ALTERNATIVE FUEL SYSTEMS

Prins

Quality and innovation, it's in our nature

VSI LPG

Vapour Sequential Injection©

VSI CNG

Vapour Sequential Injection©

Installation manual

General

PART 1/2

DATE : 02-2021

VERSION NR : E

Table of contents

Contents

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 (10Nm)
- Portable light
- Assortment drill bits 4 to 12 mm
- Assortment cutters (ø 20, 30, 50, 70 mm)
- Punching tool ø 70 mm
- Round file
- Portable drill or pneumatic drill
- Threading device (male M6x1, M8x1, M10x1)
- Pipe-flaring tool (for 6 and 8 mm copper pipe)
- Air gun
- Vacuum cleaner
- Hot air gun
- Allan spanner for inlet couplings 3,5mm (part nr. 099//9970)
- Reducer adjustment tool (part nr. 099/9960)
- Molex extraction tool for VSI switch connector (part nr. 090/9929)
- 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 analyser)
- Check the condition of the ignition system (spark plugs, cables, coil)

General instructions

- The installation of the system shall be done in accordance with the installation manual provided by Prins Autogassystemen.
- Always disconnect the battery when installing the LPG/CNG 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 loom is not model specific, therefore is it may be necessary to adjust the length of the wires.
  Ensure maximum care is taken when connecting wiring.
  Make professional joints using solder and shrink sleeve. Do not stretch the wiring harness.
- No component of the LPG/CNG-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/CNG hose. (This guarantees the maximum flow through the hose without pollution.)
- If holes have to be drilled (wear safety glasses) in order to facilitate mounting the device frame, the reservoir frame, the LPG/CNG cut-off valve, etc., the drilled holes must always be treated with an anti-corrosive, after the burrs have been removed (especially when mounting a exterior filler).
- After having completed the installation, check the whole system for gas leakage; use a gas leak detection device.
- Fitting and maintenance is only allowed by Prins Autogassystemen selected LPG/CNG engineers.
- 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 updates, info-bulletins and product information. (www.prinsautogassytemen.com)
- For installing a dedicated VSI-system download *DEDICATED MANUAL (part 2/2)*

Please fill in the warranty card completely and return it within 8 days after installation.

Tightening moments / Symbols

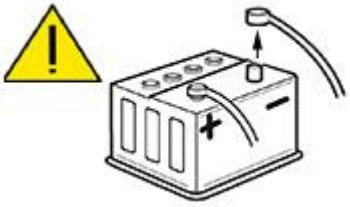
		Nm	Spanner mm
M5 x 0,8		6.5	8
M6 x 1,0		11.3	10
M8 x 1,25		27.3	13
M10 x 1		52	15-16-17
M10 x 1,5		54	15-16-17

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
Parker 4.8mm		6 max	
Parker 5.5mm		10 max	

EXPLANATION OF SYMBOLS:

= IMPORTANT, CAUTION

= WEAR SAFETY GOGGLES



R115 sticker

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

Introduction

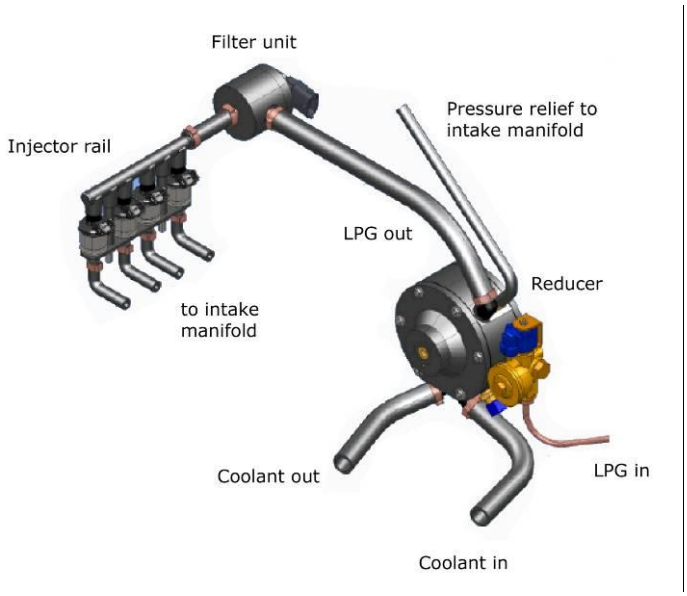
VSI stands for "*vapour sequential injection*", it points directly to the most important properties of the system. This second-generation gas injection system is based on a vapour LPG/CNG injection that is injected sequentially in the engine. Sequential means that the gas injectors will inject the LPG/CNG in the sequence equal to the injection sequence of the petrol injectors,
This sequence in most applications is equal to the firing order of the ignition sequence of the engine, for example with a 4-cylinder engine this is normally 1-3-4-2. Sequential injection means that the amount of injected fuel per cylinder the can be metered and timed individually.

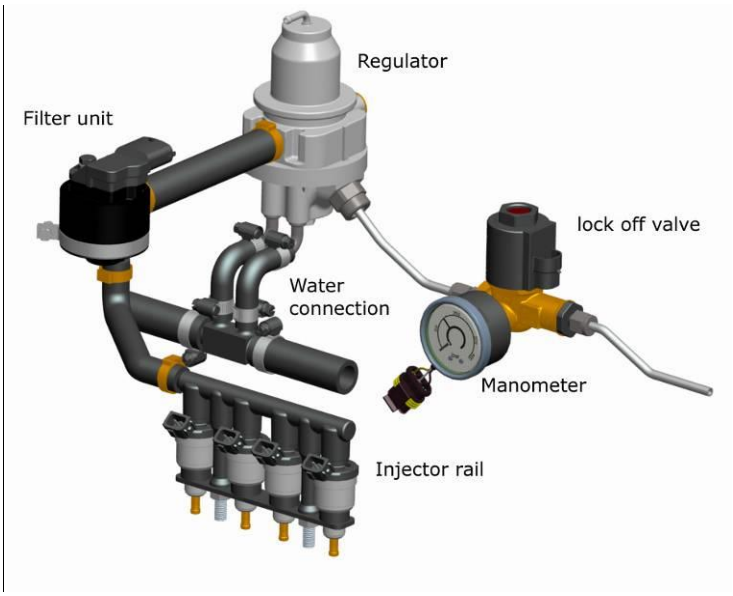
This achieves a much higher level of performance emission and drivability. The VSI system was designed and developed in-house by Prins Autogassystemen B.V.

