ALTERNATIVE FUEL SYSTEMS

Prins

Installation manual

PART 2/2

MANUFACTURER	GM
TYPE	(Based on GMC Sierra 2500HD)
ENGINE DISPLACEMENT	6600cc
NUMBER OF VALVES:	16V
ENGINE CODE / NUMBER:	6.6 L8T
ENGINE OUTPUT	299kW (401hp)
FIRING ORDER	1-8-7-2-6-5-4-3
TRANSMISSION TYPE (MT / AT)	AT
VEHICLE CATEGORIES M or N	M
TYPE VSI INJECTOR	KN9 – 82cc
TYPE INJECTION MODULE	2x Gen2 Type 2 + ECOTEC ADD-ON
VERSION	AFC-2.1 DI LPG
MODEL YEAR	2020
PETROL ECU MANUFACTURER / CODE	GM Serv# 12701222 (E93)
SYSTEM APPROVAL NUMBER (R115)	n.a.
LOCATION SYSTEM STICKER	If applicable : right side, centre door post
ENGINE SET NUMBER	*1/4NPT* - 338/121011/A // *XD-5* -338/121012/A
MANUAL NUMBER	076/3303400
DATE	2019-12-03

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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
-	2019-12-03	Release

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, alarm system.
- Do not place the main fuse into the fuse holder before having completed the installation of the VSI system.
- The AFC 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 100 mm 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 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 nr. 099/99928)
- Exhaust gas analyser
- Multimeter
- Oscilloscope
- Prins VSI diagnostic software
- Prins VSI serial interface
- Prins VSI break out box (part nr. 080/70090)
- Torque wrench (25Nm)
- Portable light
- Assortment drill bits 4 to 12 mm
- Assortment cutters (ø 20, 30, 50, 70 mm)
- Punching tool ø 70 mm
- Threading device M10x1 / M6x1
- Round file
- Portable drill or pneumatic drill
- Air gun
- Vacuum cleaner
- Hot air gun
- Allan spanner for inlet couplings 3,5mm (part nr. 099//9970)
- Soldering iron, soldering tin
- Wire-stripping pliers
- Adhesive tape
- Adhesive sealant
- Thread locking compound
- Anti-corrosion agent / black body coating
- Gas leak detection device or foam leak spray
- Shrink sleeves
- Engine coolant

Vehicle check

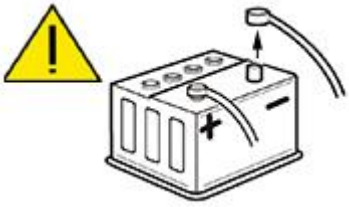
- Check the vehicle drivability on petrol
- Check the fuel system for error codes (scan tool)
- Check if the catalytic converter is in good condition (exhaust gas analyzer)
- Check the condition of the ignition system (spark plugs, cables, coil)

Tightening moments

	Nm	Spanner mm
M4 x 0,7	3.3	7
M5 x 0,8	6.5	8
M6 x 1,0	11.3	10
M7 x 1,0	14.5	11
M8 x 1	24.5	13
M8 x 1,25	27.3	13
M10 x 1	52	15-16-17
M10 x 1,5	54	15-16-17

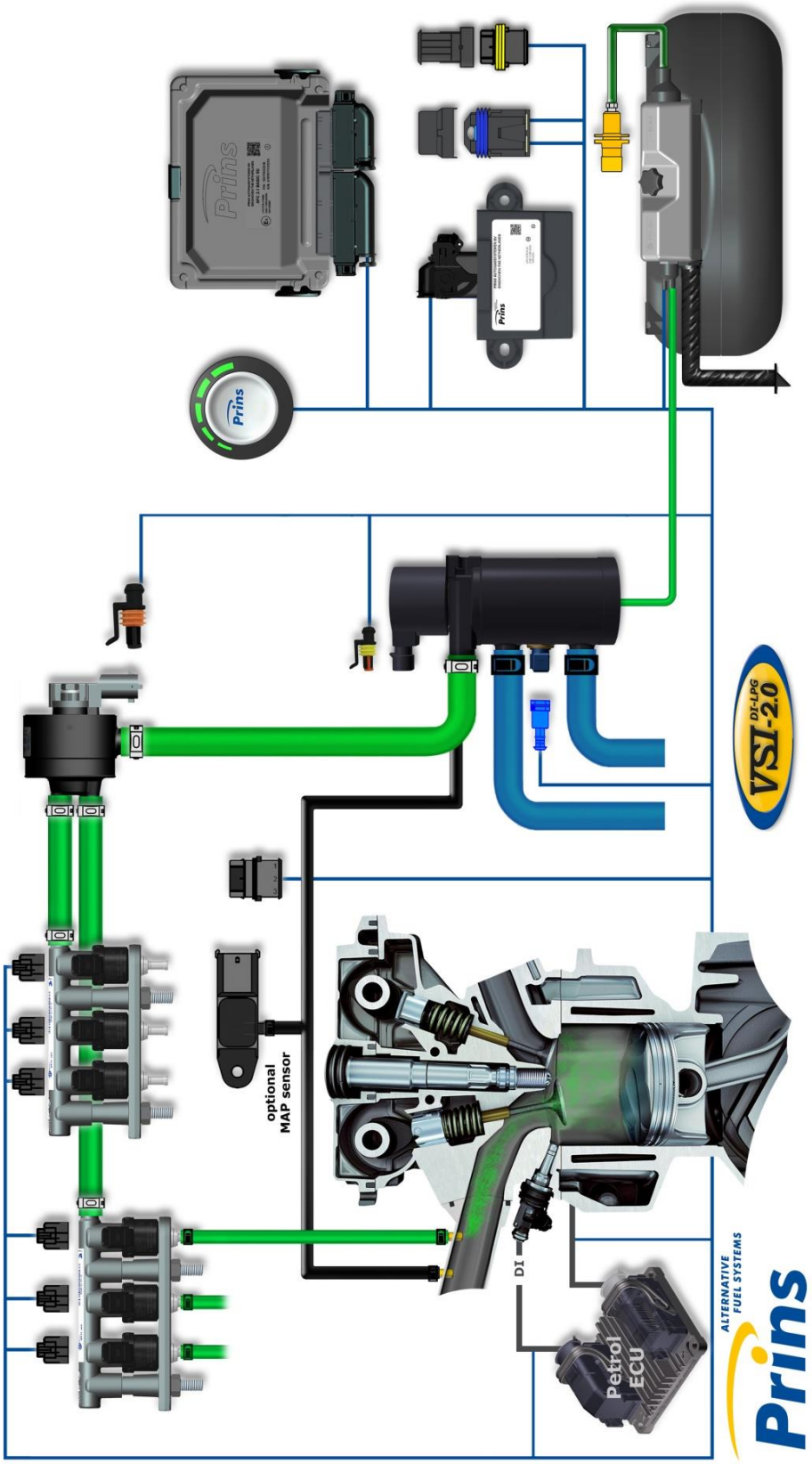
EXPLANATION OF SYMBOLS :

= IMPORTANT, CAUTION



= WEAR SAFETY GOGGLES

Basic System Overview



VSI approval numbers

	
Reducer eVP-500 : E4-67R-010358	Injector rail Prins : LPG E4-67R-010093
	
Filter unit T1 / T2 Prins : LPG E4-67R-010096 CNG E4-110R-000028 Filter unit Keihin: LPG E4-67R-010177 CNG E4-110R-000091	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

Example - VSI component location overview

(based on a 20230 GMC Sierra 2500HD)

eVP-500

AFC

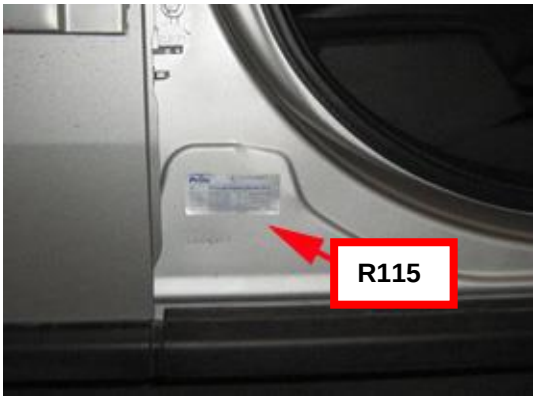
Fuse box

2 Rails

2 IM's + ADD-on

Filter

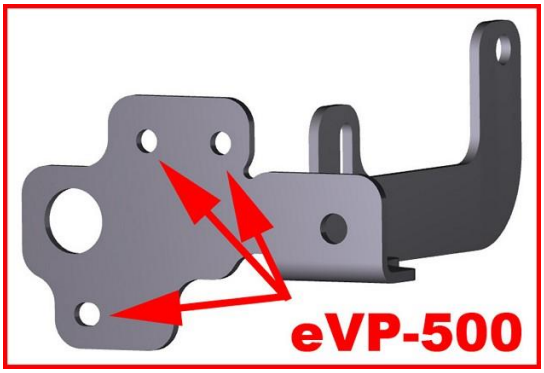
Petrol ECU

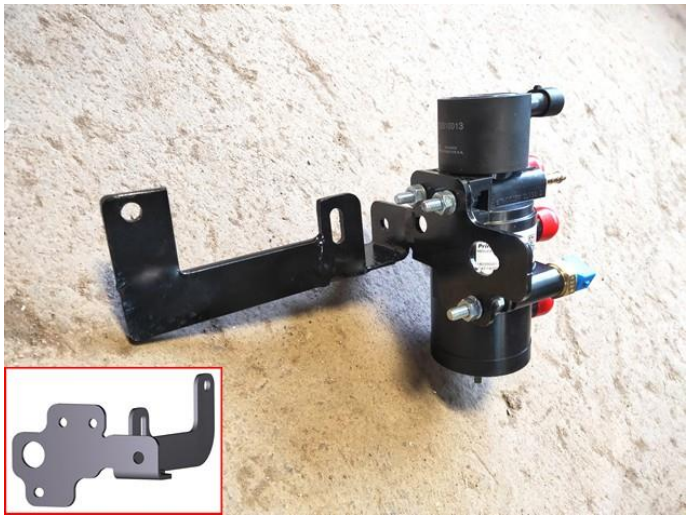


If applicable, R115 approval sticker location:
Right side centre door post

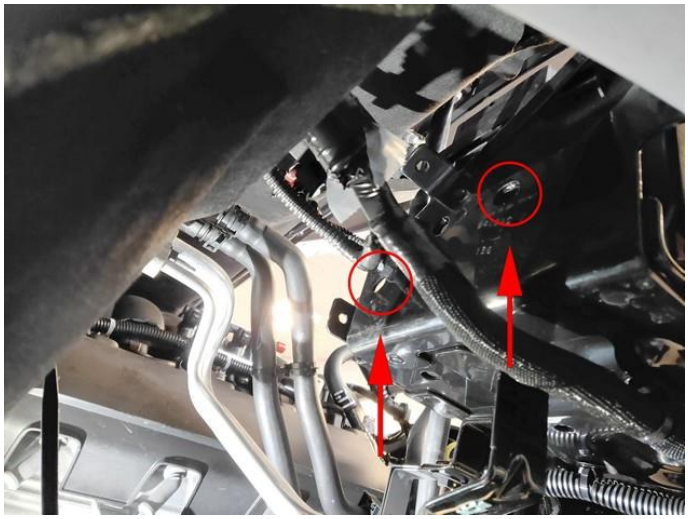
Example - Mounting the eVP-500

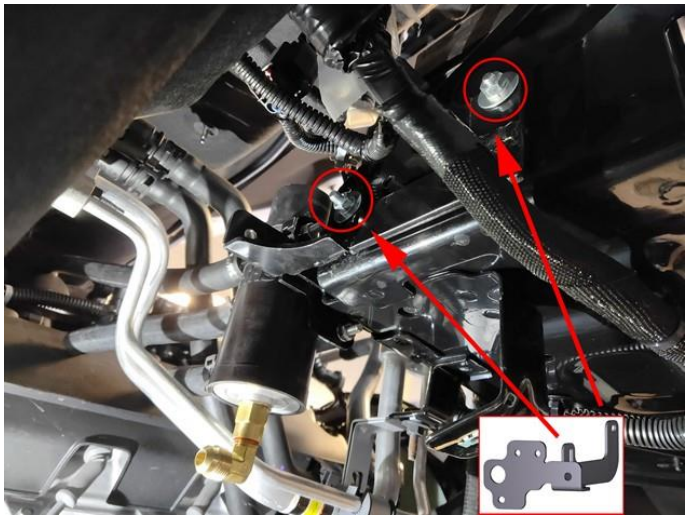
(based on a 2020 GMC Sierra 2500HD)





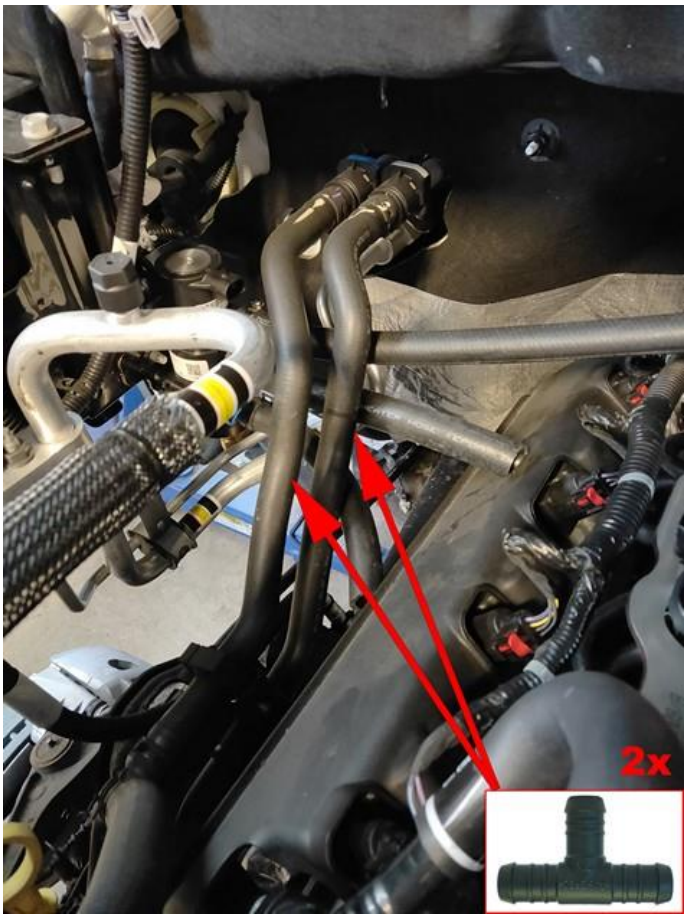
Mount the eVP-500 to the bracket and mount hoses.

