



Mercedes-Benz

Installation manual ***PART 2/2***

MANUFACTURER
TYPE
ENGINE DISPLACEMENT
NUMBER OF VALVES
ENGINE CODE / NUMBER - OUTPUT
FIRING ORDER
VEHICLE CATEGORIES
TRANSMISSION
VERSION
TYPE VSI INJECTOR
TYPE INJECTION MODULE
PETROL ECU MANUFACTURER / CODE
MODEL YEAR:
SYSTEM APPROVAL NUMBER (R115)
LOCATION R115 SYSTEM STICKER
ENGINE SET NUMBER
MANUAL NUMBER
DATE

Mercedes-Benz
Based on W204 (C-Class)
1595cc
16V
M274.910 (Generation 1) – 115kW
1-3-4-2
M
AT
AFC-2.1 DI-LPG
KN9 - 63cc
Piëzo IM Module
Bosch MED17.7.2
2008-2014
n.a.
right side, centre door post
354/129003/A
076/1403800-2
2020-1-27

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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
-	2019-07-02	Release
1	2019-10-23	Technical wiring loom changes – Beware of the Piëzo module update!
2	27-1-2020	HPPRS 17AD2 -> 36AD6



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 VSI computer fails, it will automatically switch over to petrol. Never disconnect the VSI computer 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)



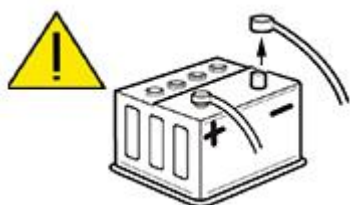
Tightening moments

	Nm	Spanner mm
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

EXPLANATION OF SYMBOLS:

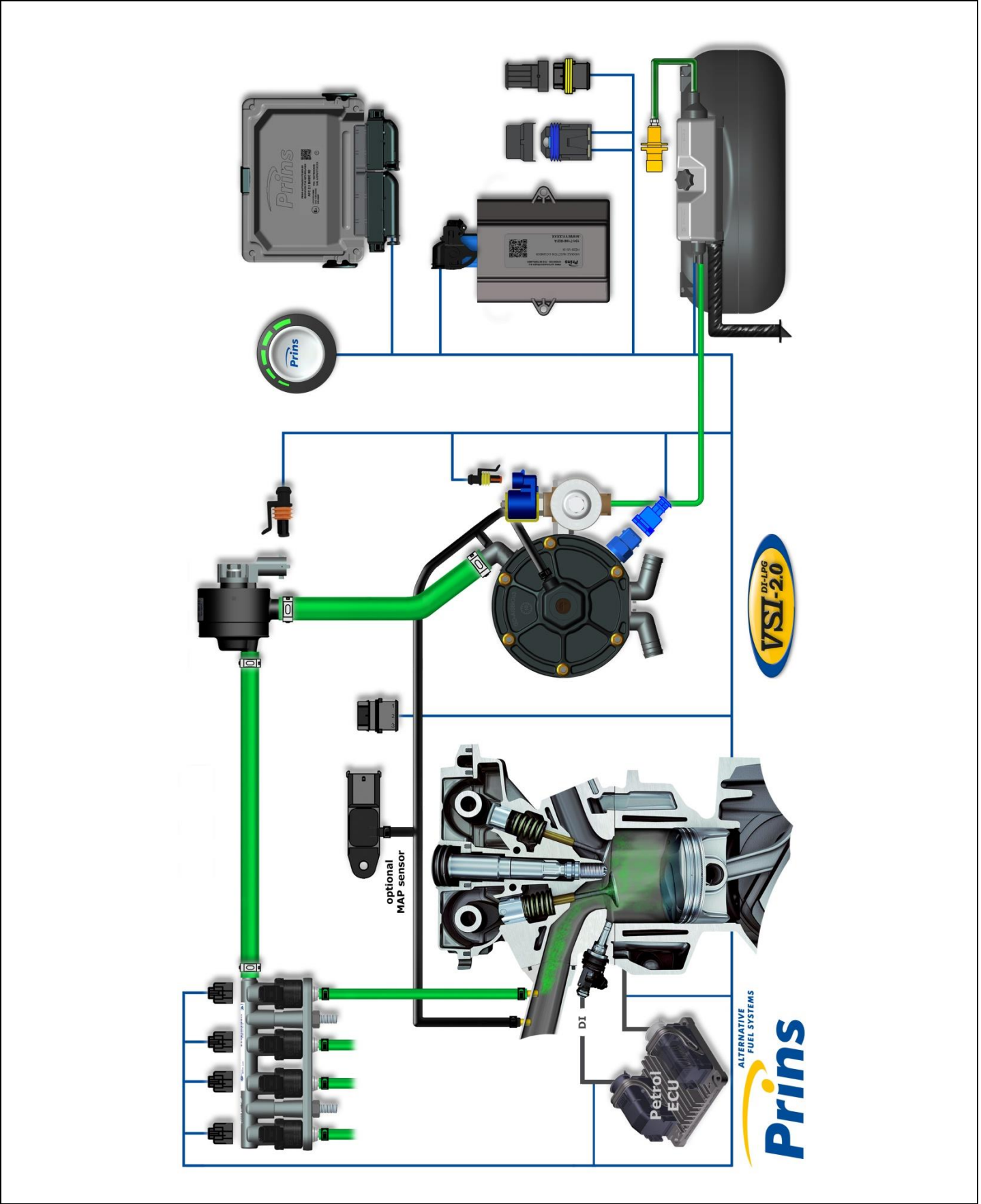


= IMPORTANT, CAUTION



= WEAR SAFETY GOGGLES

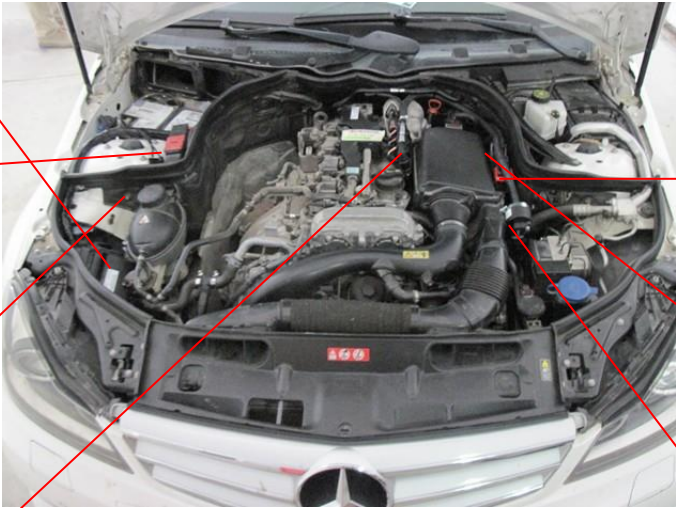
Base diagram



VSI approval numbers

	
Reducer VSI LPG : E4-67R-010054 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 / T2 Prins : LPG E4-67R-010096 CNG E4-110R-000028	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

VSI component location overview
(example W204 C-class)

AFC 		
IM Module 		Petrol ECU 
Fuse 		Reducer 
Rail(s) 		Filter 

	R115 approval sticker : Right side centre door post
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Mounting the inlet manifold couplings