VSI characterizes itself with a high level of integration into to the petrol management system. The two systems integrate as "master-slave" system.
This means that the original petrol management ECM controls the amount of LPG/CNG injected via the gas injectors into the engine. The VSI ECM only translates the relevant signals coming from the engine management system necessary for MASTER /SLAVE strategy.
Following this strategy the petrol management system is the "MASTER" and the VSI ECM the "SLAVE".
The advantage of this strategy: while driving on LPG/CNG the lambda control and OBD functions keep within the OE parameters, functioning correctly and controlled by the petrol management system. So when operating on LPG/CNG it is not necessary to generate simulated signals.

There is one exception made for the petrol injector signals, while driving on LPG/CNG the petrol injector's are switched off to discontinue the petrol supply. To maintain the injection control signals it is necessary to simulate the petrol injectors to ensure the original ECM does not detect a fault code. Secondly when operating on LPG/CNG it is necessary to maintain a petrol injector control signal to measure the required fuel demand.

The second generation injection system VSI has the ability to inject sequentially making it quicker and more accurate, large benefits can be gained in engine and emission performance.

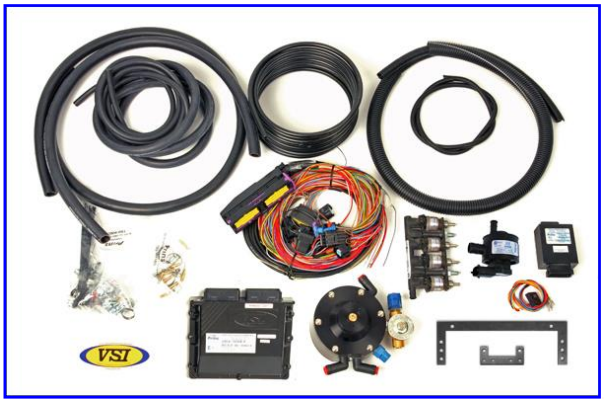




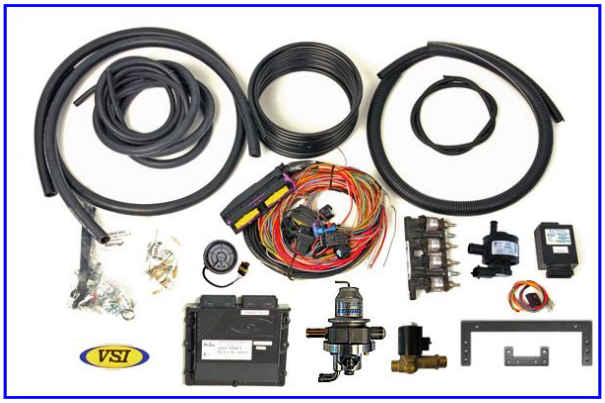
Approval numbers VSI LPG / CNG components

Mark	Component	LPG	CNG
Prins	VSI Reducer	E4-67R-010054	
Valtec	6 / 8mm lock-off valve	E4-67R-010041	
Keihin	Regulator		E4-110R-000092
Ventrex	Regulator		E1-110R02-00-0370
OMB	lock-off valve		E4-110R-000095
Wika	CNG Pressure indicator		E4-110R-000190
Prins	VSI Injector rail	E4-67R-010093	E4-110R-000021
Keihin	VSI Injector	E4-67R-010092	E4-110R-000020
Prins	Filter unit	E4-67R-010096	E4-110R-000028
Keihin	Filter unit	E4-67R-010177	E4-110R-000091
Prins	ECU	E4-67R-010098	E4-110R-000083
Electrical VSI components		EMC : E4-10R-020507	