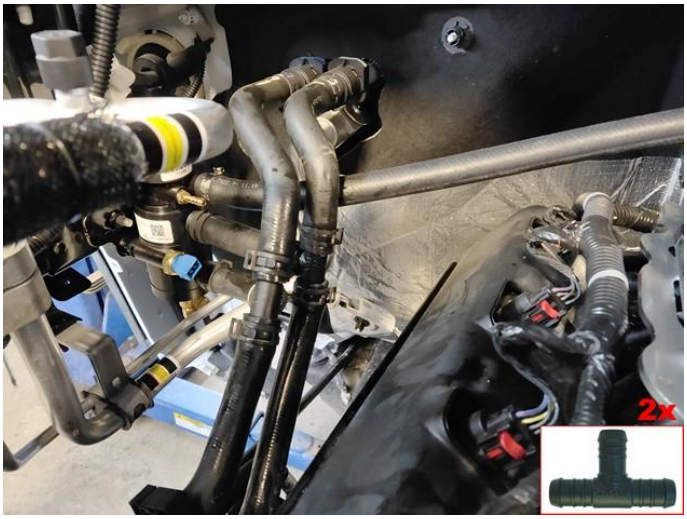


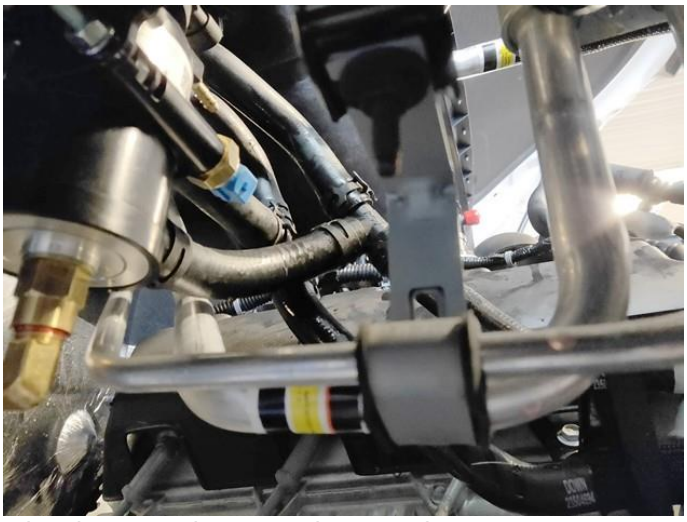


Mount the bracket with the eVP-500 to the battery holder.

Example - Engine coolant connections



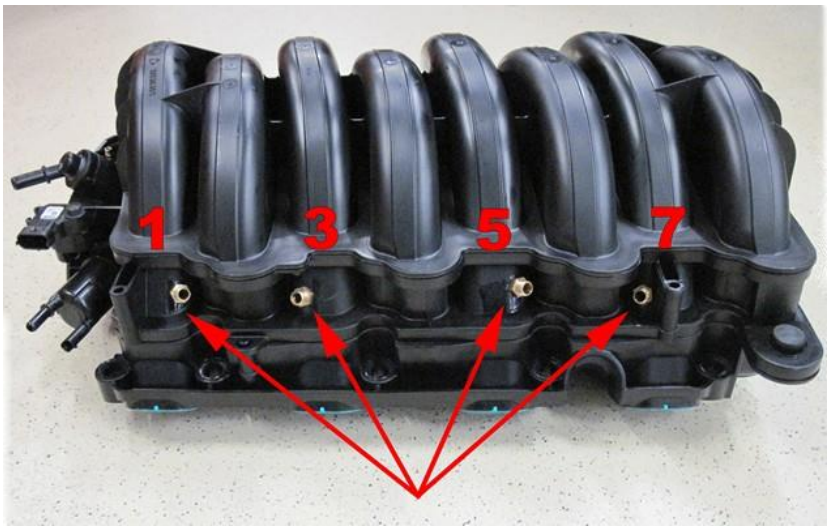


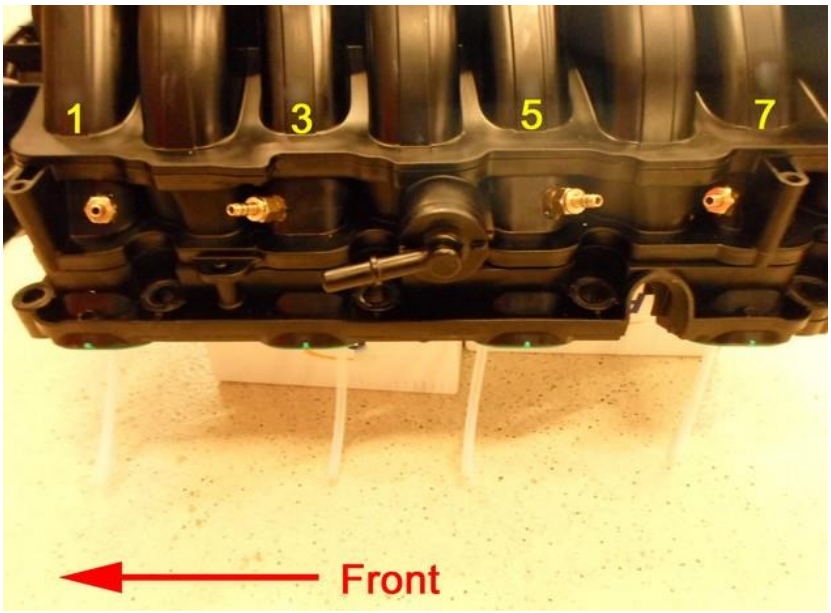


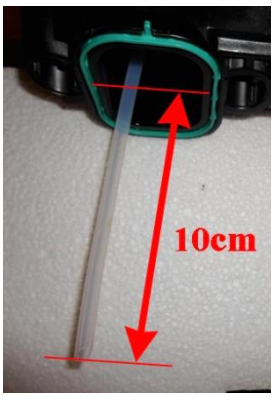
Mount the T-pieces (16x16x16mm) to the coolant hoses and connect the water hoses.

Installation of the inlet couplings cylinder 1-3-5-7

Remove the inlet manifold. Drill **4** holes of **8,5**mm into the inlet manifold. Cut **M10x1** thread in these holes.
Mount the inlet couplings with a locking compound.
Watch out that the lock compound doesn't come inside the inlet couplings.



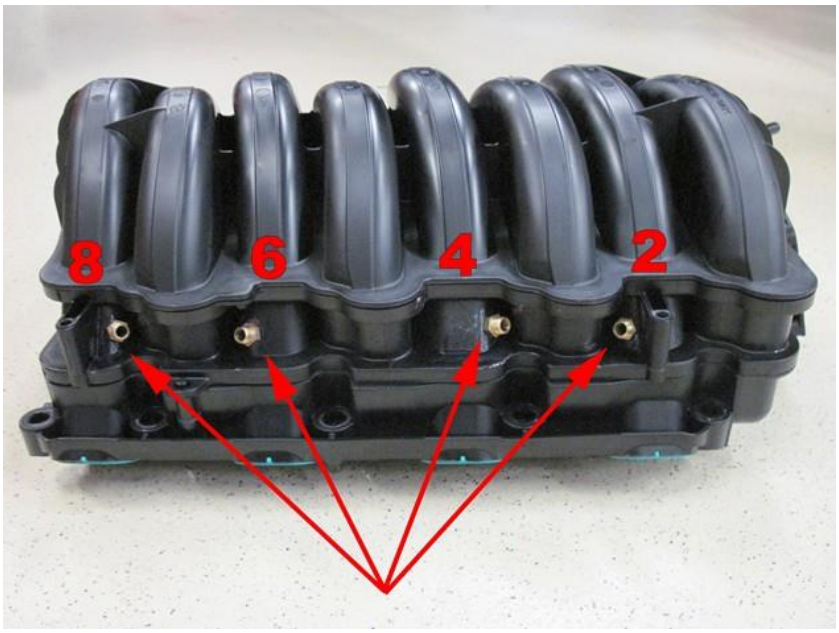


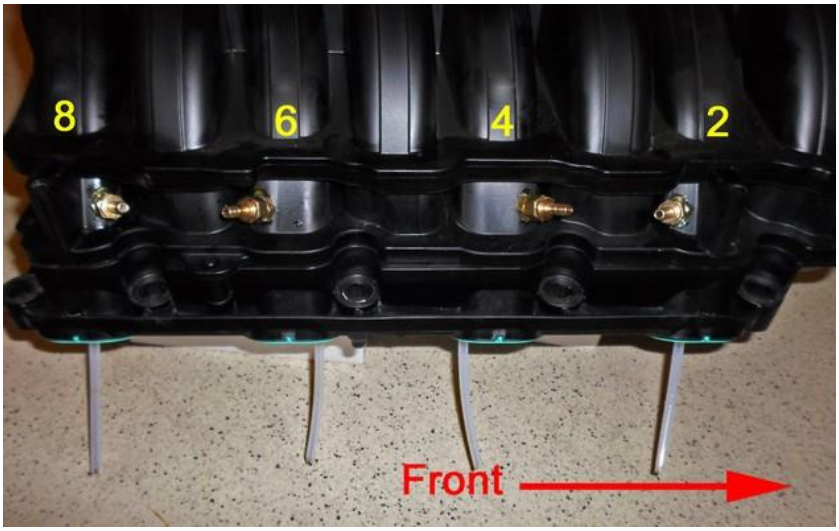


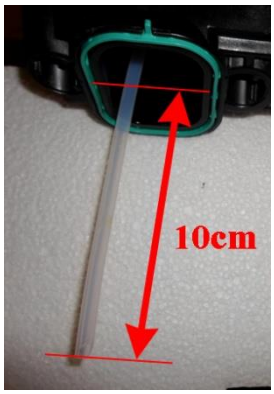
PTFE hoses 4x 20cm, cut on length when mounted.

Installation of the inlet couplings cylinder 2-4-6-8

Remove the inlet manifold. Drill **4** holes of 8,5mm into the inlet manifold. Cut **M10x1** thread in these holes.
Mount the inlet couplings with a locking compound.
Watch out that the lock compound doesn't come inside the inlet couplings.

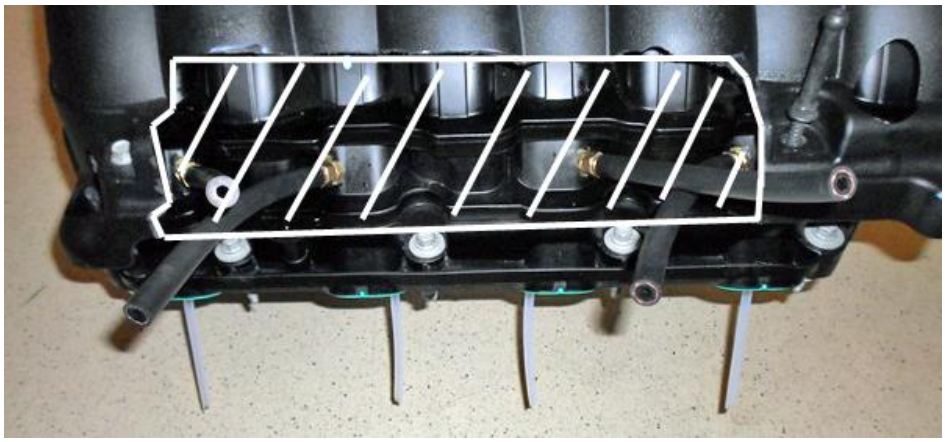


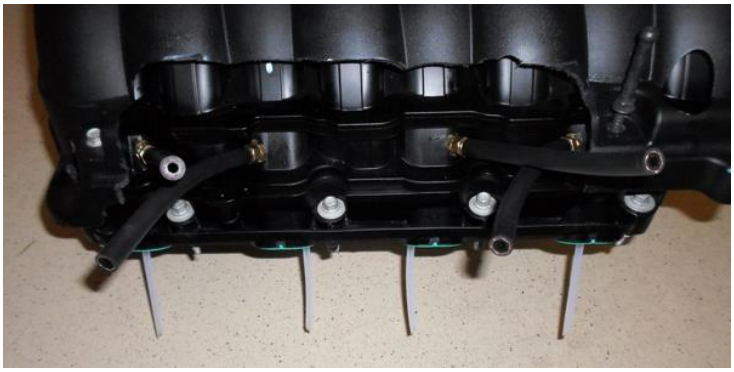




PTFE hoses 4x 20cm, cut on length when mounted.