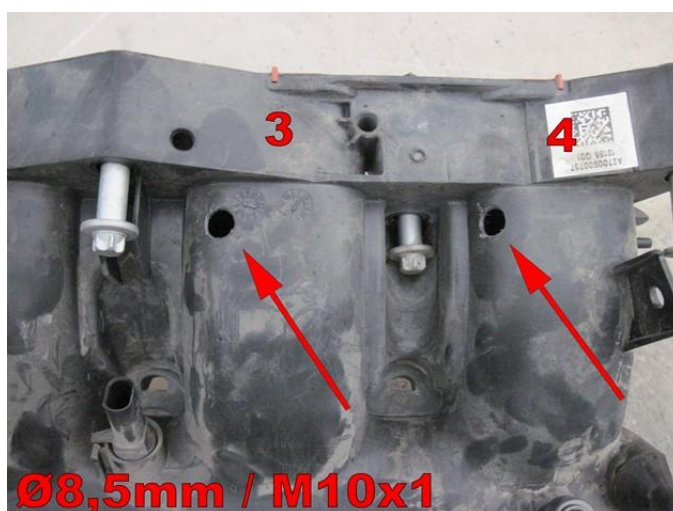
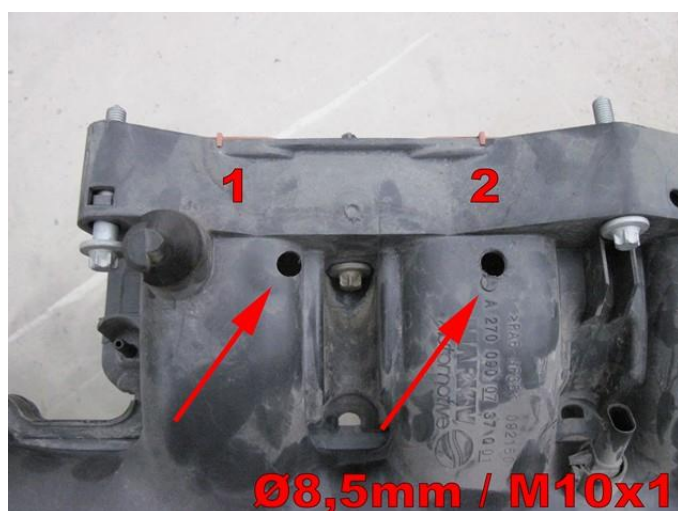
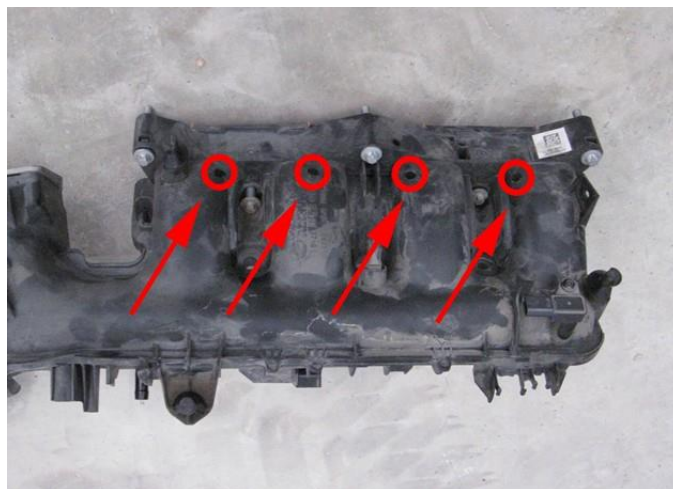
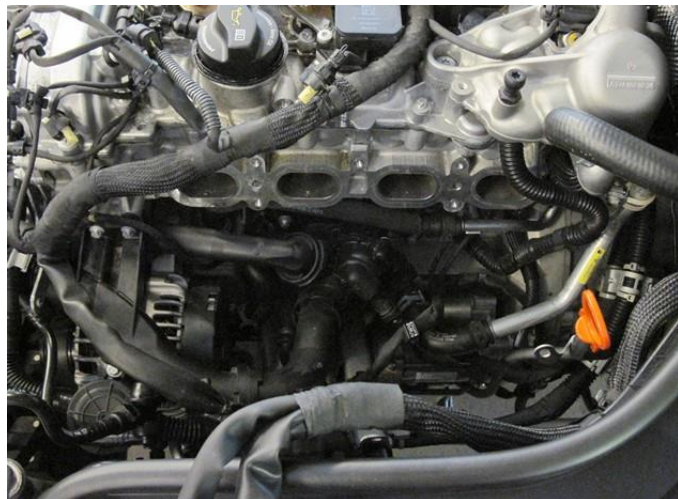
Remove the inlet manifold.

Drill 4 holes of **8,5mm** in the inlet manifold. Cut **M10x1** thread in these holes.

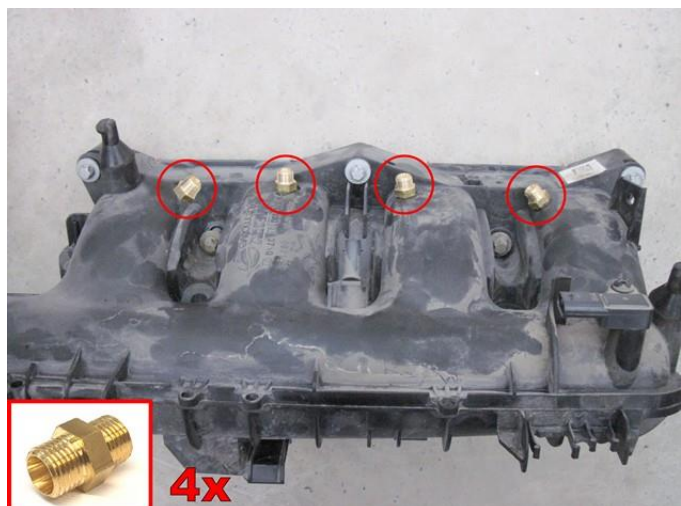
Place the VSI couplings with a locking compound in the inlet manifold.

Watch out that the lock compound doesn't come inside the VSI couplings.

Place the inlet manifold back on the engine.



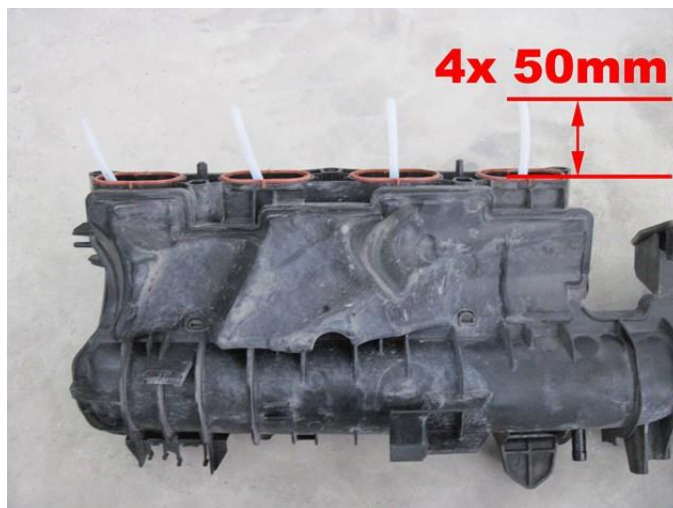
Mounting the inlet manifold couplings



Mount the couplings with a locking compound.



Mount the couplings with a locking compound. Mount the hoses to the couplings.

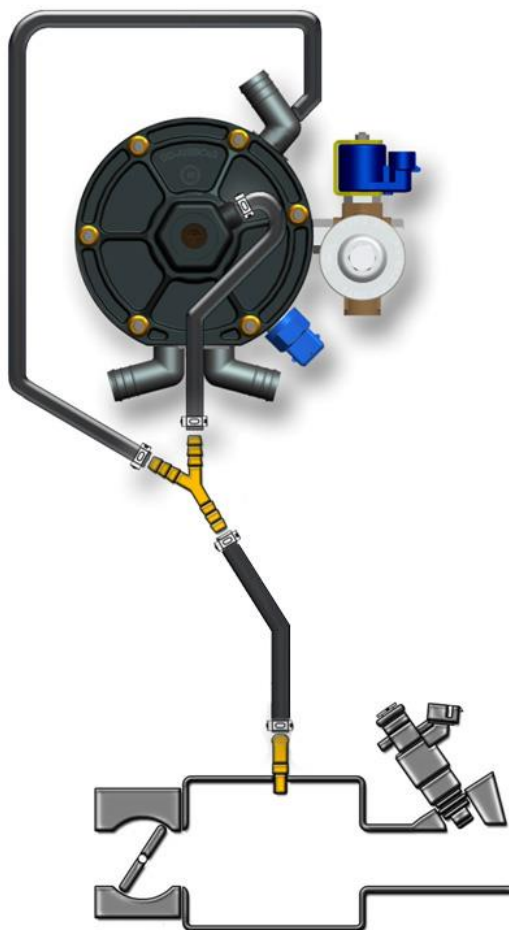


Mount the hoses to the couplings. Cut the hoses on length of 50mm.

