cars wiring colours.

Do not place the fuse in the holder before having completed the installation of the LPG system.

32	Ground sense		Brown	Connect to the '-' of the battery; use a ring terminal.
1	Ground battery			



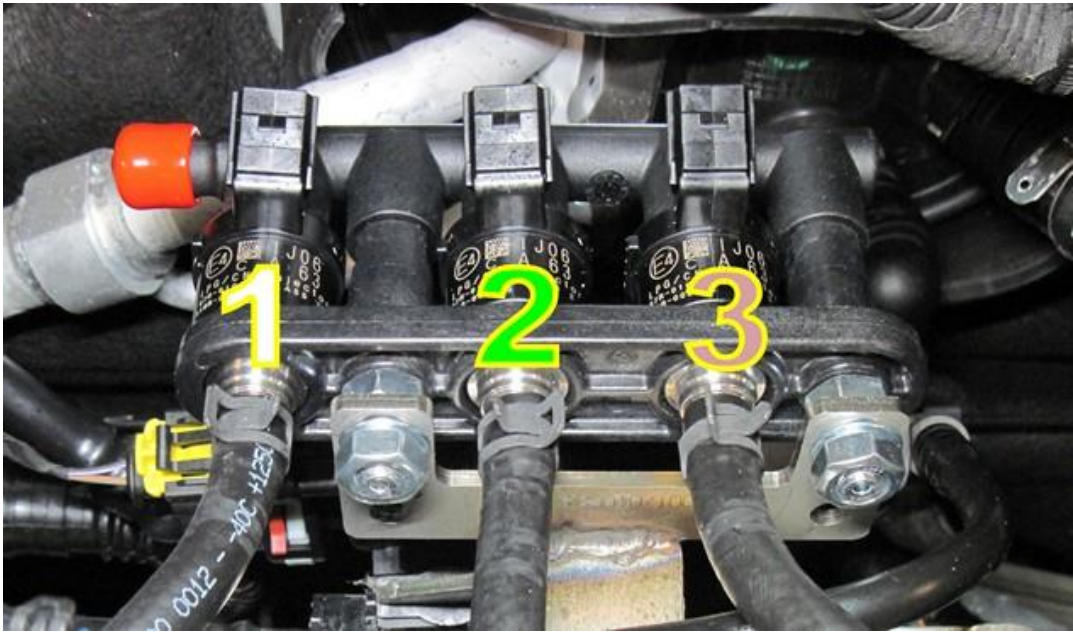
4	+12V Battery		Red	Connect to the '+' of the battery; use a ring terminal
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Electrical connections

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

98	98 G INJ OUT 1		White-yellow	Connector VSI-injector to cylinder 1. Timing belt/chain side
106	106 G + INJ 1		red	
99	99 G INJ OUT 2		Green-yellow	Connector VSI-injector to cylinder 2.
107	107 G + INJ 2		red	
100	100 G INJ OUT 3		Pink-yellow	Connector VSI-injector to cylinder 3.
108	108 G + INJ 3		red	



Electrical connections

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



For measuring the petrol injectors :
Interrupt each petrol injector control wire (injector min)
See diagrams: Installation manual general part 1 / 2.

Attention:

**Each bicoloured measuring wire corresponds to a specific LPG injector and petrol injector / cylinder number.
Do not interchange the wires.**

Petrol injector cyl. 1			
INJ LO 1		White	Injector side
ECU LO 1		White-yellow	ECU side
IM pos. B2 / A2			Colour : Green-yellow Location : petrol ecu connector C2 pin 89

ECU HIGH 1		Red-white	Injector side
IM pos. H1			Colour : Dark-blue / Red Location : petrol ecu connector C2 pin 94

Petrol injector cyl. 2			
INJ LO 2		Green	Injector side
ECU LO 2		Green-yellow	ECU side
IM pos. A1 / C2			Colour : Grey-black Location : petrol ecu connector C2 pin 67

ECU HIGH 2		Red-green	Injector side
IM pos. H2			Colour : Grey-red Location : petrol ecu connector C2 pin 92

Petrol injector cyl. 3			
INJ LO 3		Pink	Injector side
ECU LO 3		Pink-yellow	ECU side
IM pos. E1 / F2			Colour : Black-violet Location : petrol ecu connector C2 pin 69

ECU HIGH 3		Red-pink	Injector side
IM pos. H3			Colour : Black-white Location : petrol ecu connector C2 pin 90