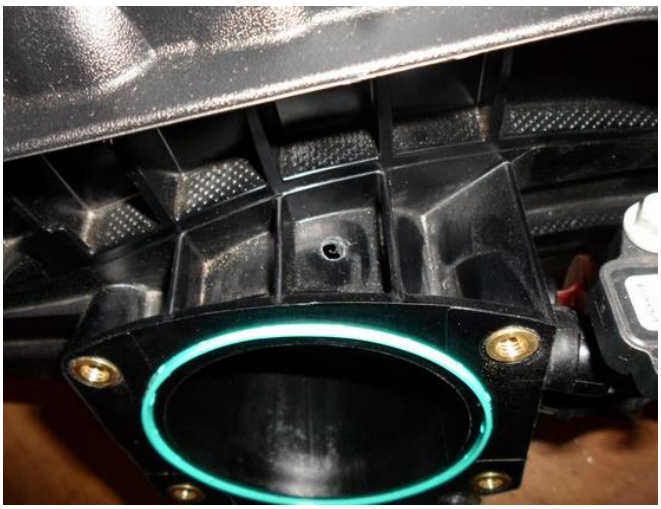
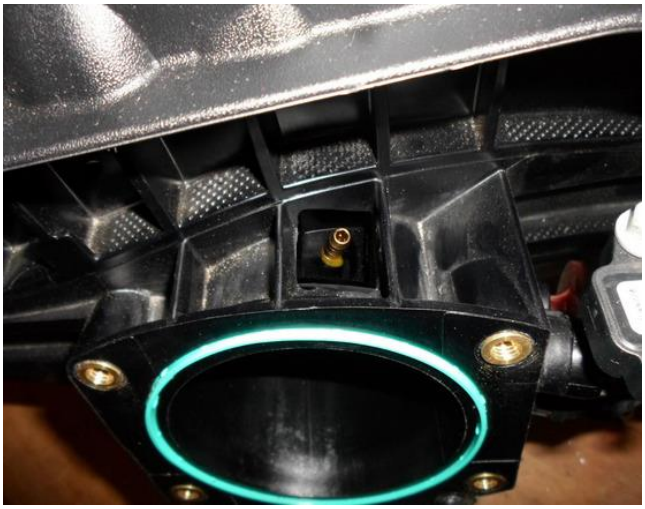
Modify the intake manifold cover



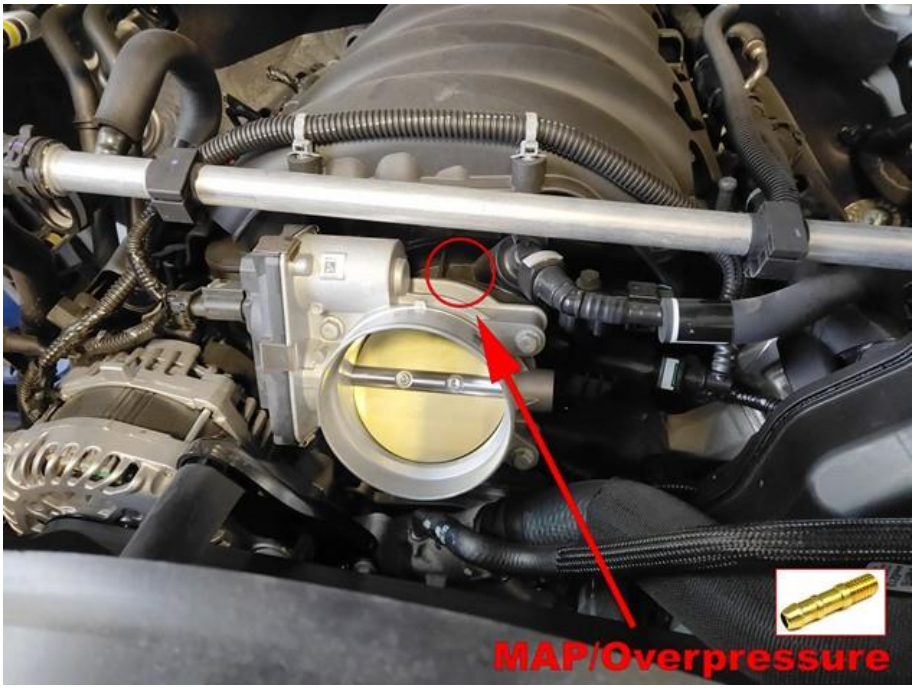


Overpressure coupling

Drill **1** hole of **5**mm into the inlet manifold. Cut **M6** thread in this hole.
Mount the inlet coupling with a locking compound.
Watch out that the lock compound doesn't come inside the inlet coupling

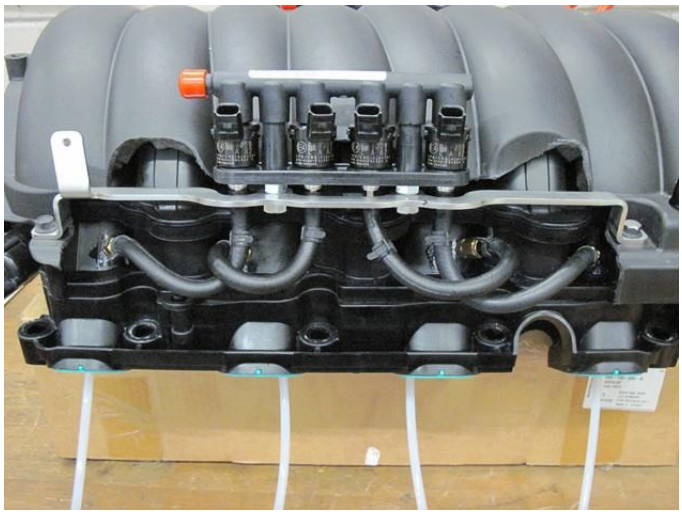
Drill **1** hole of **5**mm into the inlet manifold. Cut **M6** thread in this hole.

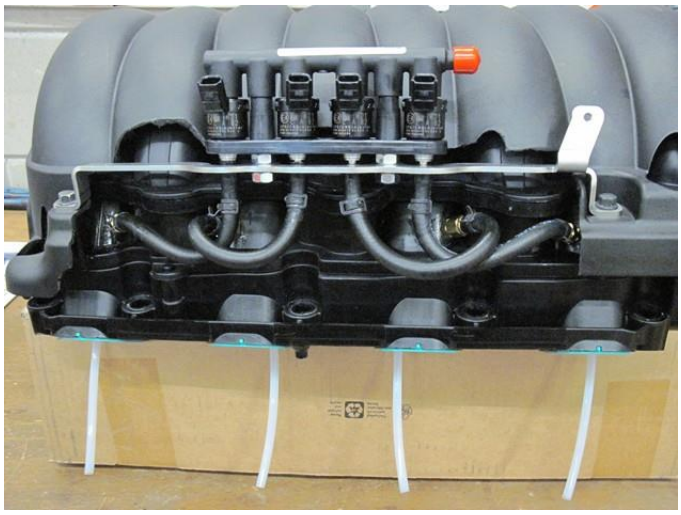


Mount the coupling with a locking compound.

Mounting the injector rails

Temporarily mount the brackets to the manifold.





Turn the injectors from 1 rail and mount both rails to the brackets and connect the 5mm hoses.

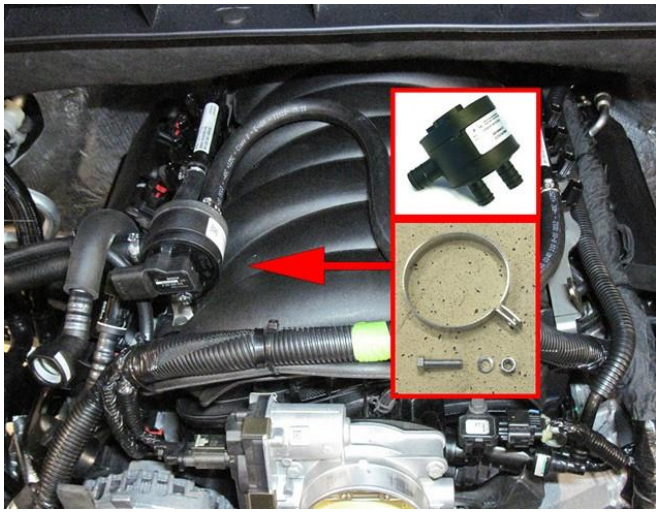
Before mounting the manifold, unscrew the rails for mounting.

Example mounting - Manifold / Injector Rails / Filter

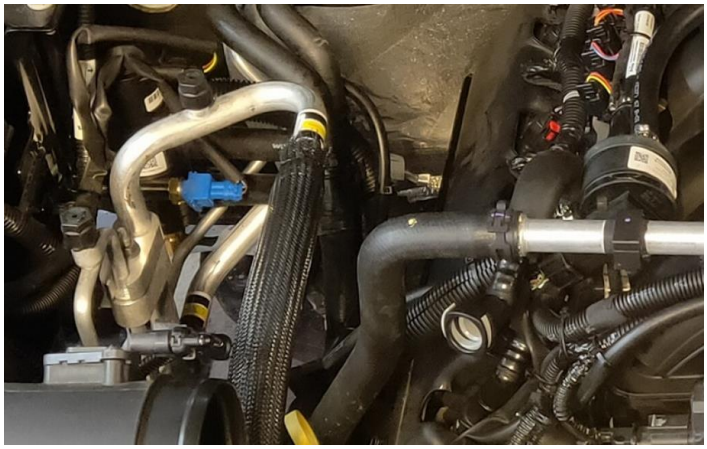
(based on a 20230 GMC Sierra 2500HD)

When using a dedicated wiring loom: connect the wiring loom to the petrol injector connectors before mounting the manifold!!


Mount the brackets with rails back to the manifold.

Mount the filter (with sensor) to the bracket on the right bracket and connect the 11mm hoses from filter to both rails.




Mount the 16mm hose from the eVP-500 to the filter and mount the 5mm hose to the MAP-coupling.

LPG hoses

(based on a 20230 GMC Sierra 2500HD)

Hose (Ø..mm)	From component	To component	Hose length +/- (approx. cm)
16	eVP-500	Prins filter unit	60
11	Prins filter unit	Injector rail	7
11	Prins filter unit	Injector rail	60
5	eVP-500 overpressure	Inlet manifold coupling	90
5	VSI injector 1	Inlet manifold coupling cyl.1	14
5	VSI injector 2	Inlet manifold coupling cyl.2	14
5	VSI injector 3	Inlet manifold coupling cyl.3	14
5	VSI injector 4	Inlet manifold coupling cyl.4	14
5	VSI injector 5	Inlet manifold coupling cyl.5	14
5	VSI injector 6	Inlet manifold coupling cyl.6	14
5	VSI injector 7	Inlet manifold coupling cyl.7	14
5	VSI injector 8	Inlet manifold coupling cyl.8	14
6	Inlet manifold coupling cyl.1	PTFE hose cyl.1	20
6	Inlet manifold coupling cyl.2	PTFE hose cyl.2	20
6	Inlet manifold coupling cyl.3	PTFE hose cyl.3	20
6	Inlet manifold coupling cyl.4	PTFE hose cyl.4	20
6	Inlet manifold coupling cyl.5	PTFE hose cyl.5	20
6	Inlet manifold coupling cyl.6	PTFE hose cyl.6	20
6	Inlet manifold coupling cyl.7	PTFE hose cyl.7	20
6	Inlet manifold coupling cyl.8	PTFE hose cyl.8	20

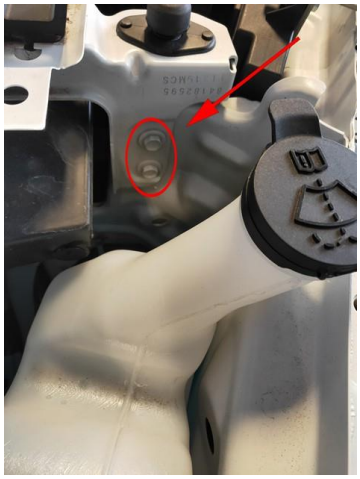
General info.

Cut the LPG hoses on length
Cut the PTFE hoses on length as shown in the pictures
Make sure that the inlet of the PTFE hose faces the injector outlet.

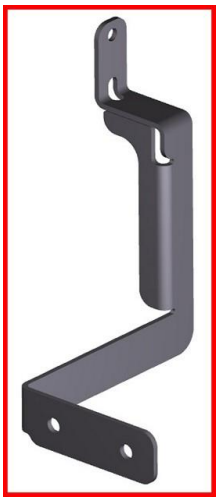
Please observe that there is no damage or fouling to the hoses.

Example - Mounting the AFC

(based on a 20230 GMC Sierra 2500HD)



Mount the AFC bracket on the original bolts next to / in front of the washer fluid.

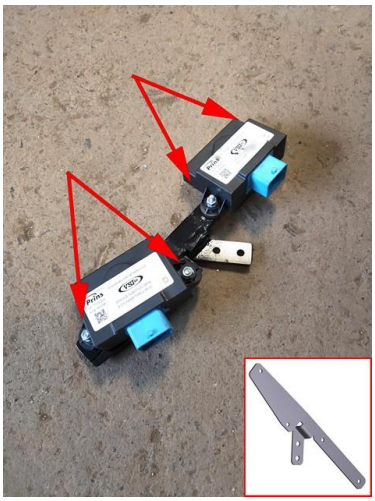


Mount the plastic AFC bracket with the quick clips to the (steel) bracket and mount to the vehicle (from below).

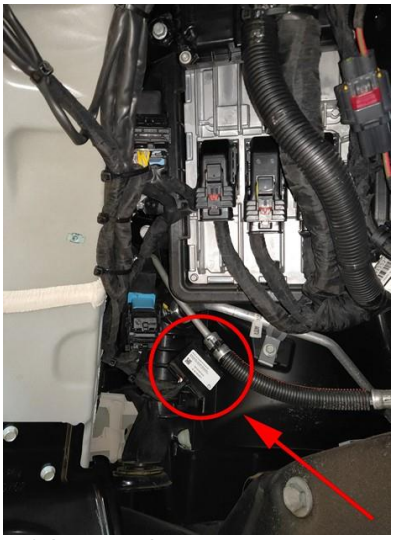
Mount the AFC to the bracket Easy access from below.