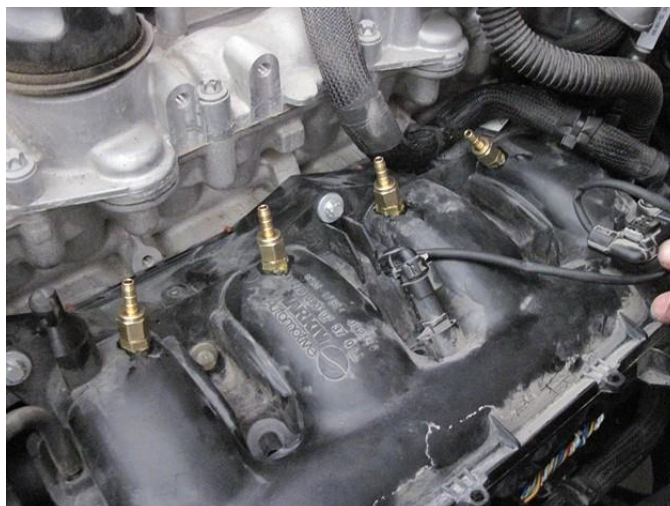
Overpressure / MAP connection



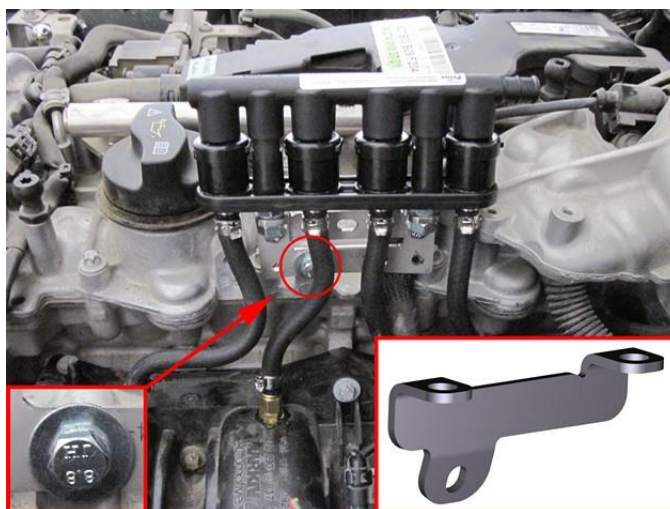
Remove manifold and drill a hole of **5mm** in the inlet manifold. Cut **M6x1** thread in this hole. Mount the VSI coupling with a locking compound in the inlet manifold. Connect the **Ø5mm** overpressure/MAP hose(s).



Mounting the VSI injector rail



Mount the manifold back to the engine, beware of the PTFE hoses!

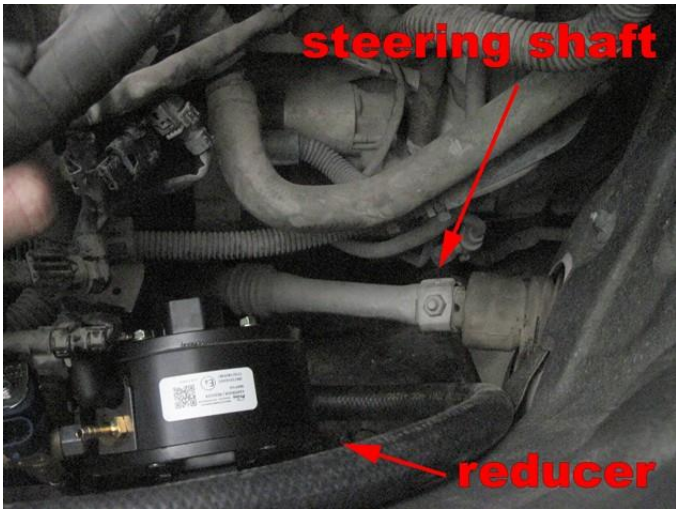


Mount the bracket and the injector rail to the engine.



Mount the hoses to the manifold couplings.

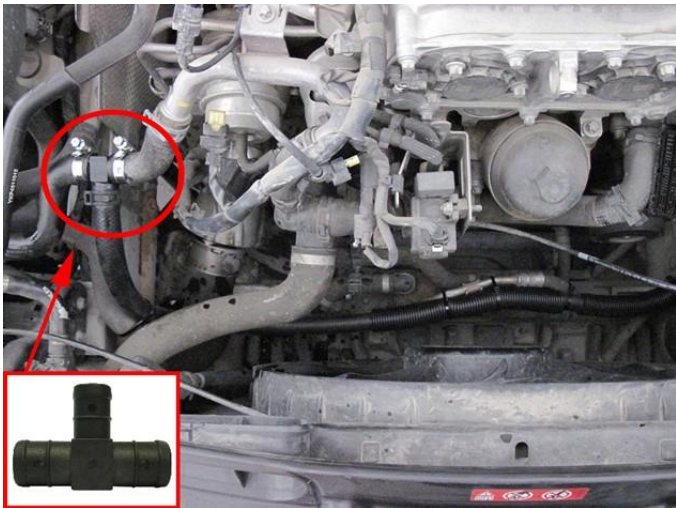
Examples for mounting
(based on W204 C-class)



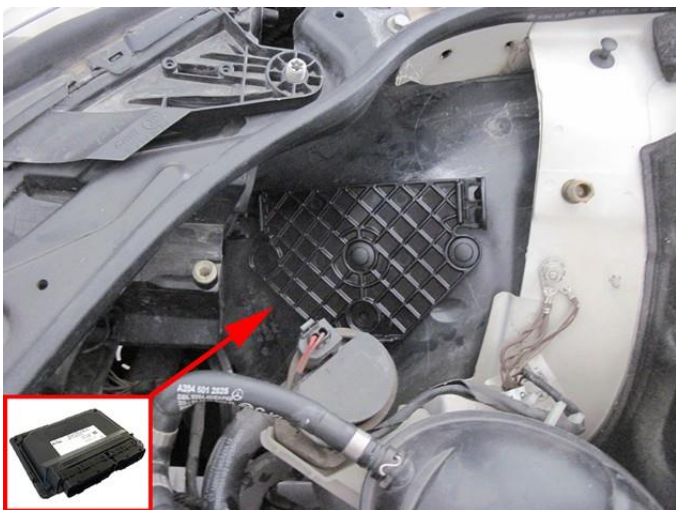
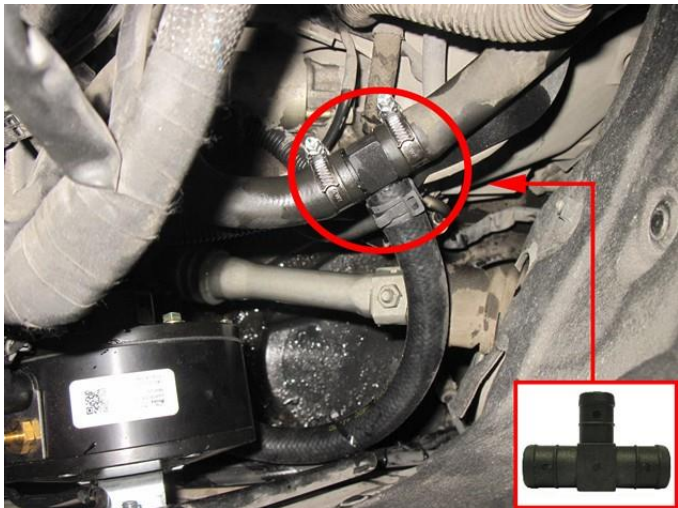
Reducer