VSI-I LPG



VSI-1 CNG



VSI-2.0 LPG Prins VSI Reducer

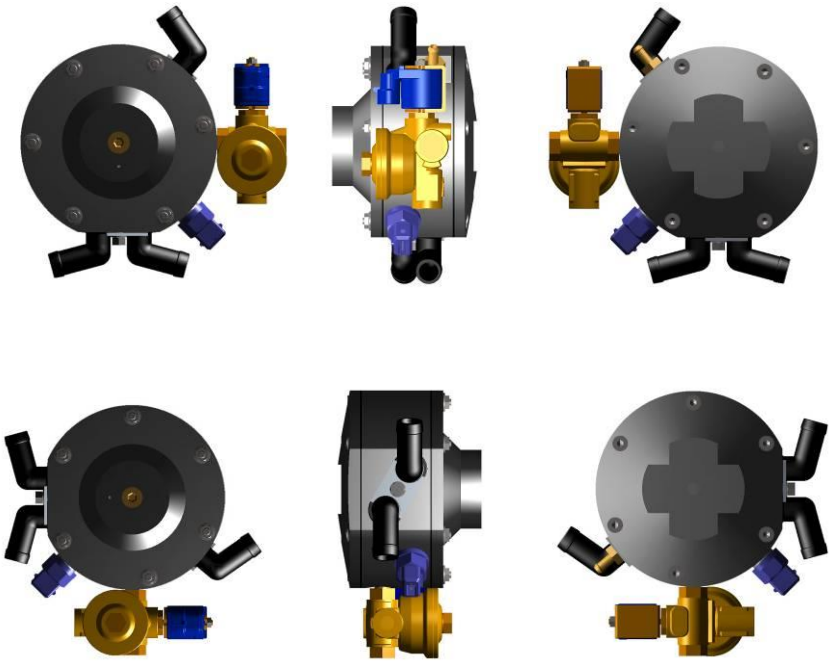
VSI-2.0 Prins eVP-500 Reducer

VSI-2-0 CNG Keihin

VSI-2-0 CNG Ventrex

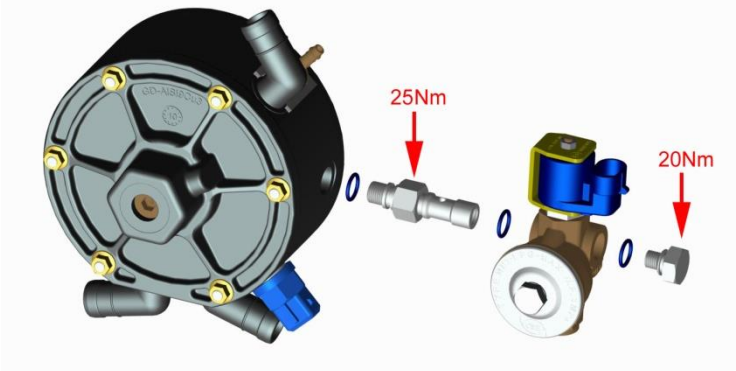
Prins VSI LPG reducer

- Mount the reducer to the body of the vehicle in the engine compartment, never on the engine!
- Mount the reducer so that it is easy to adjust the pressure.
- Install the supplied 8 mm threaded end in the back cover of the reducer.
- Mount the reducer as shown in the drawing.
- Mount the reducer on a bracket and bolt on with a M8x1 nut.
- The LPG lock-off valve can be installed in different positions. Do not damage the O-rings when rotating the lock-off valve. See picture for torque moment.
- The reducer is connected to the heating system circuit by couplings between the coolant fluid hoses: dependant on the converted vehicle the reducer is placed in series or in parallel with the heating system.
- Overpressure 5mm relief hose : connect to the intake manifold.
- 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.
- The pressure can be adjusted with the adjusting screw (Allan screw) in the front cover.
- Seal the adjusting screw, with the sticker, in the front cover of the reducer after adjusting the pressure.



mounting positions

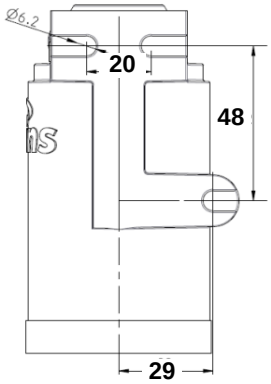
Standard reducer, 6 mm LPG pipe, used for engines with a HP <u>up to</u> 135 kW (180 HP).
High Output reducer, 8 mm LPG pipe, used for engines with a HP <u>over</u> 135 kW (180 HP).
Use a High Output MAP reducer on blown engines (turbo / compressor)



NO threat locking compound allowed !!

Prins eVP-500 LPG reducer

Mount the eVP-500 in the engine compartment as seen on the images below and according to local regulations. Always use the two upper mounting points. Use the third mounting point if the reducer suffers from vibration. Use the M6 bolts, nuts and spring lock washers delivered in the kit.



10Nm Do not Exceed torque, this may cause damage

Use spring lock washer

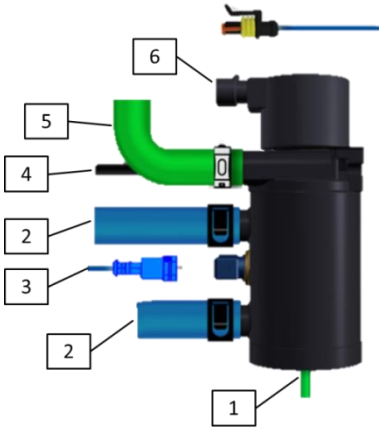
Design your own bracket according the dimensions or order a bracket separately.

Basic strip eVP: 001/999040

Bracket universal zinc plated steel: 001/080131

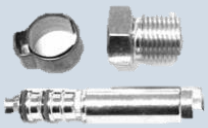
Wiring and hoses

1) LPG in
   a. …/B → M12x1 (XD4, XD5 flare straight / flare 90º)
   b. …./A: Standard M10x1
2) Coolant pipes
   - 16mm hose connection
   - No flow direction specified
3) ECT sensor (Engine Coolant Temperature)
   - Standard Prins sensor
   - NTC resistor
   - R20˚C ≈ 2500Ω
   - IP 54A Connector
4) Pressure Relief Valve (PRV)
   - Connect to inlet manifold or air intake
5) Gas Out to filter unit
   - 16 mm hose connection
6) Actuator connector
   - Regular Prins two pole Superseal connector



eVP variants

- **Part number: 180/030001**

Revision	/A	/B	/C
Solenoid	 O-ring at the bottom		 O-ring above the thread
Filter	 Type 1		 Type 2
Gas inlet	M10x1	M12x1	
Fitting hose LPG inlet		 Fitting Screw Flare M12x1 straight Standard	 Fitting Screw Flare M12x1 90° XD4: 081/350114/A XD5: 081/350115/A

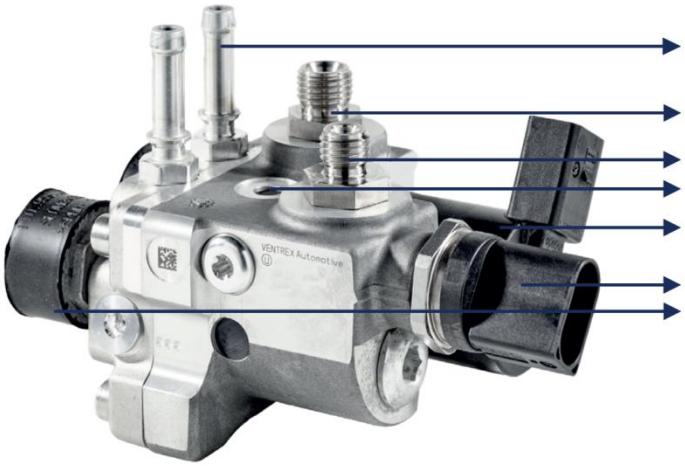
Please download our eVP-500 manual for:

- Product Information
- Product variants
- Installation Instructions
- Programming & Calibration
- Service & Maintenance
- Frequently Asked Questions

Keihin CNG regulator

- Mount the Keihin regulator to the body of the vehicle in the engine compartment, never on the engine!
- Mount the regulator so that it is easy to replace the inlet filter.
- Mount the regulator as shown in the drawing with the water connections downwards.
- Mount the regulator on a bracket and bolt on with 3 M6x1 nuts.
- The regulator is connected to the heating system circuit by couplings between the coolant fluid hoses.
- Optional MAP connection: connect to the intake manifold if needed.
- No component of the CNG-system shall be located within 100 mm of the exhaust or similar heat source, unless such components are adequately shielded against heat.
- The pressure may not be adjusted and is fixed on 3.3 bar

Ventrex Evo3.1 Electronic CNG Pressure Regulato



The Ventrex Evolution 3.1 is a state of the art full electronic reducer for the CNG market.
It is designed for the usage in the supply system of CNG powered engines. The mechanic stage and the electronic proportional valve ensure the regulation of the working pressure. At the same time, the proportional valve acts as a shut-off valve.

The EPR contains two stages: a mechanical first stage and an electro-magnetic second stage (proportional valve). Additionally, a heat exchanger is part of the pressure regulator.
The proportional valve is controlled by a PWM signal (defined voltages), external from AFC.
The shut-off function is integrated in the electro-magnetic pressure regulation unit (proportional valve) as it is “normally closed”.

The system pressure is managed by the calibration settings. The gas system pressure can be set by different strategies

1) Constant pressure
2) Pressure related to the inlet manifold (Delta pressure)
3) Related to engine load / speed
4) Combination of delta pressure and engine speed / load

The target pressure can be read out with the Prins AFC Software v2.

When the system pressure is related to the inlet manifold, the electronic MAP signal is used to manage the system pressure. The hose connection to the inlet manifold is used for the Pressure Relief Valve. No extra connection to the inlet manifold is needed to manage a Delta pressure.

Mount the CNG Pressure Regulator:

- In the engine compartment as described in the (semi-) dedicated installation instructions.
- According to local regulations.
- With the delivered bracket.
- With use of the two rubber dampers.
- With use of the M6 bolts, nuts and spring lock washers delivered in the kit.
- No component of the CNG-system shall be located within 100 mm of the exhaust or similar heat source, unless such components are adequately shielded against heat.

The injector rail

VSI 4-cylinder injector rail [KN8/KN9]

The Prins injector rail is available in 2 - 3 - 4 - 5 rail versions.

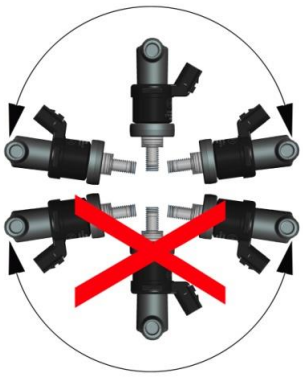
Table guideline for universal VSI injector choice:
Divide total engine power (kW) up into the amount of cylinders.

LPG:

Max. flow (cc/st)	32	42	52	63	73	82	100
KN-8 ID (color)	Green	White	Blue	Orange	Yellow	-	Brown
KN-9 ID.	32	42	52	63	73	82	-
Grooves	0	1	2	3	4	5	5
Min Pk / cil (LPG)	-	13	18	25	34	38	42
Max Pk / cil (LPG)	18	21	27	37	50	53	60
Min kW / cil (LPG)	-	9	13	18	25	28	31
Max kW / cil (LPG)	13	15	20	27	35	40	45

CNG:

Color	Efficiency	Min. power per cylinder [CNG]		Max. power per cylinder [CNG]	
		kW	HP	kW	HP
Green				13.3	18.0
White	42cc/stroke	7.2	9.7	12.0	16.1
Blue	52cc/stroke	10.4	13.9	16.0	21.5
Orange	63cc/stroke	14.4	19.3	21.6	29.0
Yellow	73cc/stroke	20.0	26.8	28.0	37.5
Brown	100cc/stroke	24.8	33.3	36.0	48.3



Prins filter unit

The filter unit filters the vaporized LPG/CNG to protect the gas injectors against pollution. The integrated P/T sensor measures the actual gas temperature (T_gas) and gas pressure (Psys). There are two filter unit versions: a single outlet and a double outlet variant.
Single outlet : on converted vehicle with 3-4 or 5 cylinder engines with one single VSI injector rail.
Double outlet : on converted vehicle with 6 or 8 cylinder engines with two VSI injector rails.