Example - Mounting the DI IM's / Add-on module / Fuse & diagnostic connector

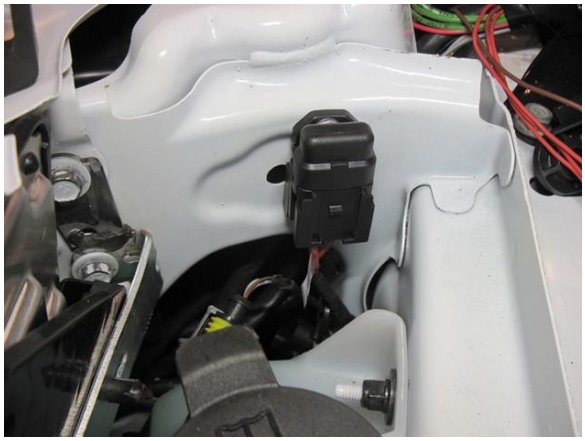
(based on a 20230 GMC Sierra 2500HD)



Mount the 2 injection modules to the bracket.



Mount the bracket to the original points on the left side of the petrol ECM.
Mount the Add-on module next to the injection modules. For the connection, see the electric connections.

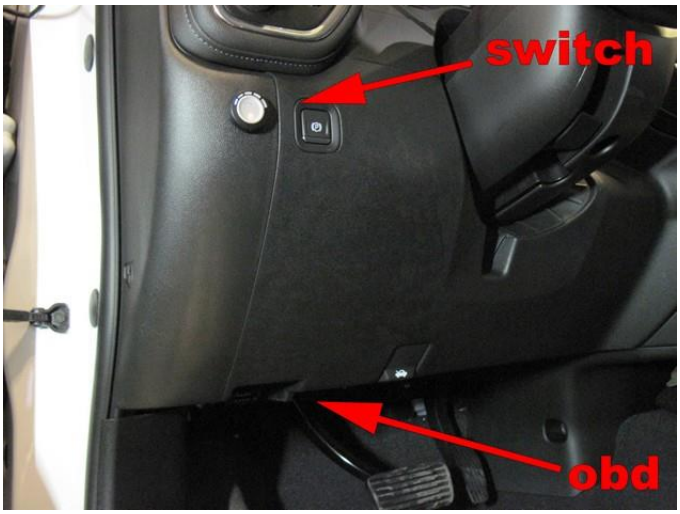


The fuse & diagnostic connector are located in front of the AFC bracket.

Fuel selection switch – option 1 / EOBD CAN wiring

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

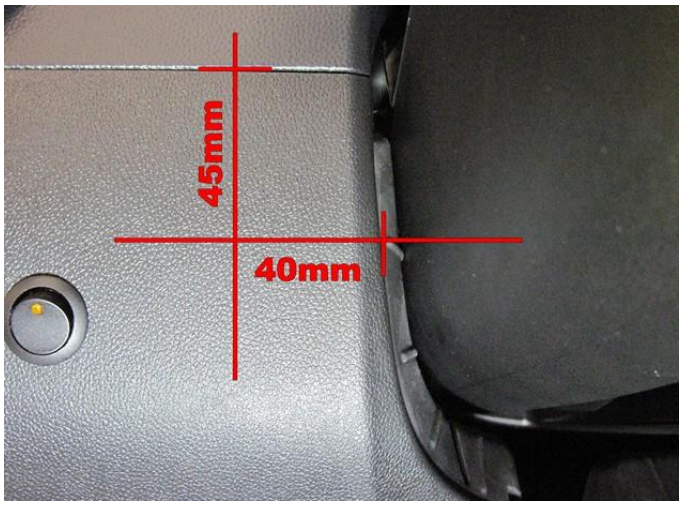
Grommet to use for wiring transit to the driver room.



Drill hole Ø8,3mm and mount switch.

OBD connector

Fuel selection switch – option 2



Mark & drill hole Ø32mm.

Mount the cup and switch. For mounting the cup, use a clear sealant and no superglue, be aware of the drying time. Superglue will ruin the dashboard.

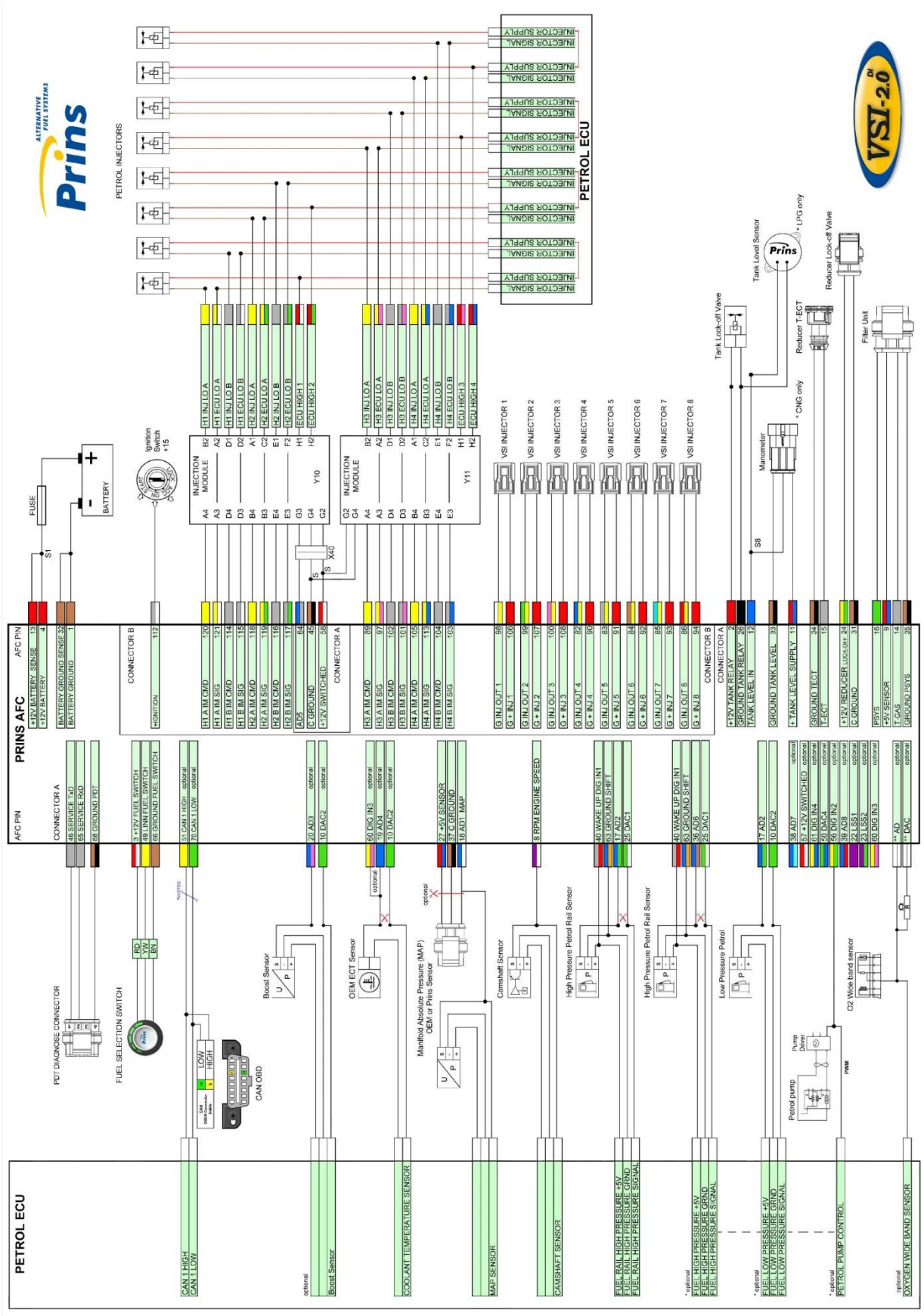
Electrical connections - Add-on Module(s) - only /A revision!

Check if you use a revision /A or a revision /B add-on module.
If you are using a /B module, there is no need to connect 2 modules parallel as shown below!

Revision /A use 2 modules. Revision /B use only 1 module.

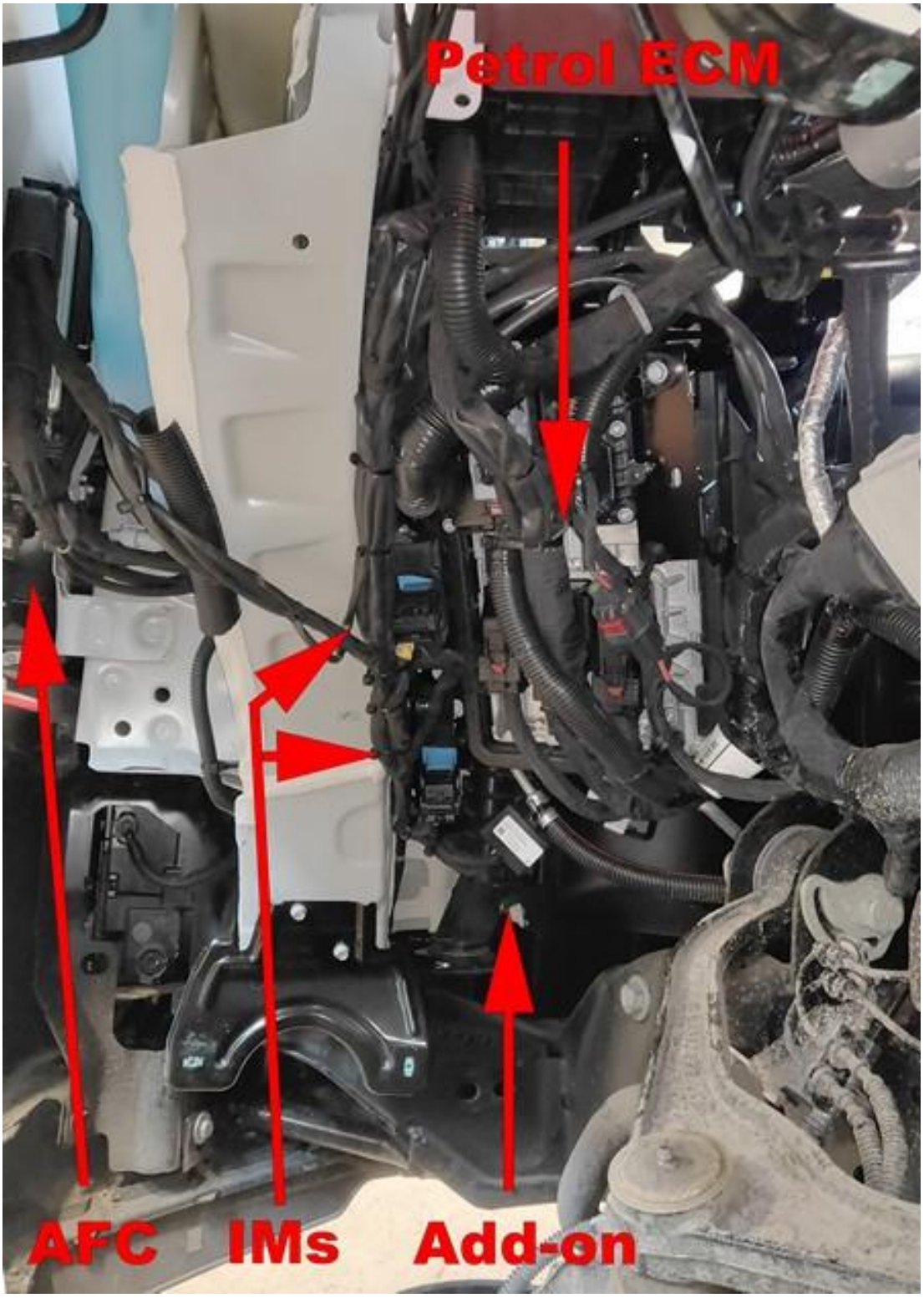
Solder/connect the **white** wires from the 1st module to all the **white** wires from the 2nd module
It is not important which **white** wire from the 1st module connects to what **white** wire from the 2nd module.
Solder/connect the **red/grey** wire from the 1st module to the **red/grey** wire from the 2nd module.
Be sure to insulate in a proper way.

Basic Wiring Diagram



Example - Overview Components

(based on a 2020 GMC Sierra 2500HD)



Universal Wiring - Petrol ECU location / connectors

The Petrol ECU is located in the left inner wheel arch behind the plastic mud guard.