Filter



T-pieces

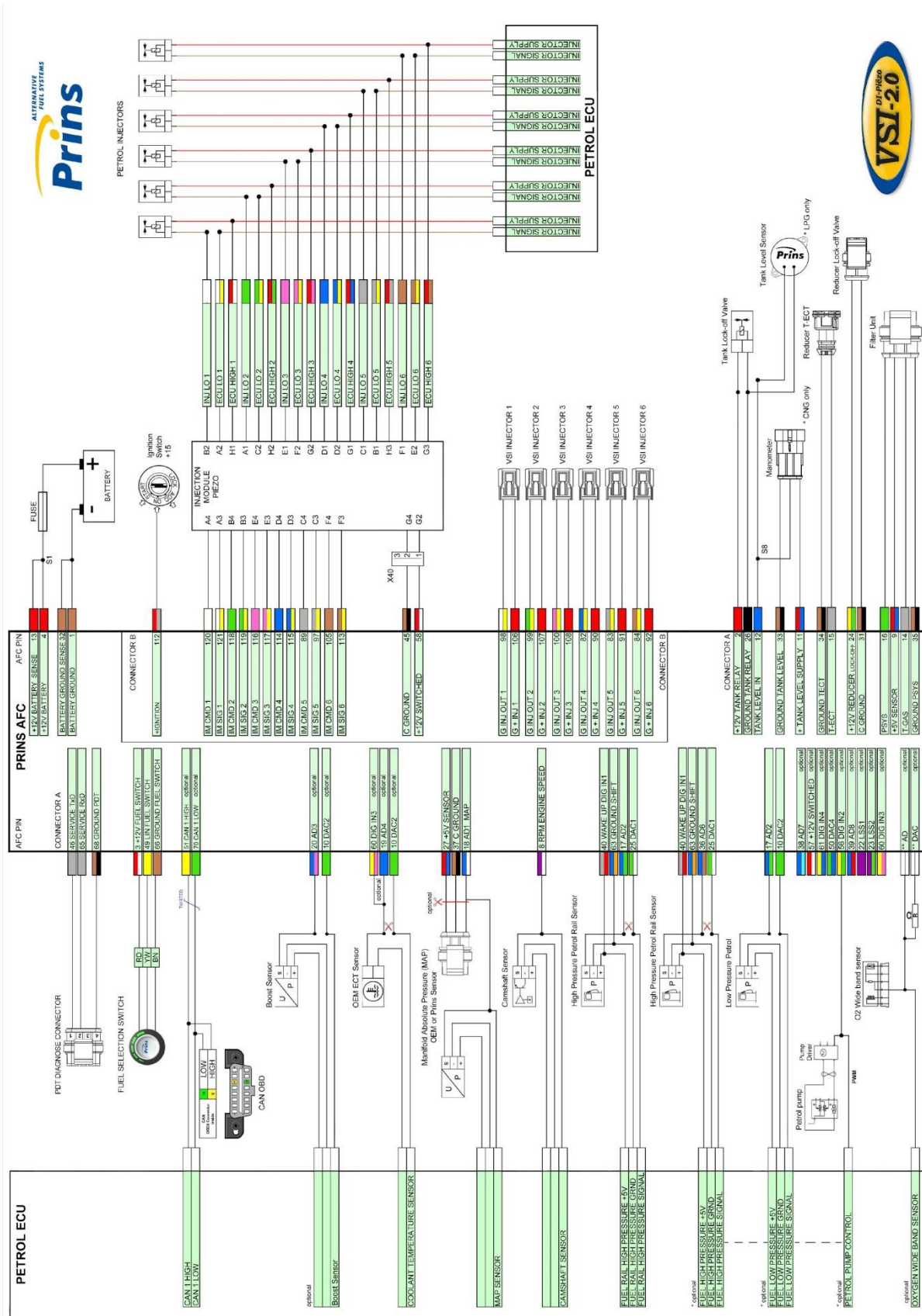


AFC



Injection module (old style IM)

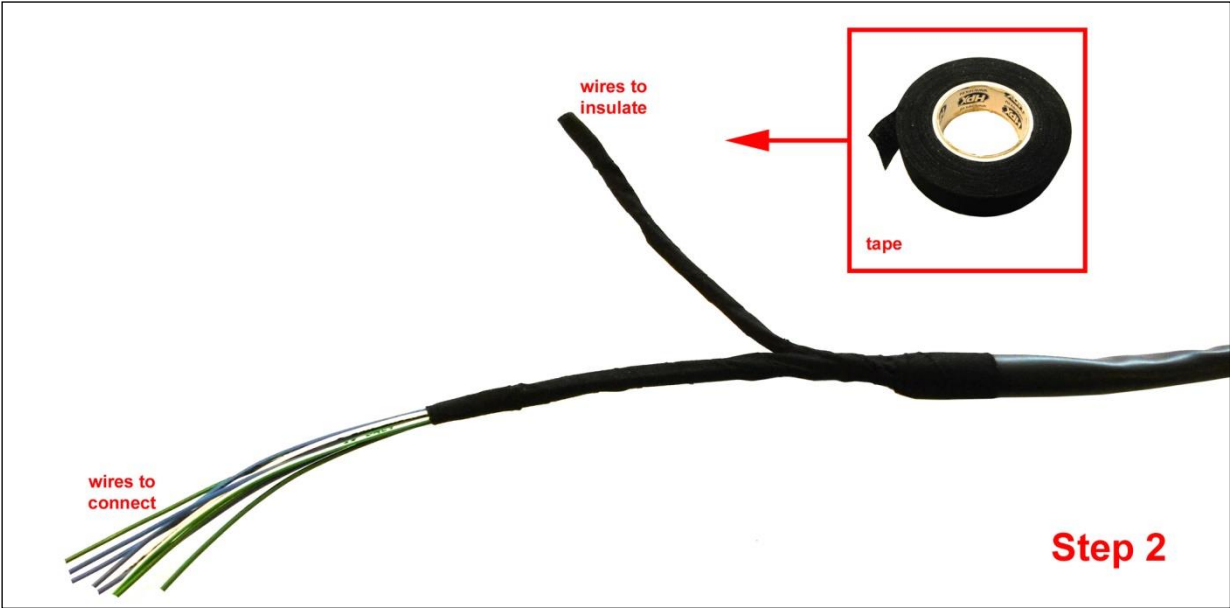
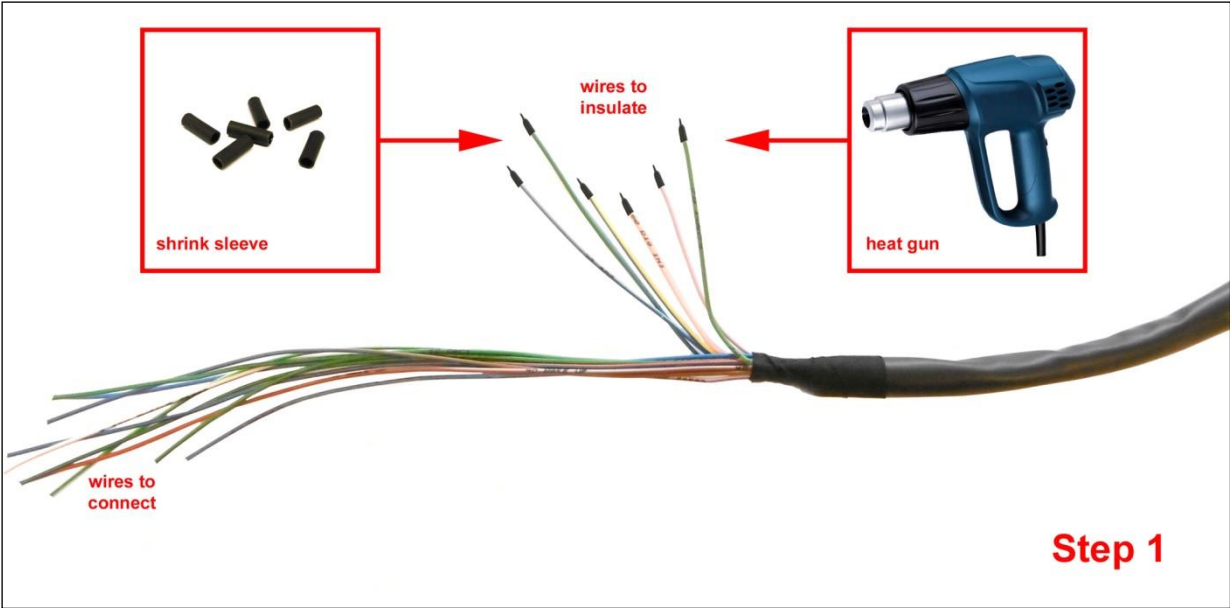
Basic Wiring Diagram