Single outlet
3-4-5 cylinder engine

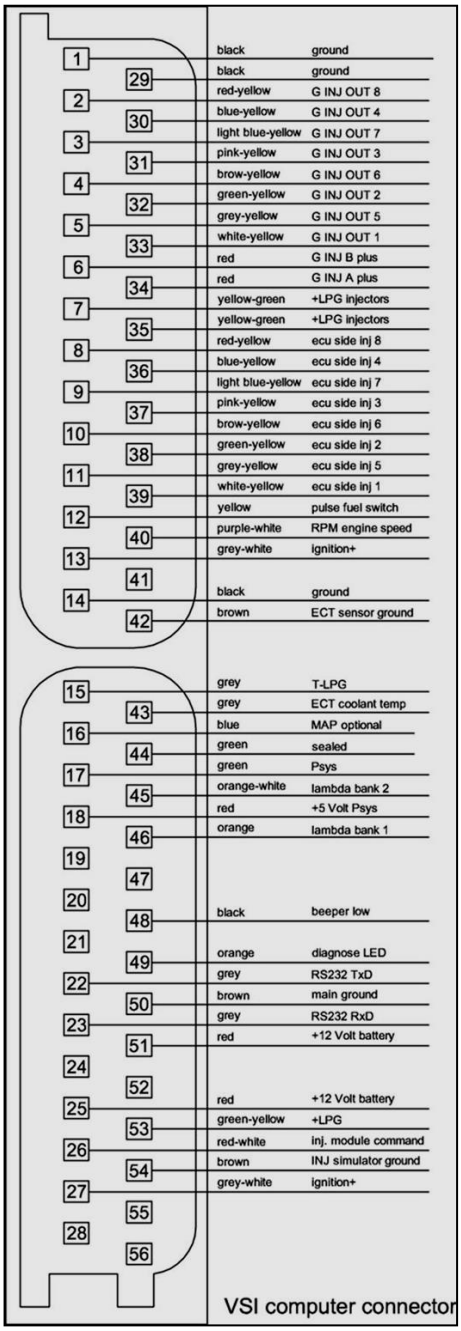
Double outlet
6-8 cylinder engine

Keihin filter unit

VSI computer

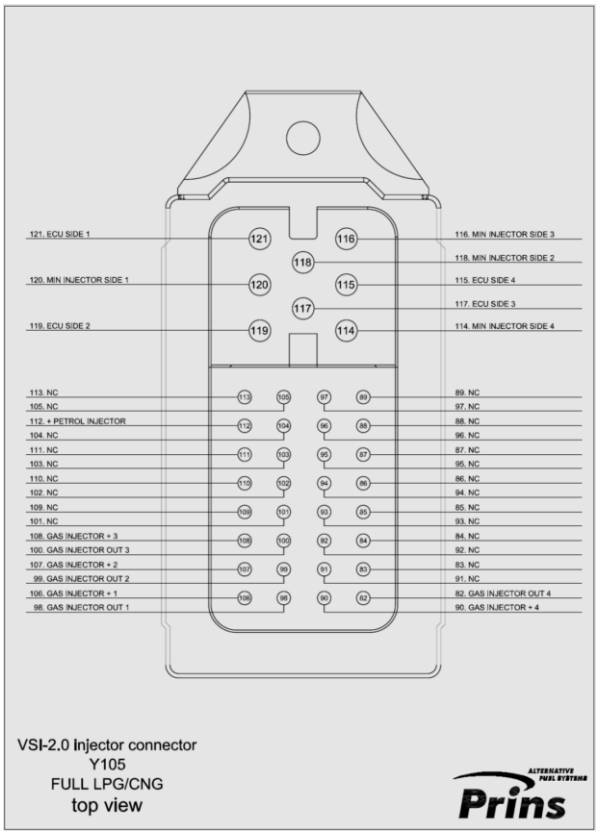
The VSI computer can be mounted into the engine room as well as inside the car, depending on the converted vehicle.
Never mount the computer near a heat source.
Never mount the computer upside down.
Never clean engine room with a high pressure cleaner.

VSI-I



AFC-2.x computer

The Prins AFC-2 computer is the second generation master-slave management system. This new design has distinctive features and will be used as a new platform for current and future Prins injection systems.



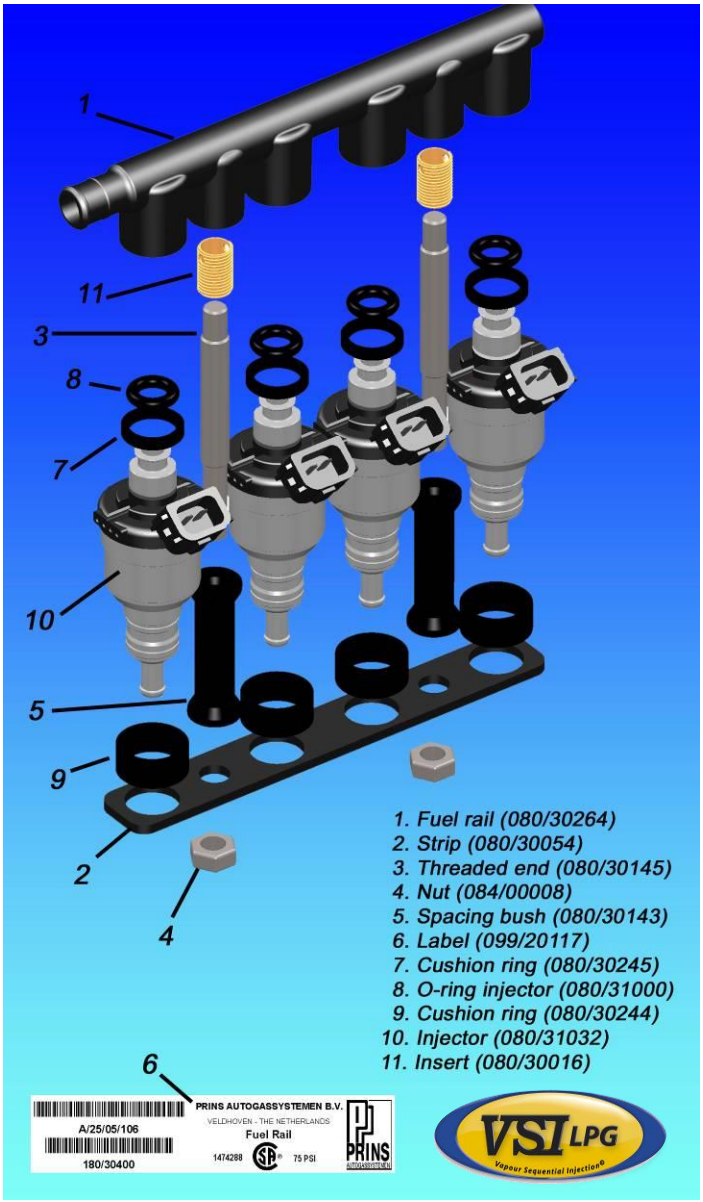
Instructions rotating the Prins VSI injector rail

This instruction shows how to convert a “right” rail into a “left” injector rail inlet

Tools : Ring spanner size 13 mm
Torque spanner (0-3 Nm)

Disassembly / assembly:

Unscrew both M8 (4) nuts.
Remove the strip (2).
Remove the injectors (10) with a rotating movement out of the fuel rail (1).
Rotate the rail (1) 180 degrees.
Mount the injectors (10) with a rotating movement into the fuel rail (1).
Mount the strip (2) on the injectors (10).
Tighten the strip (2) with two M8 nuts (4). Tightening moment **2.5 Nm**.