Universal Wiring - Electrical connections (remarks)

Before mounting the wiring to the AFC and/or the vehicle:

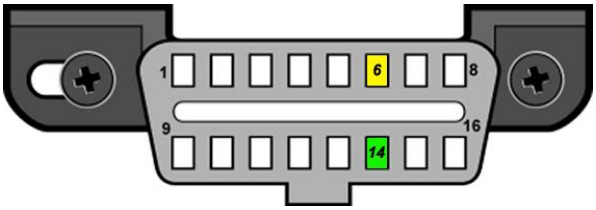
- **Mount the extra wiring module on pin 29 & 71 from the AFC connector**
- **Remove the MAP connector and add the wiring from the MAP connector to the rest of the wiring connected to the ECU.**
- **Connect / solder the ECOTEC add-on module to the wiring loom to both the injection modules. Be sure to insulate on a proper way.**
- **Extend wire 10 DAC2, 17 AD2 & 56 DI2 with the supplied 3-core wiring.**

Wire	Original colour	To colour
10 DAC2	Green	Black
17 AD2	Blue-green	Blue
56 DI2	Yellow-green	Red

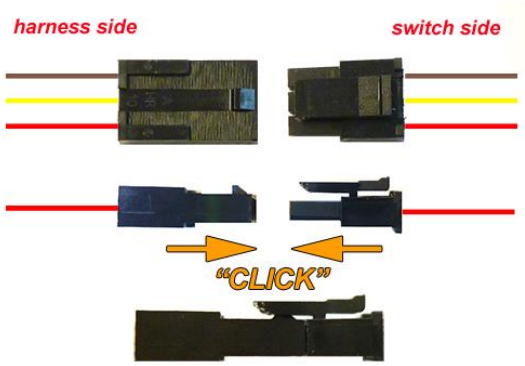
Electrical connections

Driver room

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



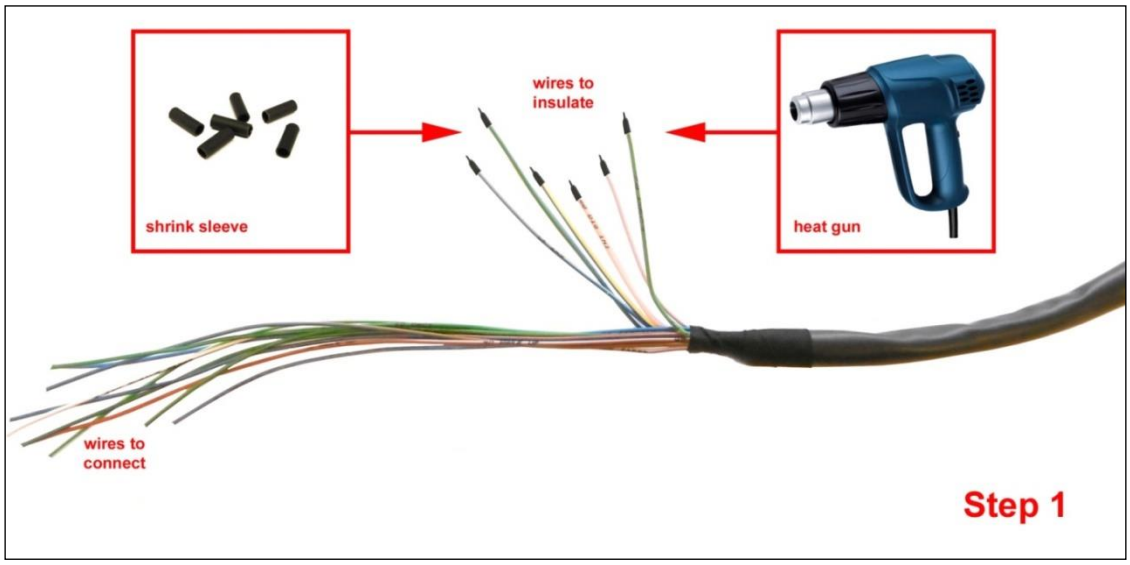
3-pole micro connector				*Connect to* the Prins fuel selection switch
66	Ground fuel switch		Brown-black	
3	+12V fuel switch		Red-white	
49	LIN fuel switch		Yellow	

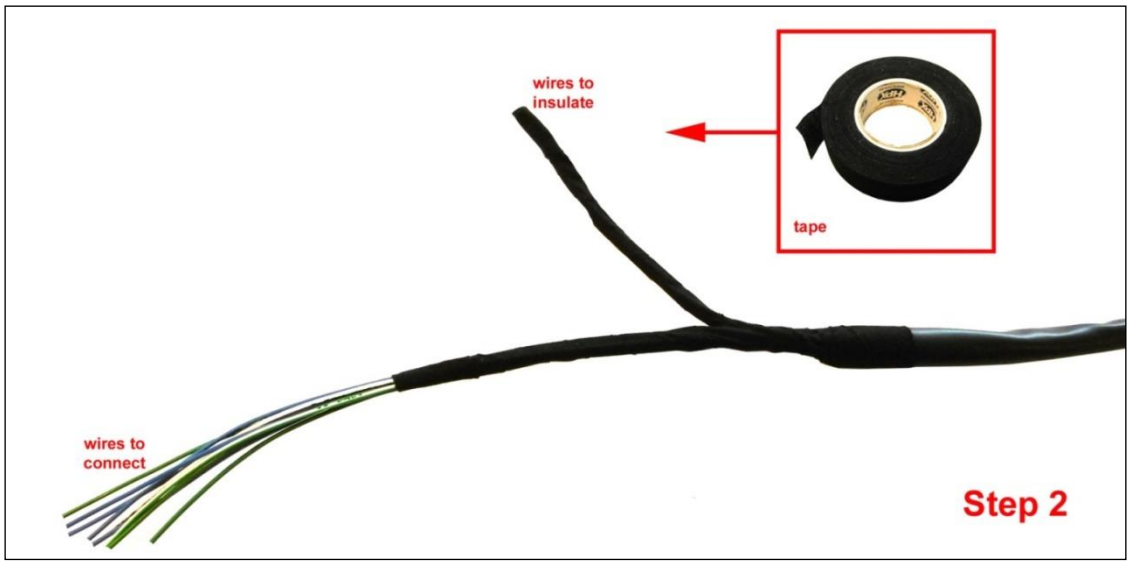


Universal Wiring - Electrical connections – Not used wires to insulate

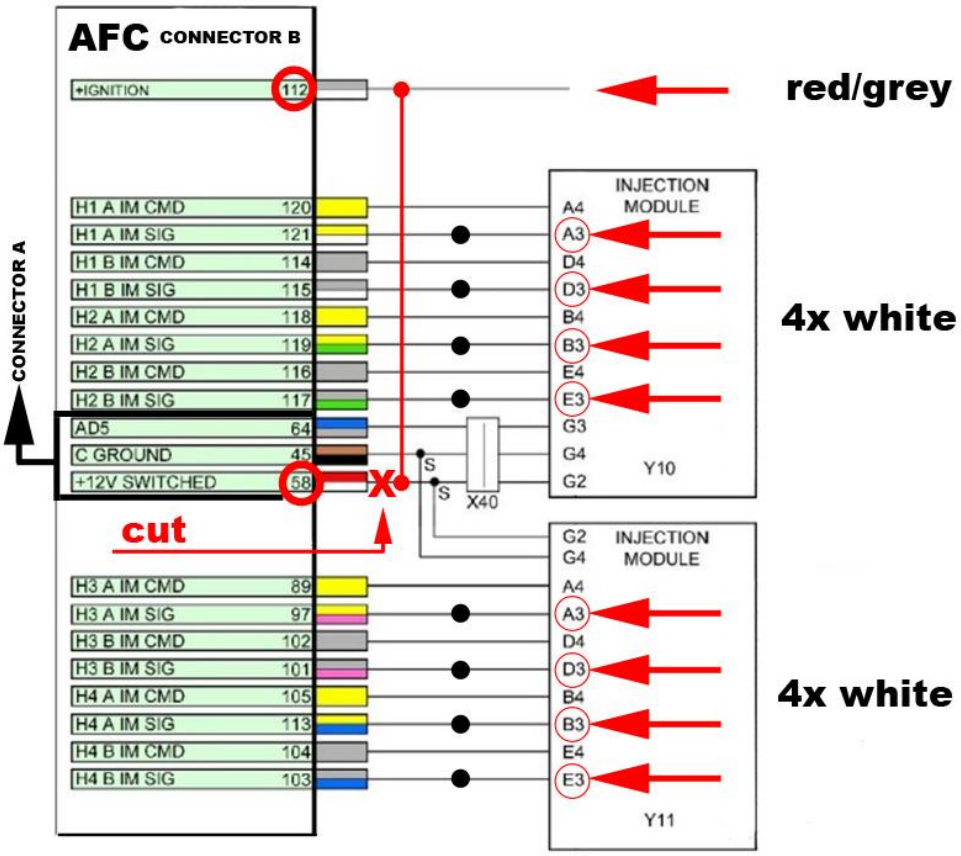
19	AD 4			Blue	
20	AD 3			Blue-pink	
22	LSS1			Purple	
23	LSS2			Purple-green	
25	DAC 1			Green-white	
36	AD 6			Blue-brown	
38	AD7			Blue-light Blue	
39	AD8			Blue-red	
43	+12 Valve 2			Red-white	
50	DAC4			Green-blue	
61	DIG IN4			Yellow-blue	
62	C Ground			Brown-black	
74	DAC3			Green-pink	
Insulate not used additional wires					

Electrical connections – How to insulate not used wires





Universal Wiring - Electrical connections - Ecotec Add-on Module(s)



Solder/connect the white wires to all **IM SIG** wires and the red/grey wire to the +ignition (112).
It is not important which white wire connects to what IM SIG wire. Be sure to insulate in a proper way.

Also cut **wire 58** near the AFC and insulate the wire to the AFC side. Connect the other side of wire 58 (from the injection modules) to +ignition (112) to supply the injection modules.

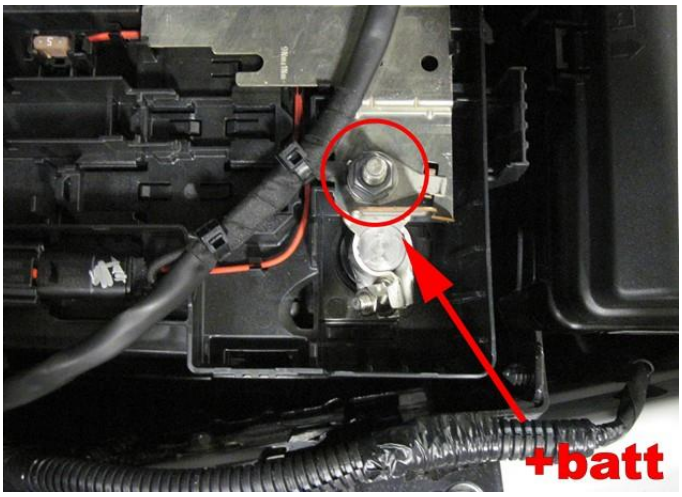
Mount the Add-on module(s) near the Injection modules.

Universal Wiring - Electrical connections

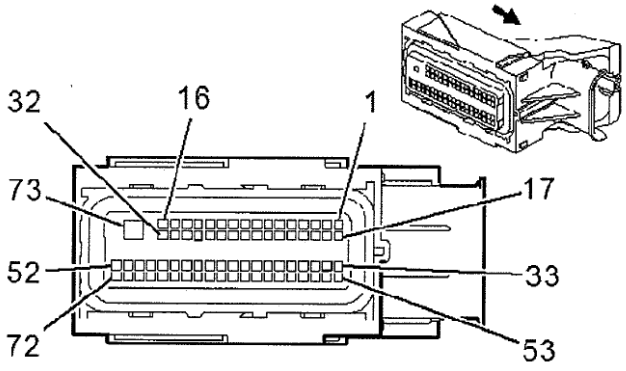
Check and measure the wiring in case of changes in the cars wiring colours.

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

4 +12V Battery	Red	*Connect to the '+' of the battery; use a ring terminal or solder:* Wire colour: **Red** Wire location: **+ Battery**



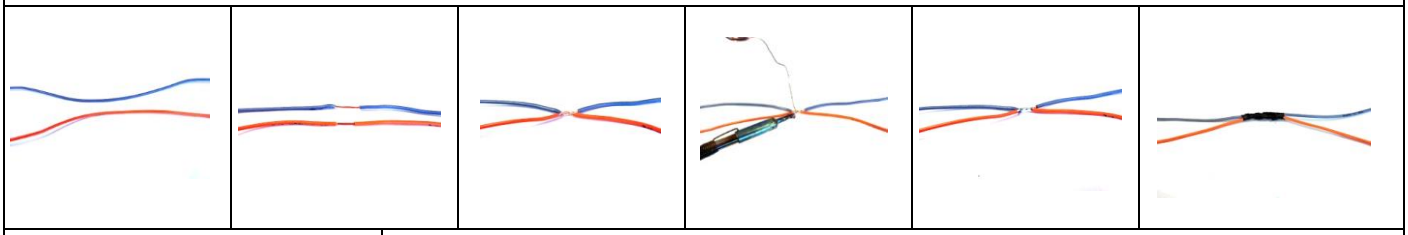
32 Ground sense 1 Ground battery	Brown	*Ground battery and ground sense.* Wire colour: **Black-white** Wire location: Petrol ECU - Grey Connector **X3** - pin **73**

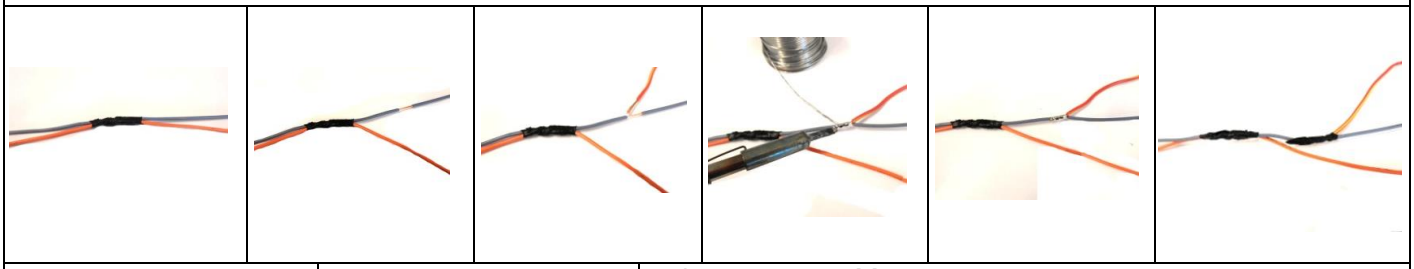


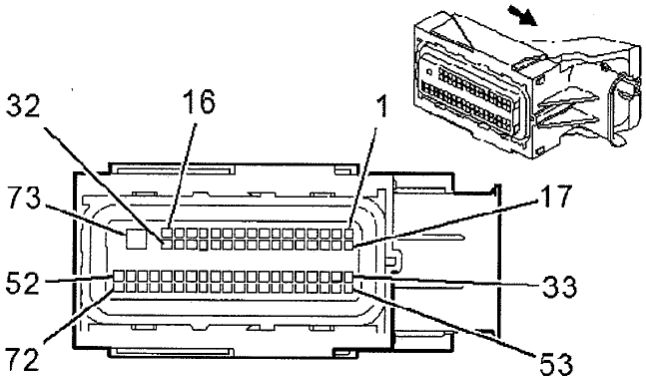
DO NOT CONNECT TO THE BATTERY GROUND !