Electrical connections – Insulate

19	AD4	Blue	<i>Insulate</i>
17	AD2	Blue-green	<i>Insulate</i>
38	AD7	Blue-light Blue	<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>
61	DIG IN4	Yellow-blue	<i>Insulate</i>
62	C Ground	Brown-black	<i>Insulate</i>
74	DAC3	Green-pink	<i>Insulate</i>
<i>Insulate additional loose wires</i>			

How to insulate

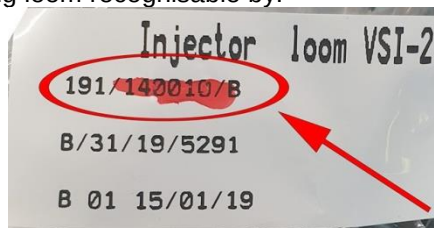


Wiring loom instruction options

Because there is a new development on the Piëzo injection module you have to read this very carefully

Option 1:

If you have an adapted 191/140010 wiring loom recognisable by:



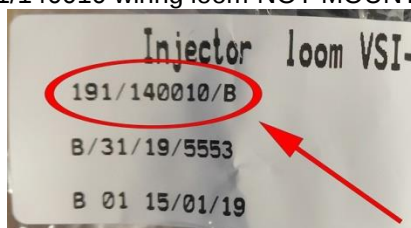
With label marked with a red marker

Everything is already adapted. You can mount this wiring loom without any adaptations.

Option 2:

Go to page 17 → With Piëzo module rev **/A**.

If you have a regular 191/140010 wiring loom NOT MOUNTED in a vehicle and recognisable by:



With original label, no markings

Option 3:

Go to page 21 → Wiring loom adaptations when changing the Piëzo injection module from a rev **/A** to a rev **/B**.

This is for the already converted vehicles with the wiring loom from option 2.

Extra: If you have an unmounted wiring loom from option 2 and you are going to use a rev **/B** Piëzo module on the vehicle you have to do option 2 AND option 3.

Option 4:

Go to page 23 → If you have a 191/130026 wiring loom.



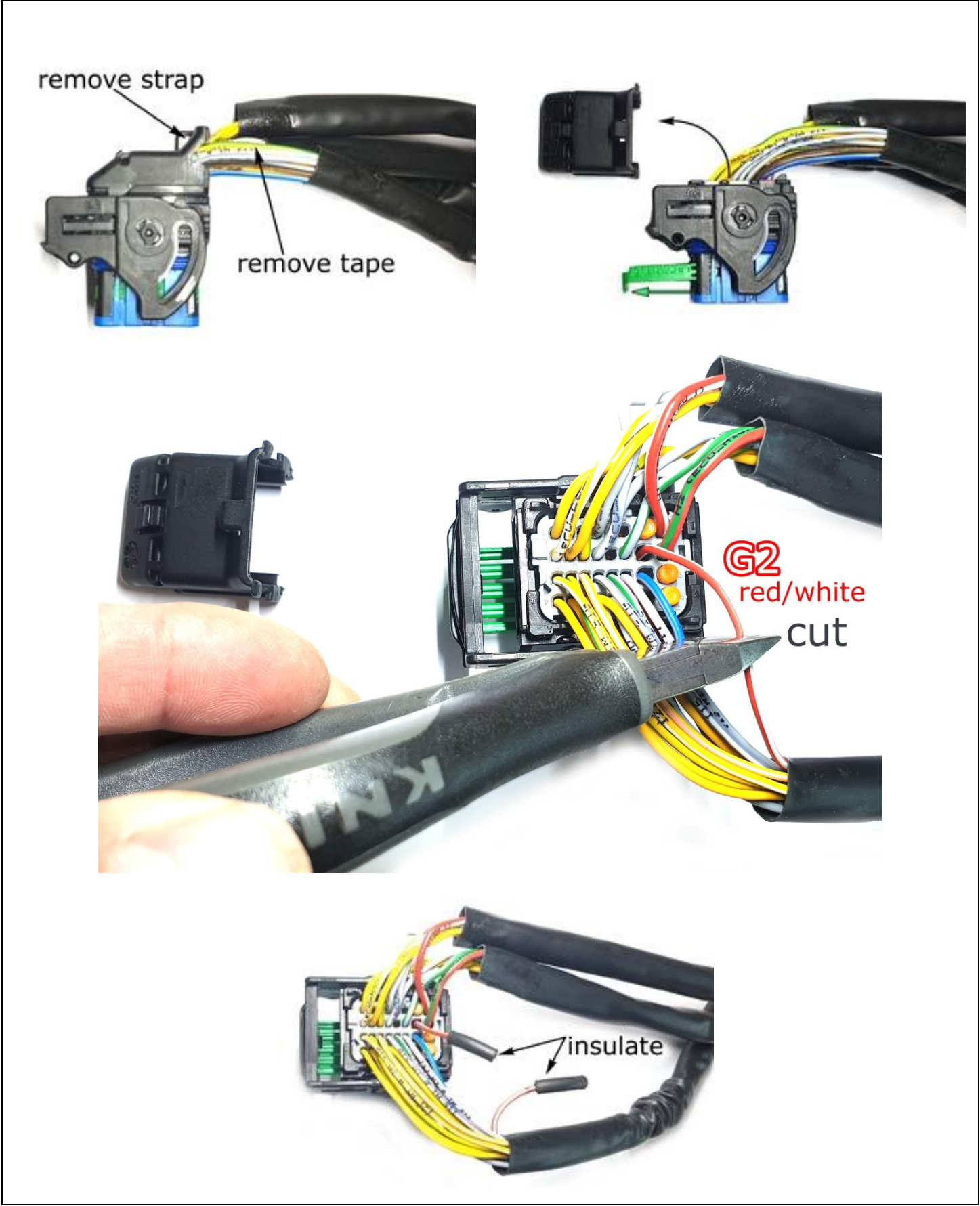
Wiring loom adaption – Option 2

See next pages for detailed instructions

IM connector			
G2		Red-white	Cut and insulate wire
IM connector			Insert wire module 191/140054 into position H4
H4		Red-grey	Connect parallel to wire 112 of the AFC connector
AFC connector			Connect to contact+ / +ignition / +15 ignition
112 + Ignition		Red-grey	see dedicated manual