Wiring looms

The cables in the loom are provided with numbers and text. The text on the cable explains the function of the wire. The wire loom is not model specific, therefore is it may be necessary to adjust the length of the wires.

The watertight ECM housing is made from aluminium; this material is chosen for its excellent heat dissipation qualities, necessary for cool the injector drivers.
Always fix the computer in the coolest place in the engine compartment.

All cable numbers correspond with a position numbered on the connector.
Example wire number 4 is mounted on connector position 4.

Ensure maximum care is taken when connecting wiring.
Make professional solder joints and insulate the joints.
Do not stretch the wiring harness.

VSI-I

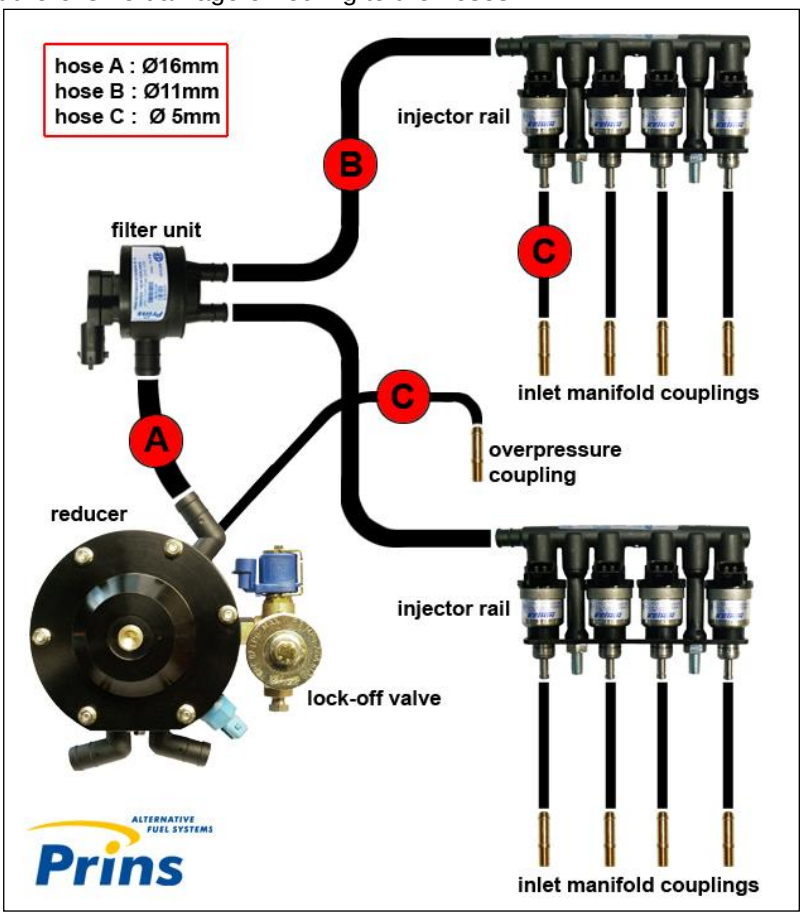
The wiring harness is equipped with a 56 position interlocking connector which slots into the VSI computer. Pull the purple interlocking clip and push the connector into the VSI computer, push the clip back into its original position, the connector is now locked into the VSI computer.

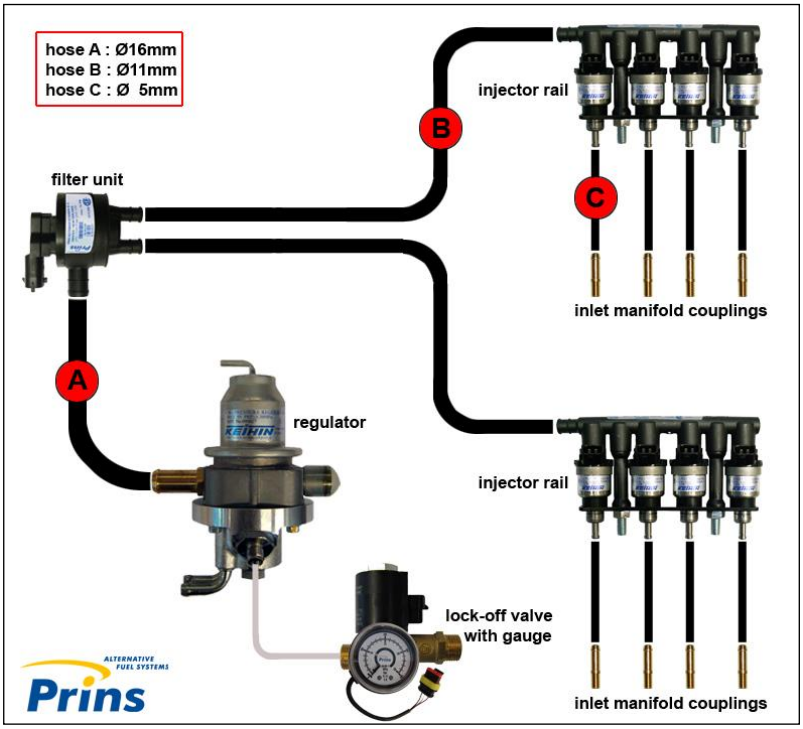
VSI-2.0

The wiring harness connects to the computer via two Bosch 81+40 pins connectors which is locked to the Alternative Fuel Controler by means of connector clamping mechanism.