Universal Wiring - Electrical connections

When mismatching colours : Pin numbers/positions are leading !

⚠ **Join the injector supply connections of the petrol injector groups**	
	
Join +inj.1 and +inj. 6	Grey Connector **X3** - pin **72** with pin **68**
Join +inj.2 and +inj. 3	Grey Connector **X3** - pin **69** with pin **65**
Join +inj.4 and +inj. 7	Grey Connector **X3** - pin **66** with pin **70**
Join +inj.5 and +inj. 8	Grey Connector **X3** - pin **67** with pin **71**

Connect AFC wiring to ECU High 1, 2, 3 & 4 (H1, H2, H3 & H4) to just joint wires		
		
Petrol inj. High 1 H1 (ECU HIGH 1)	Red-White	Colour: **Brown-white** Location: Petrol ECU, grey connector **X3**, inj. 1 - pin **72**
Petrol inj. High 2 H2 (ECU HIGH 2)	Red-Green	Colour: **Brown-green** Location: Petrol ECU, grey connector **X3**, inj. 2 - pin **69**
Petrol inj. High 3 H3 (ECU HIGH 3)	Red-Pink	Colour: **Blue-White** Location: Petrol ECU, grey connector **X3**, inj. 4 - pin **66**
Petrol inj. High 4 H4 (ECU HIGH 4)	Red-Blue	Colour: **Green-White** Location: Petrol ECU, grey connector **X3**, inj. 5 - pin **67**



Universal Wiring - Electrical connections

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

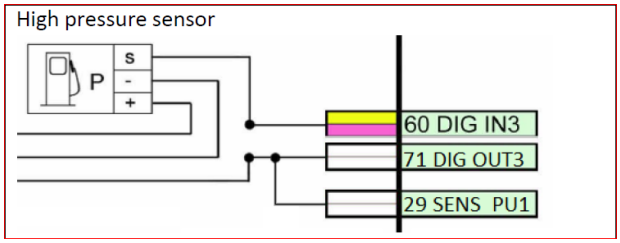
⚠ For measuring the petrol injectors :
Interrupt each petrol injector control wire (injector min)
Each VSI wire has a petrol injector / cylinder number printed on the wire, connect this wire to the corresponding petrol injector / cylinder.
Connect the **bicoloured** VSI measuring wire to the **ecu side**, (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.

VSI measure wire nr. :	Full coloured / Bicoloured	Interrupt petrol injector wire
H1 (INJ LO A)	**Yellow**	Injector side
H1 (ECU LO A)	**Yellow-white**	ECU side
IM pos. B2 / A2 - Petrol injector cyl. ***1***		Colour: **Brown** Location : Petrol ECU, **X3** , pin **52**
H1 (INJ LO B)	**Grey**	Injector side
H1 (ECU LO B)	**Grey-white**	ECU side
IM pos. D1 / D2 - Petrol injector cyl. ***6***		Colour: **Violet-green** Location : Petrol ECU, **X3** , pin **48**
H2 (INJ LO A)	**Yellow**	Injector side
H2 (ECU LO A)	**Yellow-green**	ECU side
IM pos. A1 / C2 - Petrol injector cyl. ***2***		Colour: **Dark blue** Location: Petrol ECU, **X3** , pin **49**
H2 (INJ LO B)	**Grey**	Injector side
H2 (ECU LO B)	**Grey-green**	ECU side
IM pos. E1 / F2 - Petrol injector cyl. ***3***		Colour: **Green** Location: Petrol ECU, **X3** , pin **45**
H3 (INJ LO A)	**Yellow**	Injector side
H3 (ECU LO A)	**Yellow-pink**	ECU side
IM pos. C1 / B1 - Petrol injector cyl. ***4***		Colour: **Grey-Blue** Location: Petrol ECU, **X3** , pin **46**
H3 (INJ LO B)	**Grey**	Injector side
H3 (ECU LO B)	**Grey-pink**	ECU side
IM pos. F1 / E2 - Petrol injector cyl. ***7***		Colour: **Yellow-grey** Location: Petrol ECU, **X3** , pin **50**
H4 (INJ LO A)	**Yellow**	Injector side
H4 (ECU LO A)	**Yellow-blue**	ECU side
IM pos. A1 / C2 - Petrol injector cyl. ***5***		Colour: **White-green** Location: Petrol ECU, **X3** , pin **47**
H4 (INJ LO B)	**Grey**	Injector side
H4 (ECU LO B)	**Grey-blue**	ECU side
IM pos. E1 / F2 - Petrol injector cyl. ***8***		Colour: **Grey** Location: Petrol ECU, **X3** , pin **51**

Universal Wiring - Electrical connections

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

X3:

60, 71 & 29			*Fuel rail pressure sensor signal interruption.* Wire colour: **Dark blue-White** Wire location: Petrol ECU, **X3**, pin **63** ***Add wiring module for pin 29 & pin 71***
60 DIG IN3		Yellow-pink	Sensor side
71 **Wiring module**		**White**	ECU side
29 **Wiring module**		**White**	Connect wire **29** to wire **71**, see picture below
			

3-pole connector 27 +5V Sensor 37 C ground 18 AD1		*Red-blue* *Brown-black* Blue-white	*For measuring the inlet manifold pressure (MAP).* *Cut off connector and insulate not used wire.* *Cut off connector and insulate not used wire.* Wire colour: **Light green-White** Wire location: Petrol ECU, **X3,** pin **58**
18 AD 1		Blue-white	

			For measuring the engine speed signal. Wire colour: **Yellow-Violet** Wire location: Petrol ECU, **X3,** pin **8**
8 RPM		Purple-white	

X2:

			High pressure petrol sensor ground. Wire colour: **Black-white or Black-yellow** Wire location: Petrol ECU, **X2,** pin **3**
63 Ground Shift		Blue-orange	

			High pressure petrol sensor supply 5V. Wire colour: **White-red** Wire location: Petrol ECU, **X2,** pin **39**
40 Wake-up		Grey-red	

X1:

112			*Make a connection to ignition + / contact +.* Do not place the fuse in the holder before having completed the installation of the LPG system. Wire colour: **Violet-Blue** Wire location: Petrol ECU, **X1,** pin **48**:
112 + Ignition		Red-grey	

Universal Wiring - Electrical connections – *With SINGLE petrol tank*

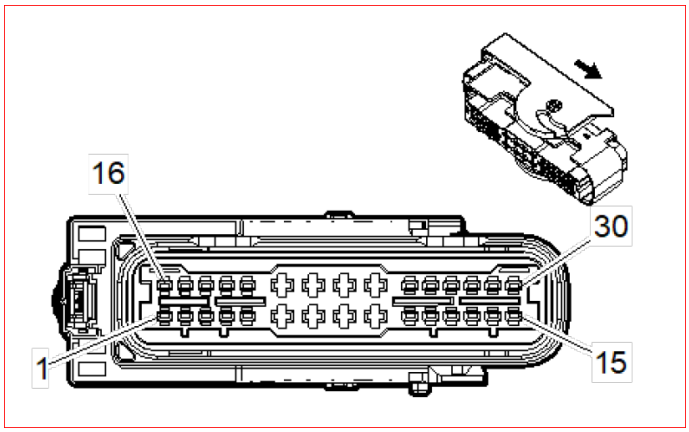
Extend wire 10 DAC2, 17 AD2 & 56 DI2 with the supplied 3-core wiring.

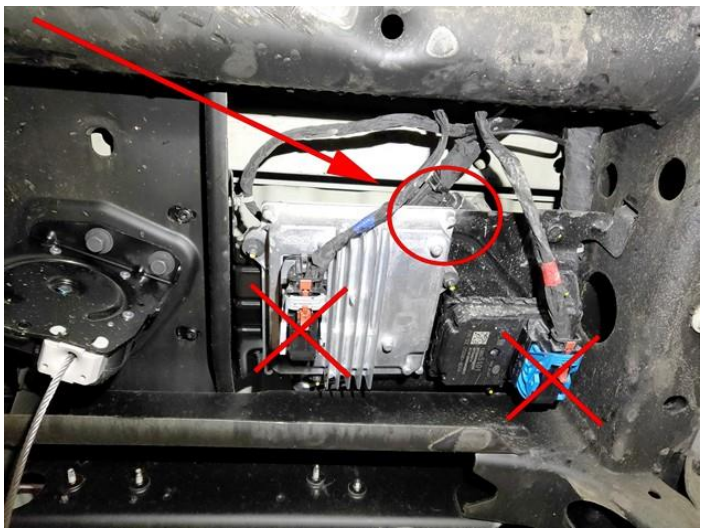
Wire	Original colour	To colour
10 DAC2	Green	Black
17 AD2	Blue-green	Blue
56 DI2	Yellow-green	Red

17 & 10			*Fuel line pressure sensor signal interruption.* Wire colour **Blue-White** Wire location: **Fuel Pump Driver Control Module**, pin **26**
17 AD2	Blue-green	*3-core Blue*	Sensor side
10 DAC2	Green	*3-core Black*	Chassis Control Module Side

56 DI2	Yellow-green	*3-core Red*	*Fuel pump supply voltage PWM.* Wire colour: **Grey** Wire location: **Fuel Pump Driver Control Module** Pin **8**

Location Fuel Pump Driver Control Module above spare wheel.





Universal Wiring - Electrical connections – *With DUAL petrol tank*

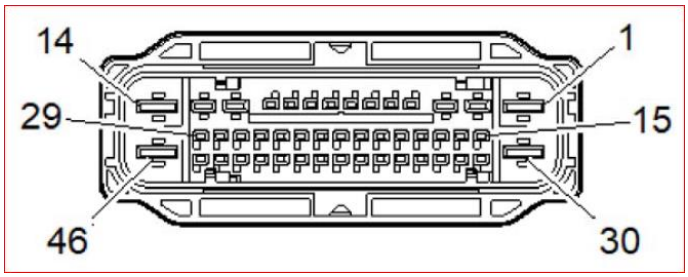
Extend wire 10 DAC2, 17 AD2 & 56 DI2 with the supplied 3-core wiring.

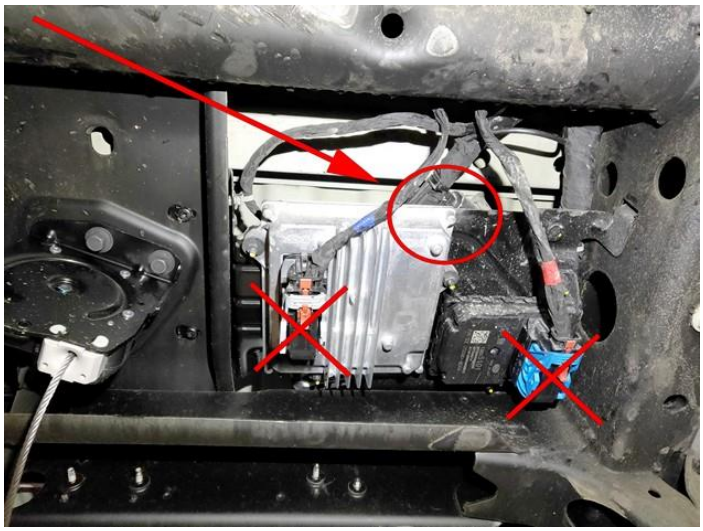
Wire	Original colour	To colour
10 DAC2	Green	Black
17 AD2	Blue-green	Blue
56 DI2	Yellow-green	Red

17 & 10			*Fuel line pressure sensor signal interruption.* Wire colour **Blue-White** Wire location: **Fuel Pump Driver Control Module**, pin **20**
17 AD2	Blue-green	*3-core Blue*	Sensor side
10 DAC2	Green	*3-core Black*	Chassis Control Module Side

56 DI2	Yellow-green	*3-core Red*	*Fuel pump supply voltage PWM.* Wire colour: **Grey** Wire location: **Fuel Pump Driver Control Module** Pin **2**

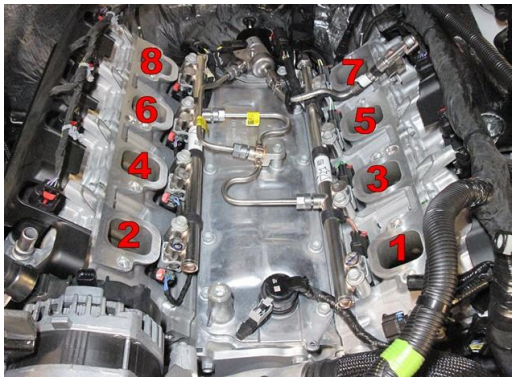
Location Fuel Pump Driver Control Module above spare wheel.