Wiring loom adaption – Option 2

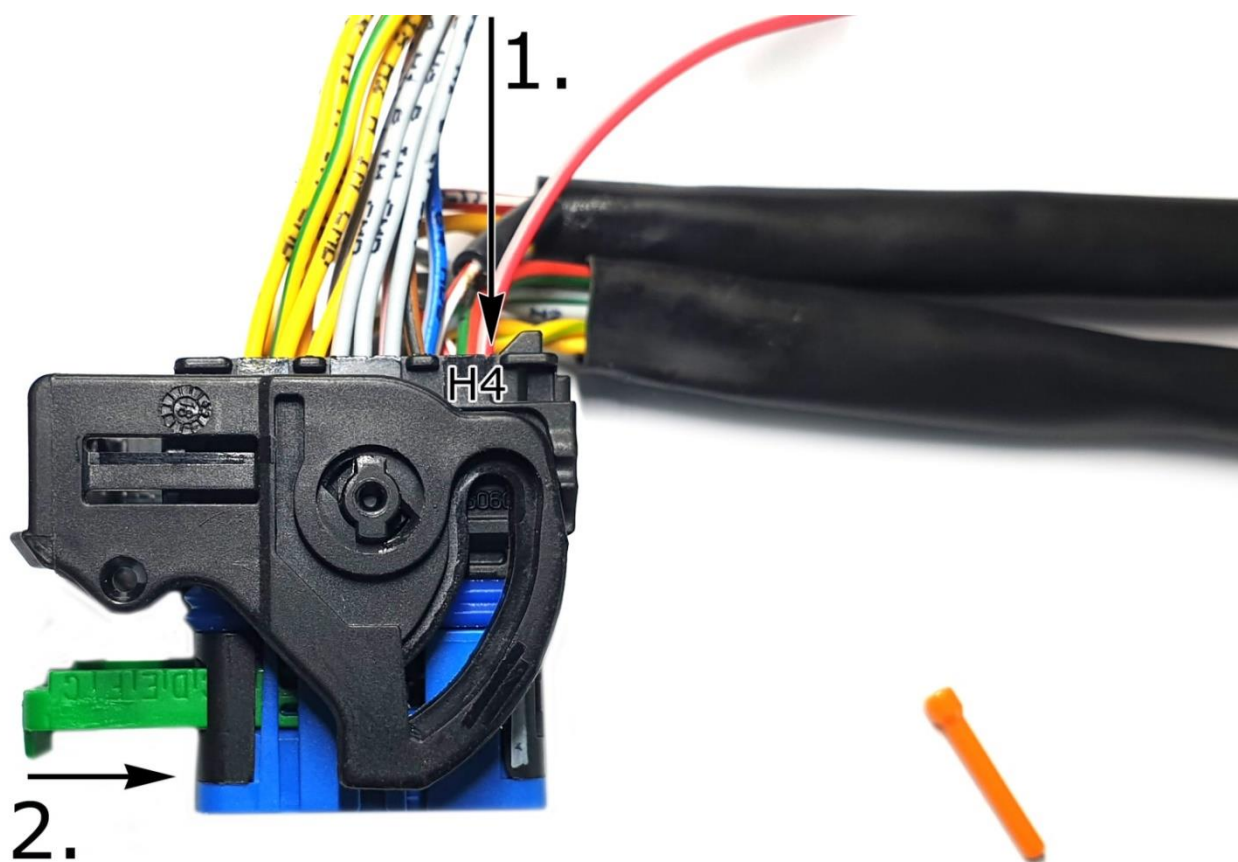


Wiring loom adaption – Option 2



Remove blind plug from position H4

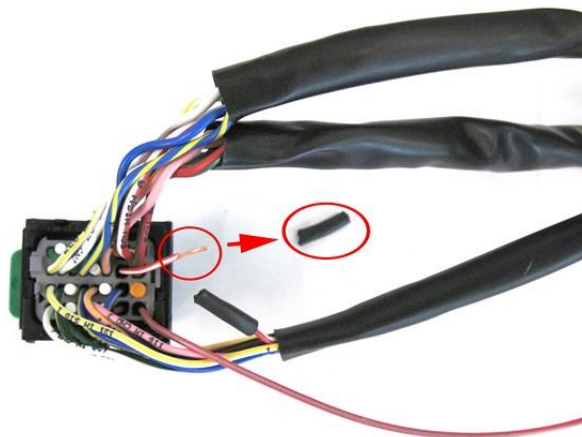
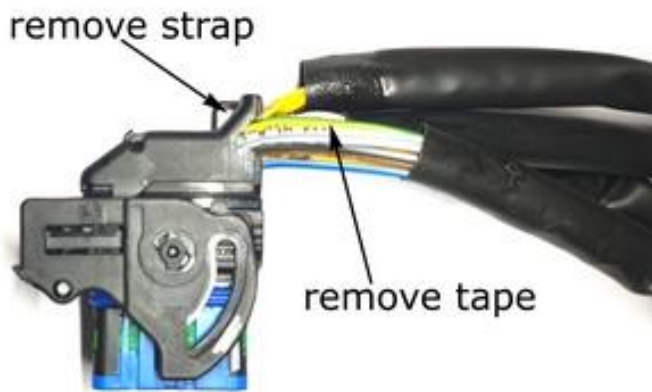
1. Insert wire module 191/140054 into position H4 until it locks
2. Push green lock back in position



Wiring loom adaption – Option 2

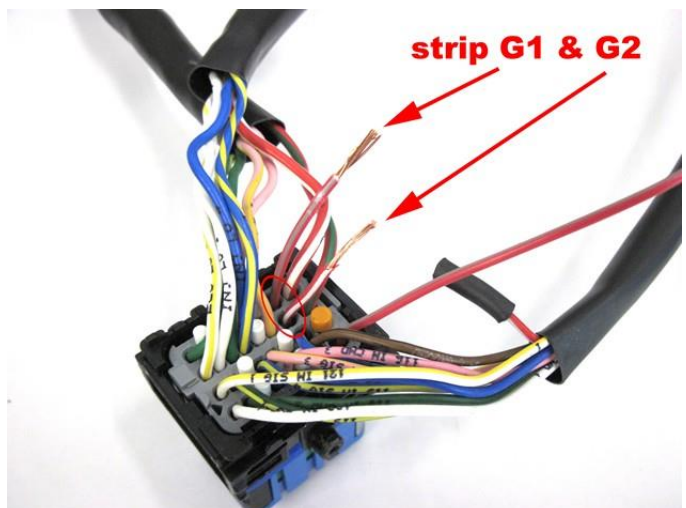
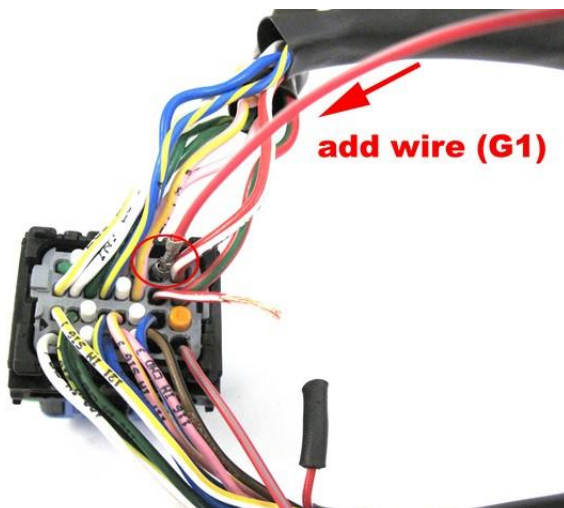
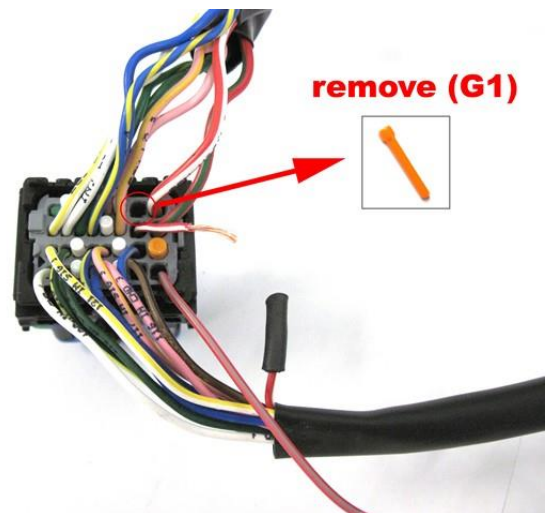


Wiring loom adaption – Option 3



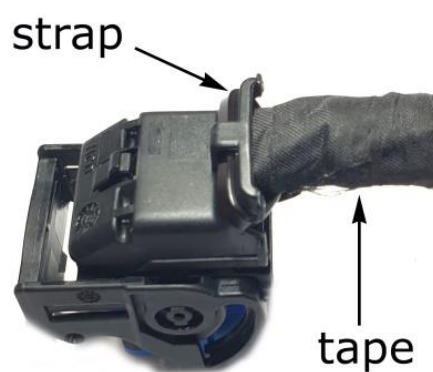
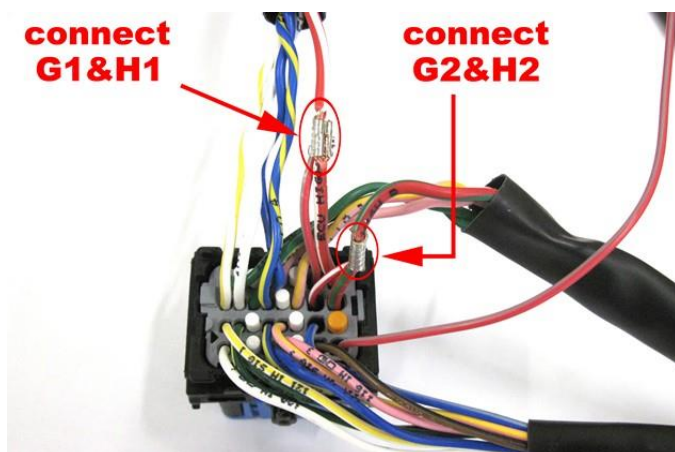
remove

Remove the shrink sleeve / insulation from wire G2. Remove plug from G1.