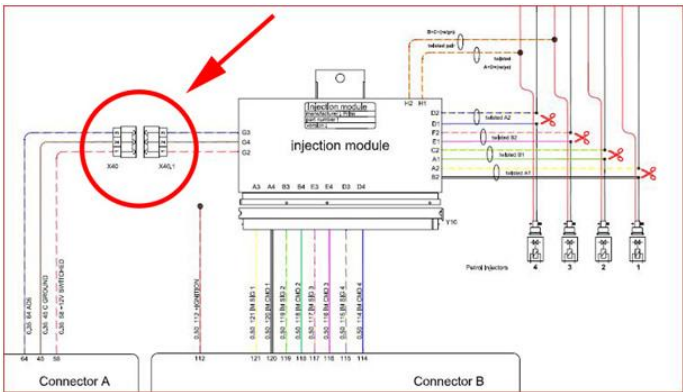
Electrical connections

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

3-pole connector			For measuring the inlet manifold pressure (MAP). Cut-off connector
27	+5V Sensor		Red-blue <i>insulate</i>
37	C ground		Brown-black <i>insulate</i>
18	AD1		Blue-white Wire colour : White-red Wire location : petrol ecu connector C2 pin 24
			For measuring the engine speed signal. Wire colour : Grey-white Wire location : petrol ecu connector C2 pin 34
8	RPM		Purple-white
17 & 25			High pressure petrol sensor signal interruption. Wire colour : Red-green Wire location : petrol ecu connector C2 pin 22
17	AD 2		Blue-green Sensor side
25	DAC 1		Green-white Petrol ecu side
36 & 74			High pressure petrol sensor signal interruption. inverted Wire colour : Brown-green Wire location : petrol ecu connector C2 pin 59
36	AD6		Blue-brown Sensor side
74	DAC3		Green-pink Petrol ecu side
			High pressure petrol sensor supply 5V. Wire colour : White-dark blue Wire location : petrol ecu connector C2 pin 32
40	Wake-up		Grey-red
			High pressure petrol sensor ground. Wire colour : Brown-yellow Wire location : petrol ecu connector C2 pin 38
63	Ground Shift		Blue-orange
38 & 10			Low pressure petrol sensor signal interruption. Wire colour : Orange-white Wire location : petrol ecu connector C1 pin 40
38	AD 7		Blue-light blue Sensor side
10	DAC 2		Green Pump Driver side
112			Connect to +ignition / contact+ (+15). Do not place the fuses in the holder before having completed the installation of the LPG system. Wire colour : Dark blue-red Wire location : petrol ecu connector C1 pin 90
112	+Ignition		Red-grey
			PWM Wire colour: Grey-Dark-blue Wire location: petrol ecu connector C1 pin 72
56	DI2		Yellow-green

Electrical connections

Connectors in wiring loom

2-pole blue connector 15 T-ECT 34 Ground T-ECT	Grey Brown-black	<i>For measuring the engine coolant temperature (Tect).</i> Connect the connector to the reducer temperature sensor.
4-pole connector 35 Ground Psys 14 T-Gas 9 +5 Volt sensor 16 Psys	Brown-black Grey Red-blue Green	<i>For measuring gas pressure and temperature.</i> Connect the connector to the filter unit sensor.
2-pole connector 24 +12V reducer lock-off 31 C Ground	Yellow-green Brown-black	Connect the connector to the reducer lock-off valve.
4-pole connector 46 Service TxD 65 Service RxD 68 Ground PDT	Grey Grey Brown-black	Diagnose connector.
Tank wiring loom 2 +12V Tank relay 12 Tank level IN 26 Ground tank relay	red blue black	Connect to the tank lock-off. Connect the tank level gauge. Connect to the tank lock-off.
Wiring loom link 45 C ground 58 +12V switched 64 AD5	Brown-black Red-white Blue-grey	Connection from AFC connector A to connector B. 

Optional:

3-pole connector 11 + manometer 12 tank level in 33 ground manometer	red blue brown	Cut off connector and insulate wires
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Checklist after installation

1. Connect the Prins Diagnostic Tool and run the VSI diagnostic program.
Install the VSI fuse, turn the ignition key in the accessory position.
When working on the car, beware of moving and rotating parts in the engine compartment.
2. When commissioning the LPG system, you must activate the AFC with the diagnostic software.
When the AFC has not been activated, the switch will keep blinking.
To activate the AFC, select function *activate ECM* in the diagnostic software.
3. Check whether the program in the AFC matches with the car (dedicated engine set):
Refer the car description in the diagnostic software (Basic → Identification) and compare these with the set number.
4. The system will switch over to LPG as soon as the temperature of the coolant becomes higher than parameter 70 - Switch over ECT.
5. Check all components and connections for any gas leakage (use a LPG leak detector device or a fluid detection like soap). Caution for moving and rotating parts in the engine compartment!
6. Let the engine run warm on petrol >80°C.
Check if the reducer heats up.
Check the engine signals, petrol injection time, RPM, ECT, lambda, MAP signal and petrol pressure signal.
Let the engine run idle on LPG.
Adjust the reducer pressure.
Refer to *Basic → System* in the diagnostic software for the idle level value set.
Adjust the reducer pressure in such a way that the pressure measured (P-sys) equals the idle level value.
Turn the socket-head screw at the front of the reducer to adjust the pressure.
An error code will be generated whenever the pressure variation is too high.
7. Use the diagnostic software to check again all input and output signals.
8. Check the system for error codes and solve these, if required.
Check the petrol ECM for EOBD error codes.
Place the protection connector on the VSI communication connector.
9. Take a test drive and check the drivability on LPG and petrol.