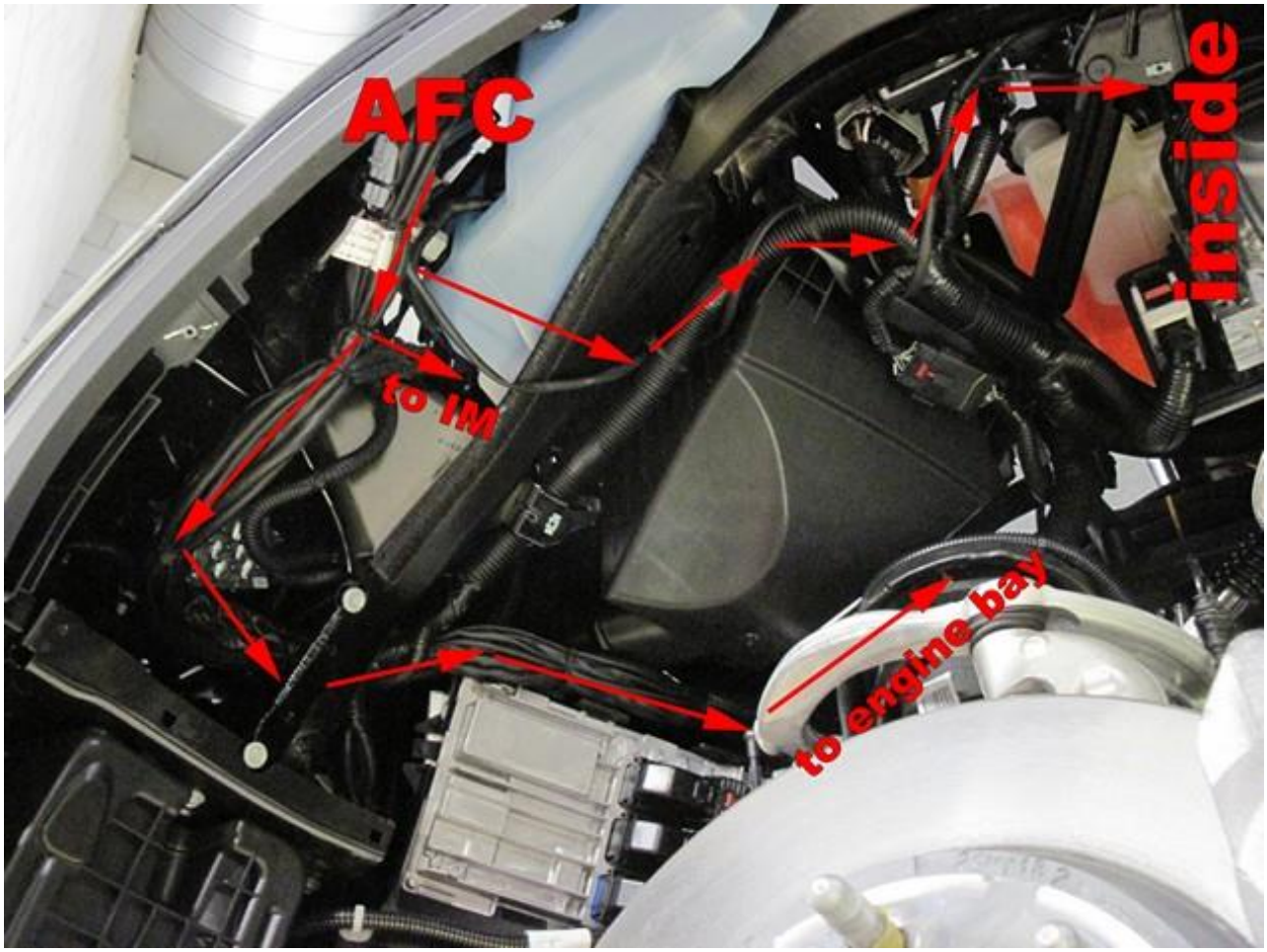
Universal Wiring - Electrical connections

Wire number / code	Wire colour	Connection
98 98 G INJ OUT **1**	**White-yellow**	Connector VSI-injector to cylinder **1**. (**front left 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**	
82 82 G INJ OUT **4**	**Blue-yellow**	Connector VSI-injector to cylinder **4**.
90 90 G + INJ 4	**red**	
83 83 G INJ OUT **5**	**Grey-yellow**	Connector VSI-injector to cylinder **5**.
91 91 G + INJ 5	**red**	
84 83 G INJ OUT **6**	**Brown-yellow**	Connector VSI-injector to cylinder **6**.
92 91 G + INJ 6	**red**	
85 85 G INJ OUT **7**	**LBlue-yellow**	Connector VSI-injector to cylinder **7**.
93 93 G + INJ 7	**red**	
86 86 G INJ OUT **8**	**Red-yellow**	Connector VSI-injector to cylinder **8**.
94 94 G + INJ 8	**red**	



front

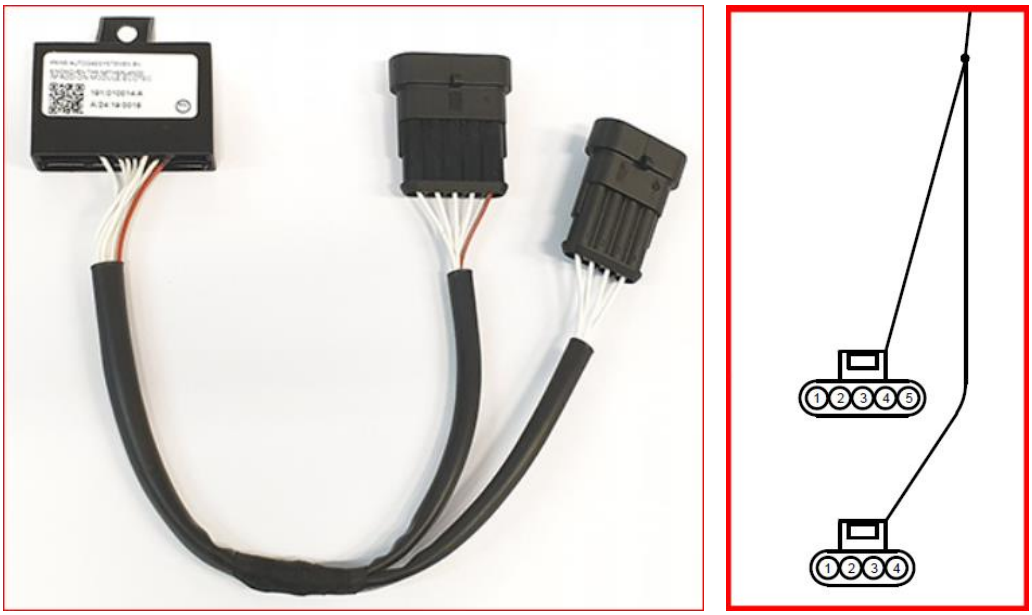
Dedicated Wiring - Wiring routing overview



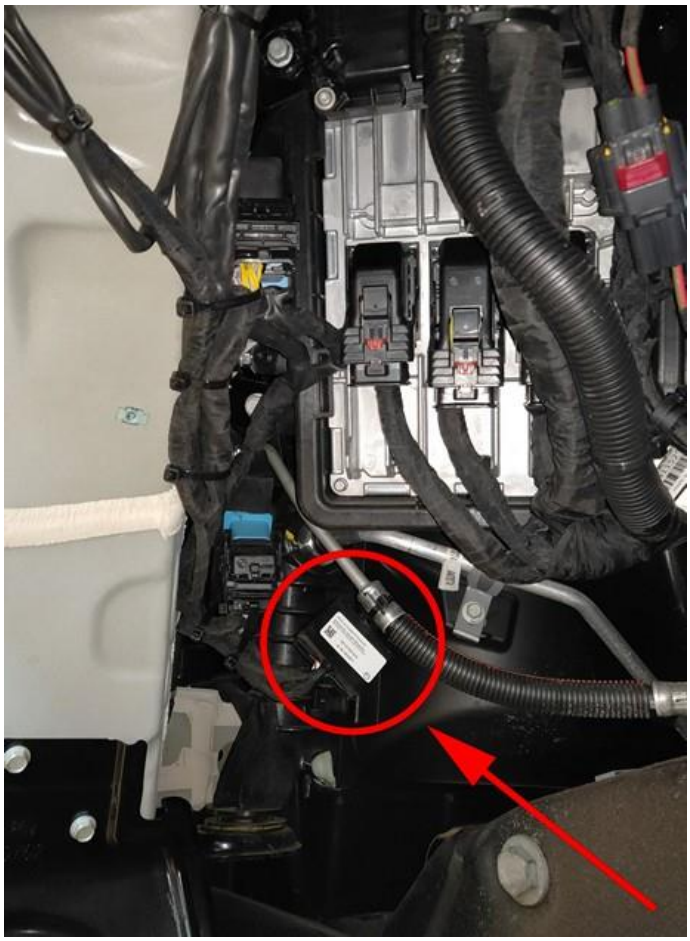
Routing overview from AFC

The following pages will show the connections in order of the wiring loom.

Dedicated Wiring - Electrical connections - Add-on Module & Injection modules



Mount the Add-on to the wiring loom



Mount the Add-on module near the Injection modules.

Dedicated Wiring - Electrical connections

32 Ground sense 1 Ground battery		Brown	*Ground battery and ground sense.* Wire colour: **Black** Location: To **original petrol ECU ground** on the left side of the engine. *Easy accessible from below.*

Mount the ring terminal to the original bolt from the ground point on the left side of the engine, easy accessible from below.

			For measuring the engine speed signal. Wire colour: **Yellow-Violet** Location: Next to the pulley from the crankshaft, easy accessible from below.
8 RPM		Purple-white	

Mount the connectors to the camshaft position sensor next to the pulley from the crankshaft, easy accessible from below.

Dedicated Wiring - Electrical connections

Connect the wiring loom to the petrol injector connectors before mounting the manifold!!

Mount the connectors to the petrol injector main connectors at the back side of the engine.
After this, mount the manifold back to the engine as shown in the manual.

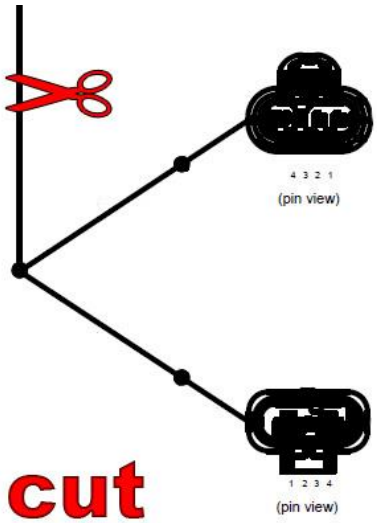
The following wires are also integrated in the petrol injector connectors, there is no need to connect something extra:

40 & 63				*Petrol fuel rail high pressure sensor.* Location: **In the petrol injector connectors**
40	Wake-up		Grey-red	*High pressure petrol sensor supply 5V.*
63	Ground Shift		Blue-orange	*High pressure petrol sensor ground.*

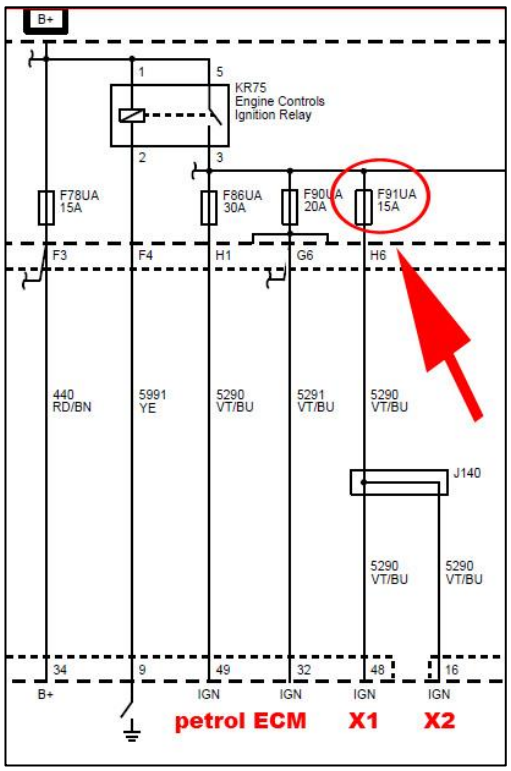
60, 71 & 29				*Petrol fuel rail high pressure sensor signal interruption.* Location: **In the petrol injector connectors**
60	DIG IN3		Yellow-pink	*High pressure petrol sensor signal sensor side*
71	Wiring module		White	*High pressure petrol sensor signal petrol ecu side*
29	Wiring module		White	*High pressure petrol sensor signal petrol ecu side*

Dedicated Wiring - Electrical connections

112			*Make a connection to ignition + / contact +.* Do not place the fuse in the holder before having completed the installation of the LPG system. Location: **To the wiring *BELOW* fuse 91** in the fuse box Colour: **Violet-blue**
112 + Ignition		Red-grey	



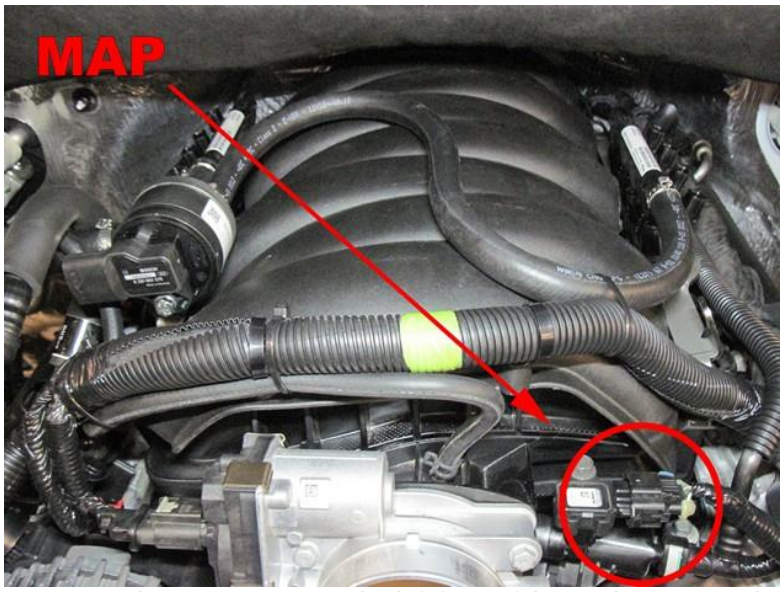
Cut off the connector and use wire **112** Red-grey.
Open the fuse box and connect the wire to the wire from **fuse 91**, Violet-blue.