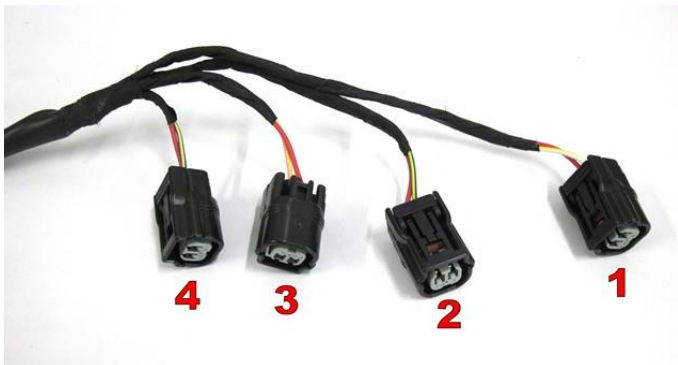
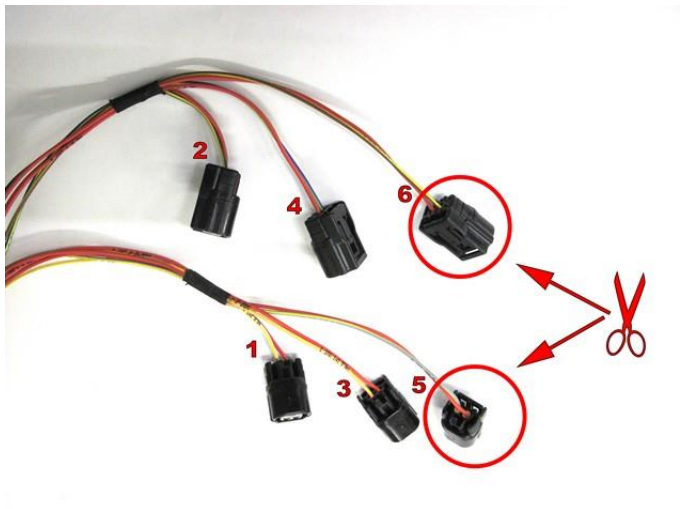
Add an extra wire module 191/140054 to G1. Strip wires G1 and G2.

Wiring loom adaption – Option 3

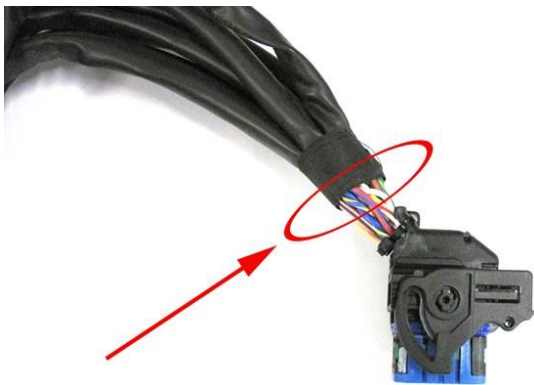
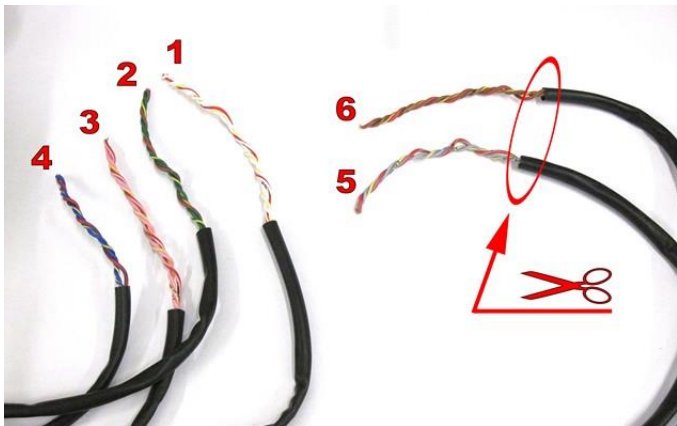


Connect wire **G1&H1** and connect wire **G2&H2** with a permanent connection and insulate.

Wiring loom adaption – Option 4



Remove and insulate the connectors to the LPG injectors from cylinder 5 & 6.
Tape the wiring loom as shown for easy mounting.



Cut and insulate the wires for the interruption to cylinder 5 & 6.
To have a smaller wiring loom it is easier to cut and insulate those wires at the module connector.

Wires to cut and insulate:

INJ LO 5		Grey
ECU LO 5		Grey-yellow
ECU HIGH 5		Red-grey
INJ LO 6		Brown
ECU LO 6		Brown-yellow
ECU HIGH 6		Red-brown

Petrol ECU location

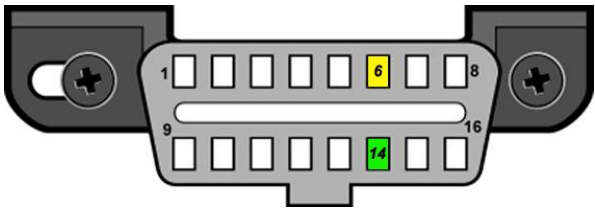
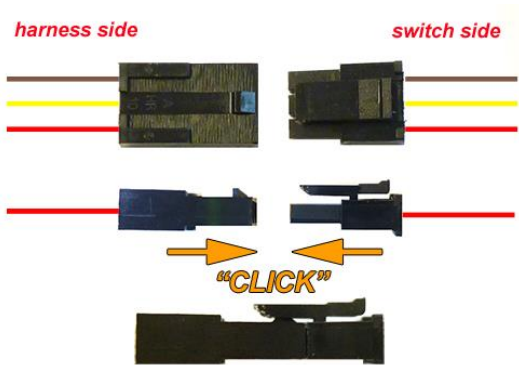
On the left side mounted to the engine / air filter box



The petrol ECU is mounted on the left side TO the engine / air filter box.