Hose connections

Try to keep the inlet manifold hoses as short as possible.
Use a hose clamp on all the LPG/CNG hose connections.
Please observe that there is no damage or fouling to the hoses.





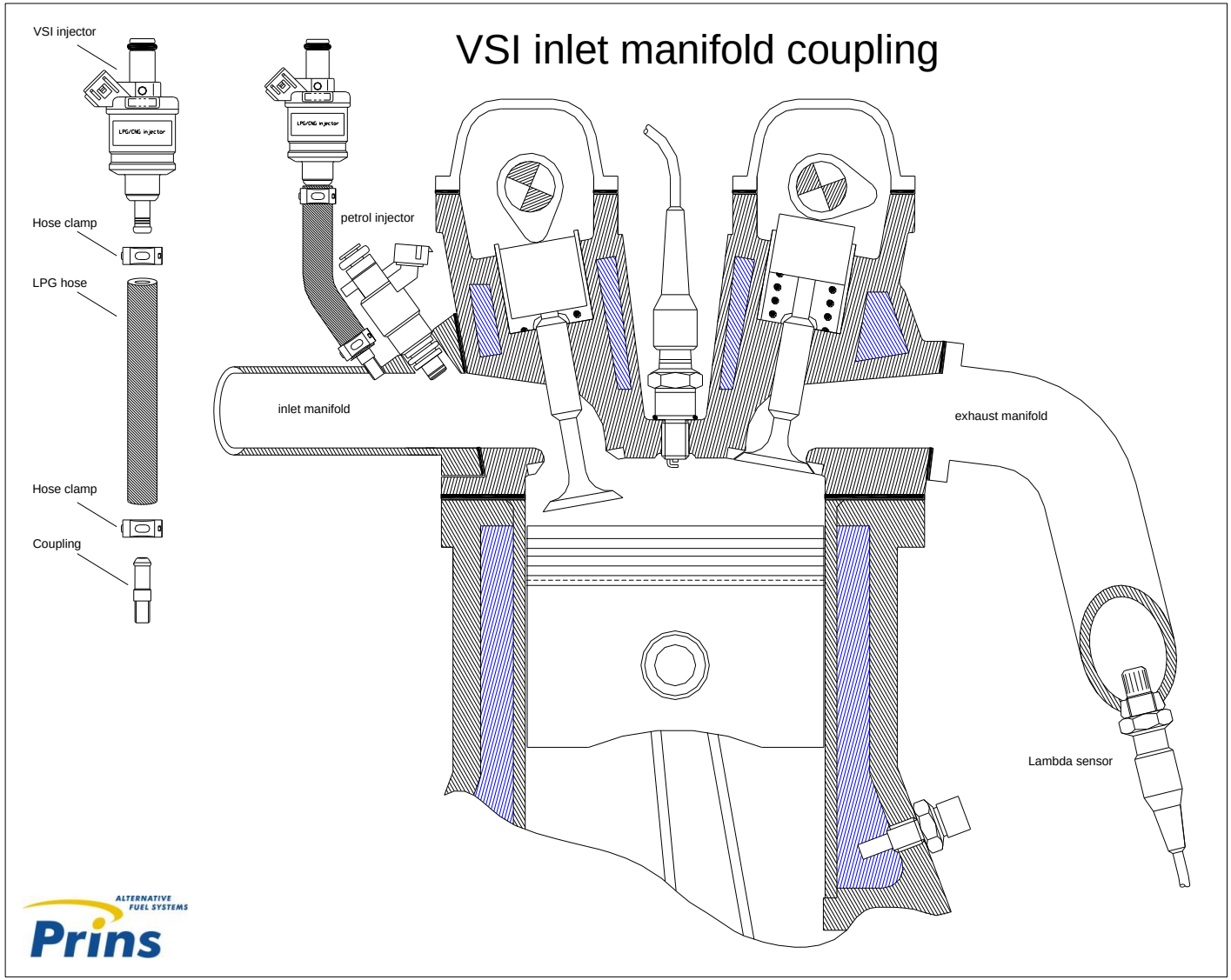