Second option: Petrol ECM X1 - pin 48 - Violet-blue

Dedicated Wiring - Electrical connections

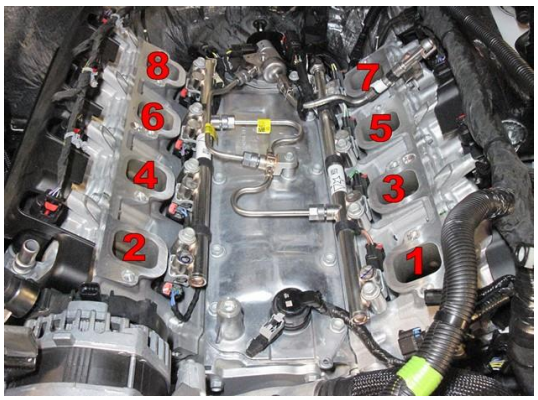
			For measuring the inlet manifold pressure (MAP). Wire colour: **Light green-White** Location: To the MAP sensor left front of the engine.
18	AD 1	Blue-white	



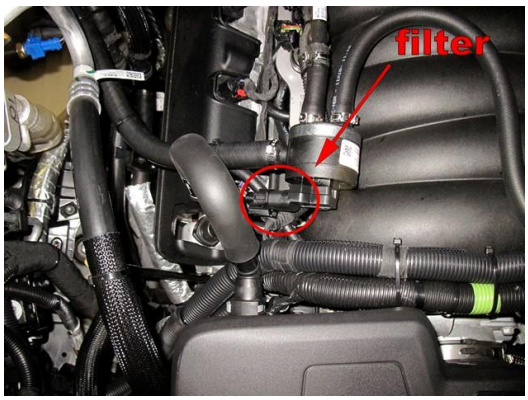
Mount the connectors to the MAP sensor at the left front of the engine, next to the throttle body.

Dedicated Wiring - Electrical connections

Wire number / code	Wire colour	Connection
98 98 G INJ OUT **1**	**White-yellow**	Connector VSI-injector to cylinder **1**. (**front left 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**	
82 82 G INJ OUT **4**	**Blue-yellow**	Connector VSI-injector to cylinder **4**.
90 90 G + INJ 4	**red**	
83 83 G INJ OUT **5**	**Grey-yellow**	Connector VSI-injector to cylinder **5**.
91 91 G + INJ 5	**red**	
84 83 G INJ OUT **6**	**Brown-yellow**	Connector VSI-injector to cylinder **6**.
92 91 G + INJ 6	**red**	
85 85 G INJ OUT **7**	**LBlue-yellow**	Connector VSI-injector to cylinder **7**.
93 93 G + INJ 7	**red**	
86 86 G INJ OUT **8**	**Red-yellow**	Connector VSI-injector to cylinder **8**.
94 94 G + INJ 8	**red**	



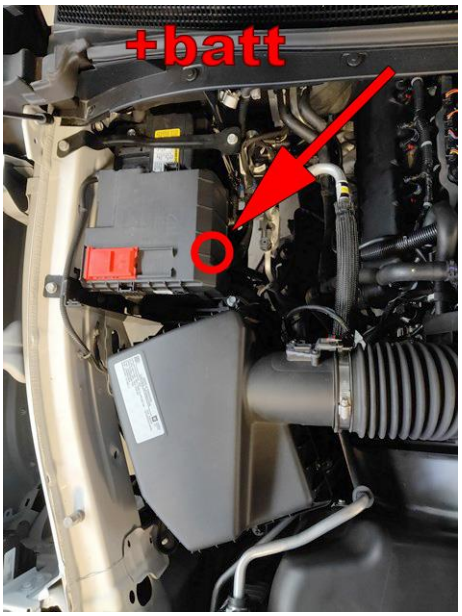
Front



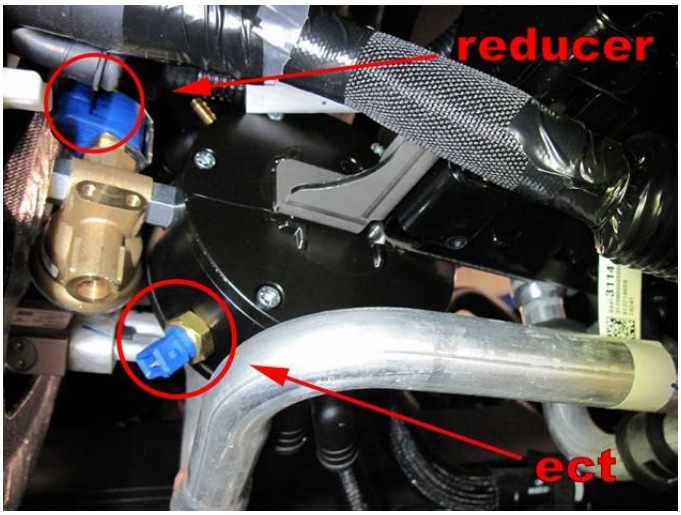
Filter connector

Dedicated Wiring - Electrical connections

4 +12V Battery		Red	*Connect to the '+' of the battery; use the ring terminal.* Wire colour: **Red** Wire location: **+ Battery**



Lift the battery cover to acces the mounting point.



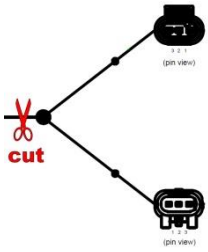
Mount the connectors to the ECT sensor & the reducer or eVP-500. Wiring routing to the tank, LPP & PWM. The wiring will be following the fuel line to/from the tank.

Dedicated Wiring - Electrical connections – *With SINGLE petrol tank*

Extend wire 10 DAC2, 17 AD2 & 56 DI2 with the supplied 3-core wiring.

Wire	Original colour	To colour
10 DAC2	Green	Black
17 AD2	Blue-green	Blue
56 DI2	Yellow-green	Red

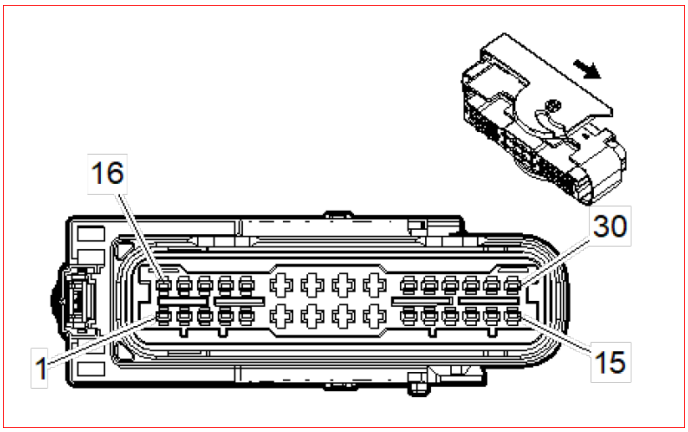
17 & 10			*Fuel line pressure sensor signal interruption.* Wire colour **Blue-White** Wire location: **Fuel Pump Driver Control Module**, pin **26**
17 AD2	Blue-green	*3-core Blue*	Sensor side
10 DAC2	Green	*3-core Black*	Chassis Control Module Side

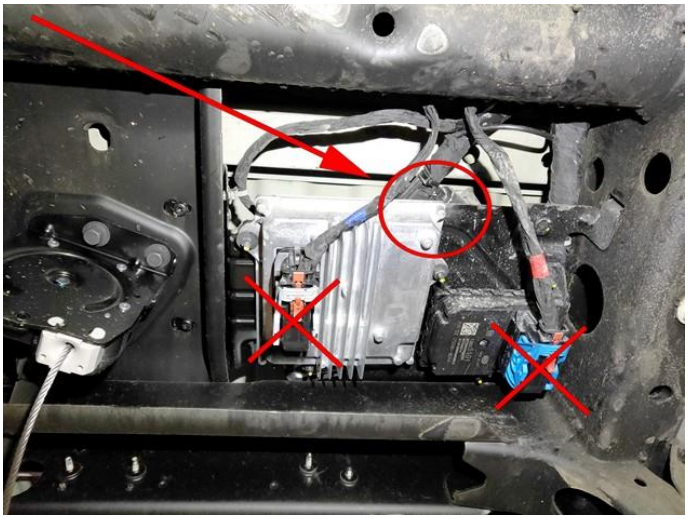


Cut off the connector with the 17 AD2 (Blue-green) and 10 DAC2 (Green) wire.

56 DI2	Yellow-green	*3-core Red*	*Fuel pump supply voltage PWM.* Wire colour: **Grey** Wire location: **Fuel Pump Driver Control Module** Pin **8**

Location Fuel Pump Driver Control Module above spare wheel.



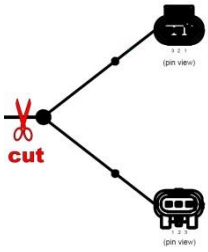


Dedicated Wiring - Electrical connections – *With DUAL petrol tank*

Extend wire 10 DAC2, 17 AD2 & 56 DI2 with the supplied 3-core wiring.

Wire	Original colour	To colour
10 DAC2	Green	Black
17 AD2	Blue-green	Blue
56 DI2	Yellow-green	Red

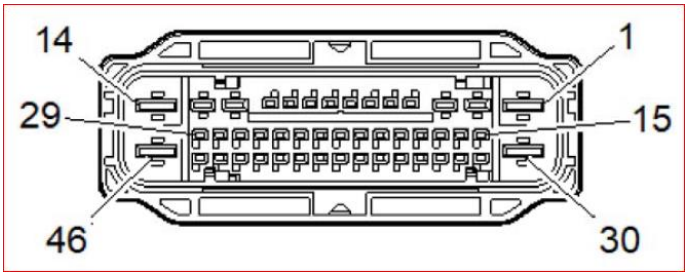
17 & 10			*Fuel line pressure sensor signal interruption.* Wire colour **Blue-White** Wire location: **Fuel Pump Driver Control Module**, pin **20**
17 AD2	Blue-green	*3-core Blue*	Sensor side
10 DAC2	Green	*3-core Black*	Chassis Control Module Side

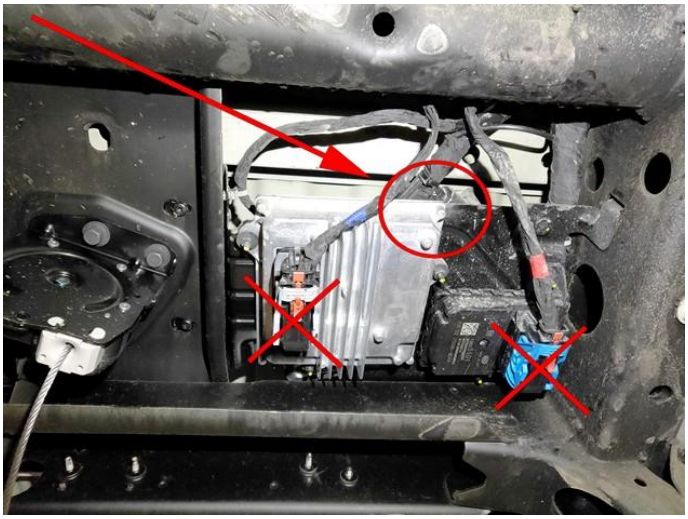


Cut off the connector with the 17 AD2 (Blue-green) and 10 DAC2 (Green) wire.

56 DI2	Yellow-green	*3-core Red*	*Fuel pump supply voltage PWM.* Wire colour: **Grey** Wire location: **Fuel Pump Driver Control Module** Pin **2**

Location Fuel Pump Driver Control Module above spare wheel.

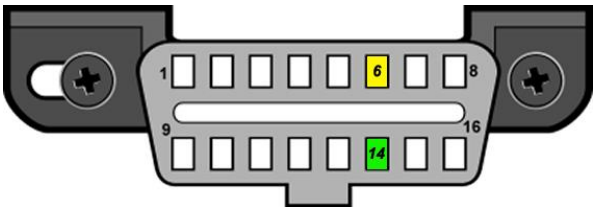




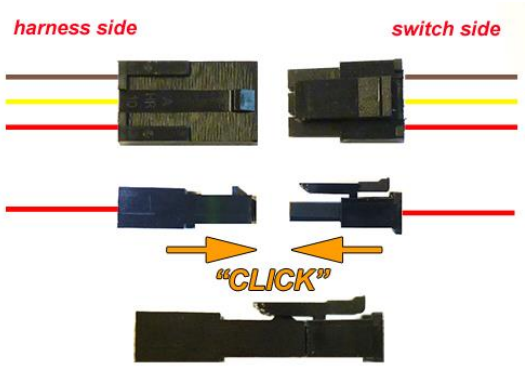
Dedicated Wiring - Electrical connections

Driver room

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

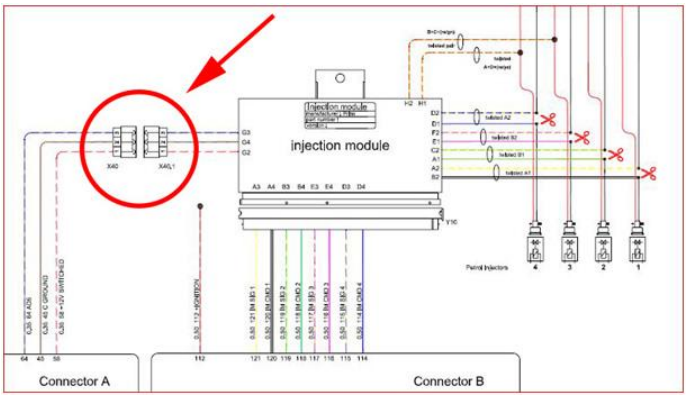


3-pole micro connector				*Connect to* the Prins fuel selection switch
66	Ground fuel switch		Brown-black	
3	+12V fuel switch		Red-white	
49	LIN fuel switch		Yellow	



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  (only universal wiring loom)

Optional:

3-pole connector 11 + manometer 12 tank level in 33 ground manometer	 Red Blue Brown	***Cut off connector and insulate wires*** (only on the original wiring loom)

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 evaporator 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 evaporator pressure.
   Refer to *Basic → System* in the diagnostic software for the idle level value set.
   Adjust the evaporator 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 evaporator 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.

ALTERNATIVE FUEL SYSTEMS
Prins