Electrical connections INSIDE

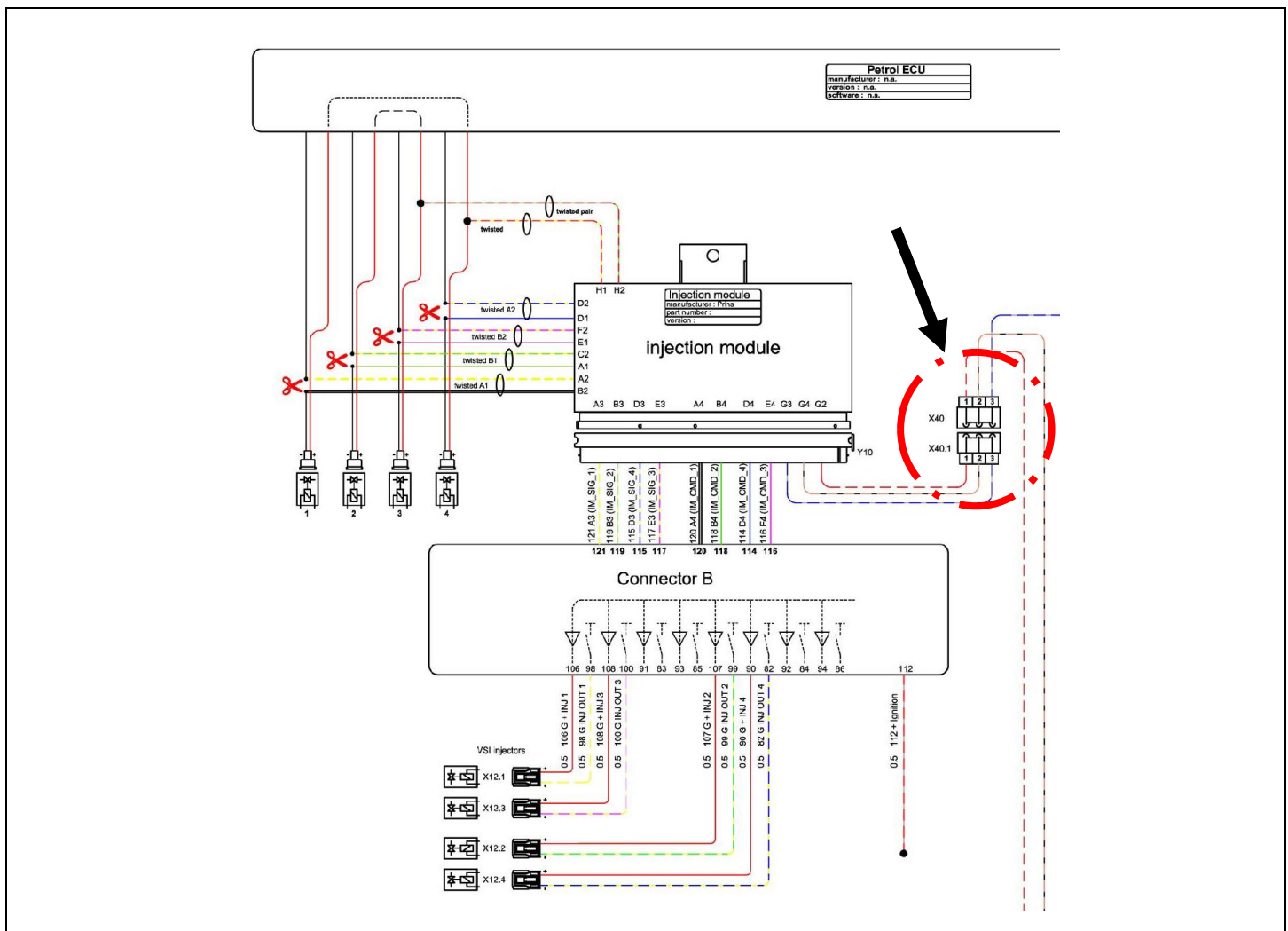
Driver room

51 70	CAN1 High CAN1 Low	Yellow Green	Connect to EOBD diagnose connector. Pin : 6 Pin : 14
			
3-pole micro connector 66 3 49	Ground fuel switch +12V fuel switch LIN fuel switch	Brown-black Red-white Yellow	Connect to switch. Connect the 3-pole connector to the Prins fuel selection switch
			

Electrical connections

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

Wire number / code	Wire colour	Connection
32 Ground sense 1 Ground battery	Brown Brown	Connect to the '-' of the battery; use a ring terminal or solder
4 +12V Battery	Red	Do not place the fuse in the holder before having completed the installation of the LPG system. Connect to the '+' of the battery; use a ring terminal or solder
98 98 G INJ OUT 1 106 106 G + INJ 1	White-yellow red	Connector VSI-injector to cylinder 1. Timing belt side
99 99 G INJ OUT 2 107 107 G + INJ 2	Green-yellow red	Connector VSI-injector to cylinder 2.
100 100 G INJ OUT 3 108 108 G + INJ 3	Pink-yellow red	Connector VSI-injector to cylinder 3.
82 82 G INJ OUT 4 90 90 G + INJ 4	Blue-yellow red	Connector VSI-injector to cylinder 4.



Electrical connections – **Wiring loom 191/140010 (2x ECU HIGH)**

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)

Each VSI wire has a petrol injector / cylinder number printed on the wire, connect this wire to the corresponding petrol injector / cylinder.

Connect the **bicoloured** VSI measuring wire to the **ecu side** (wire code: ecu-lo).

Connect the **corresponding full coloured** VSI wire to the **petrol injector side** (wire code: inj-lo).

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 : Brown-black Location : 96 -pole petrol ecu connector, pin 1
Petrol injector cyl. 4			
INJ LO 4		Blue	Injector side
ECU LO 4		Blue-yellow	ECU side
IM pos. D1 / D2			Colour : Blue-green Location : 96 -pole petrol ecu connector, pin 25
(cyl. 1-4)			
ECU HIGH A		Red-yellow	Injector side
IM pos. H1			Colour : Brown Location : 96 -pole petrol ecu connector, pin 2
Petrol injector cyl. 2			
INJ LO 2		Green	Injector side
ECU LO 2		Green-yellow	ECU side
IM pos. A1 / C2			Colour : Black-red Location : 96 -pole petrol ecu connector, pin 73
Petrol injector cyl. 3			
INJ LO 3		Pink	Injector side
ECU LO 3		Pink-yellow	ECU side
IM pos. E1 / F2			Colour : Brown-blue Location : 96 -pole petrol ecu connector, pin 49
(cyl. 2-3)			
ECU HIGH B		Red-green	Injector side
IM pos. H2			Colour : Black-white Location : 96 -pole petrol ecu connector, pin 74



Electrical connections – **Wiring loom 191/130026 (4x ECU HIGH)**

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)

Each VSI wire has a petrol injector / cylinder number printed on the wire, connect this wire to the corresponding petrol injector / cylinder.

Connect the **bicoloured** VSI measuring wire to the **ecu side** (wire code: ecu-lo).

Connect the **corresponding full coloured** VSI wire to the **petrol injector side** (wire code: inj-lo).

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 : Brown-black Location : 96 -pole petrol ecu connector, pin 1
ECU HIGH 1			Red-white Colour : Brown
IM pos. H1			Location : 96 -pole petrol ecu connector, pin 2

Petrol injector cyl. 2			
INJ LO 2			Green Injector side
ECU LO 2			Green-yellow ECU side
IM pos. A1 / C2			Colour : Black-red Location : 96 -pole petrol ecu connector, pin 73
ECU HIGH 2			Red-green Colour : Black-white
IM pos. H2			Location : 96 -pole petrol ecu connector, pin 74

Petrol injector cyl. 3			
INJ LO 3			Pink Injector side
ECU LO 3			Pink-yellow ECU side
IM pos. E1 / F2			Colour : Brown-blue Location : 96 -pole petrol ecu connector, pin 49
ECU HIGH 3			Red-pink Colour : Black-yellow
IM pos. G2			Location : 96 -pole petrol ecu connector, pin 50

Petrol injector cyl. 4			
INJ LO 4			Blue Injector side
ECU LO 4			Blue-yellow ECU side
IM pos. D1 / D2			Colour : Blue-green Location : 96 -pole petrol ecu connector, pin 25
ECU HIGH 4			Red-blue Colour : White-blue
IM pos. G1			Location : 96 -pole petrol ecu connector, pin 26



Electrical connections

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

3-pole connector		Cut off connector	For measuring the inlet manifold pressure (MAP). insulate insulate
27	+5V Sensor		
37	C ground		
18	AD1		
18	AD 1	Blue-white	Colour : Grey Location : 96 -pole petrol ecu connector, pin 91

			For measuring the engine speed signal. Colour : Yellow-blue Location : 96 -pole petrol ecu connector, pin 34
8	RPM		

36 & 25			High pressure petrol sensor signal interruption. Colour : White-blue Location : 96 -pole petrol ecu connector, pin 67
36	AD 6		
25	DAC 1		

			High pressure petrol sensor ground. Colour : Red-purple Location : 96 -pole petrol ecu connector, pin 12
63	Ground Shift		

			High pressure petrol sensor supply 5V Colour : Purple-white Location : 96 -pole petrol ecu connector, pin 18
40	Wake-up		

112			Connect to +ignition / contact+ (+15). Do not place the fuses in the holder before having completed the installation of the LPG system. Colour : Pink-red or Black Location : 58-pole petrol ecu connector, pin 15
112	+ Ignition		

Electrical connections

Connectors in wiring loom

2-pole blue connector 15 T-ECT 34 Ground T-ECT	Grey Brown-black	For measuring the engine coolant temperature (Tect). 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	For measuring gas pressure and temperature. 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 VSI computer with the diagnostic software. When the VSI computer has not been activated, the switch will keep blinking.
To activate the VSI computer, select function *activate ECM* in the diagnostic software.
3. Check whether the program in the VSI computer 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.