Diagram 1 VSI inlet manifold coupling

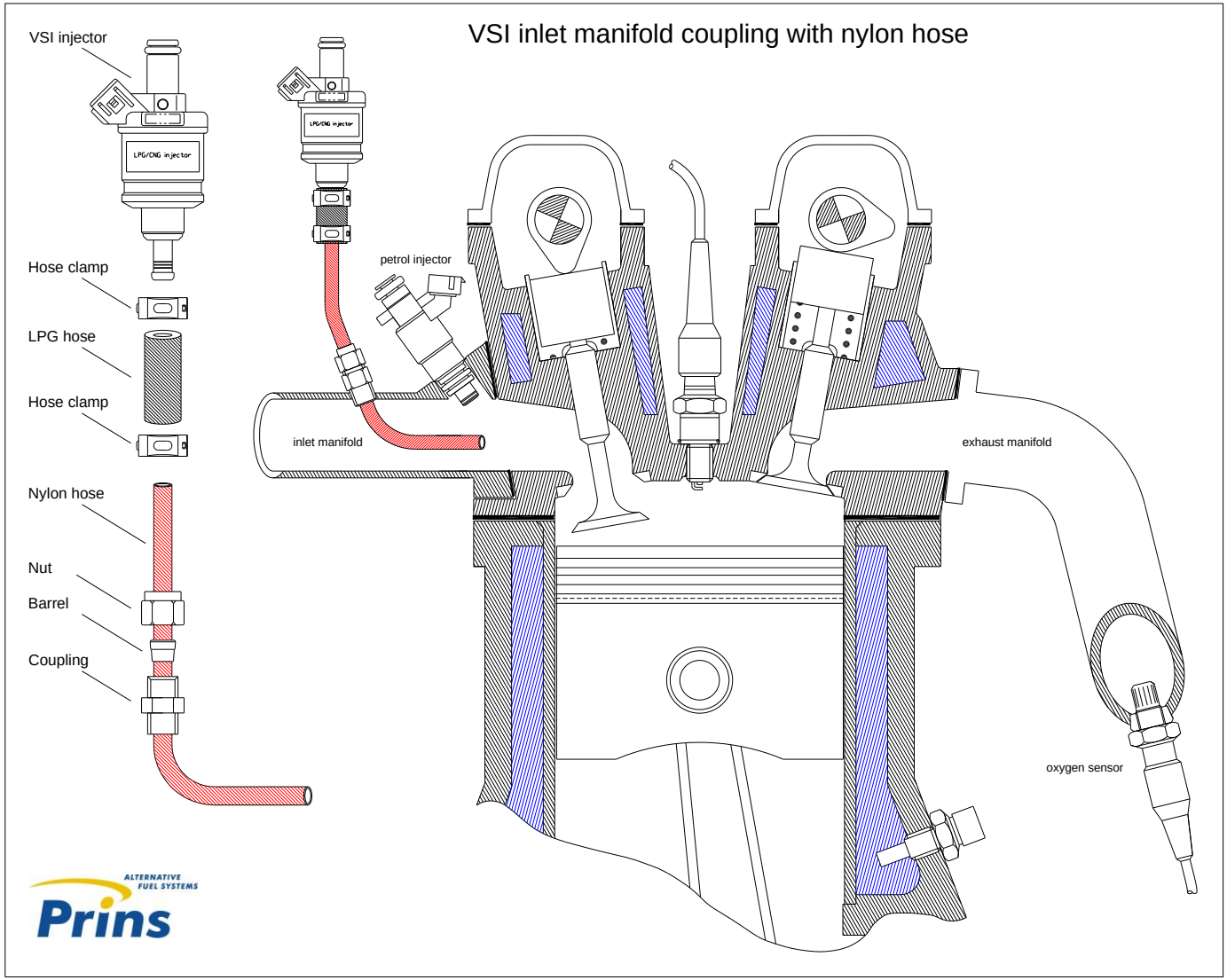


Diagram 2 VSI inlet manifold coupling with nylon hose

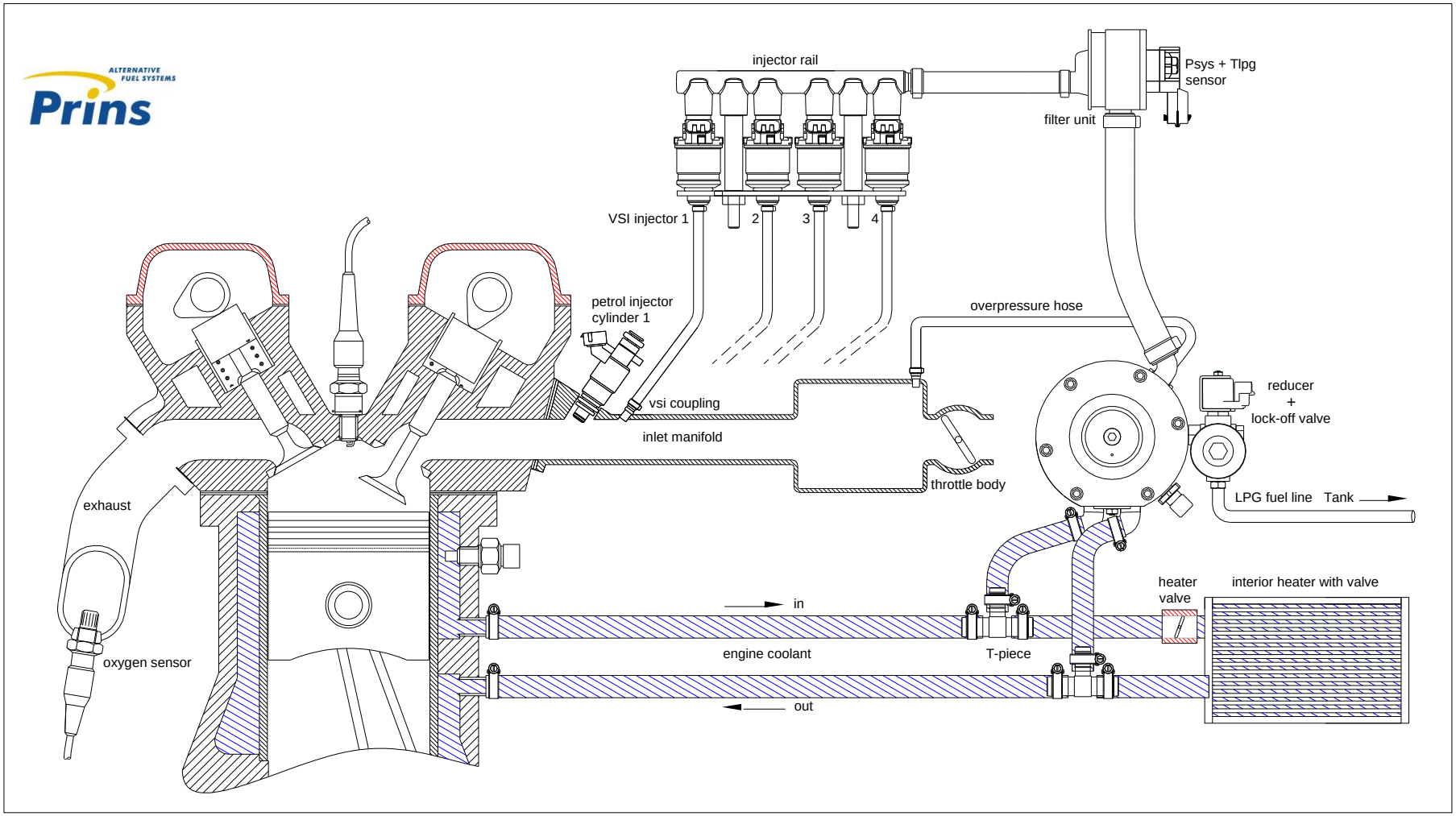


Diagram 3 Parallel water connection

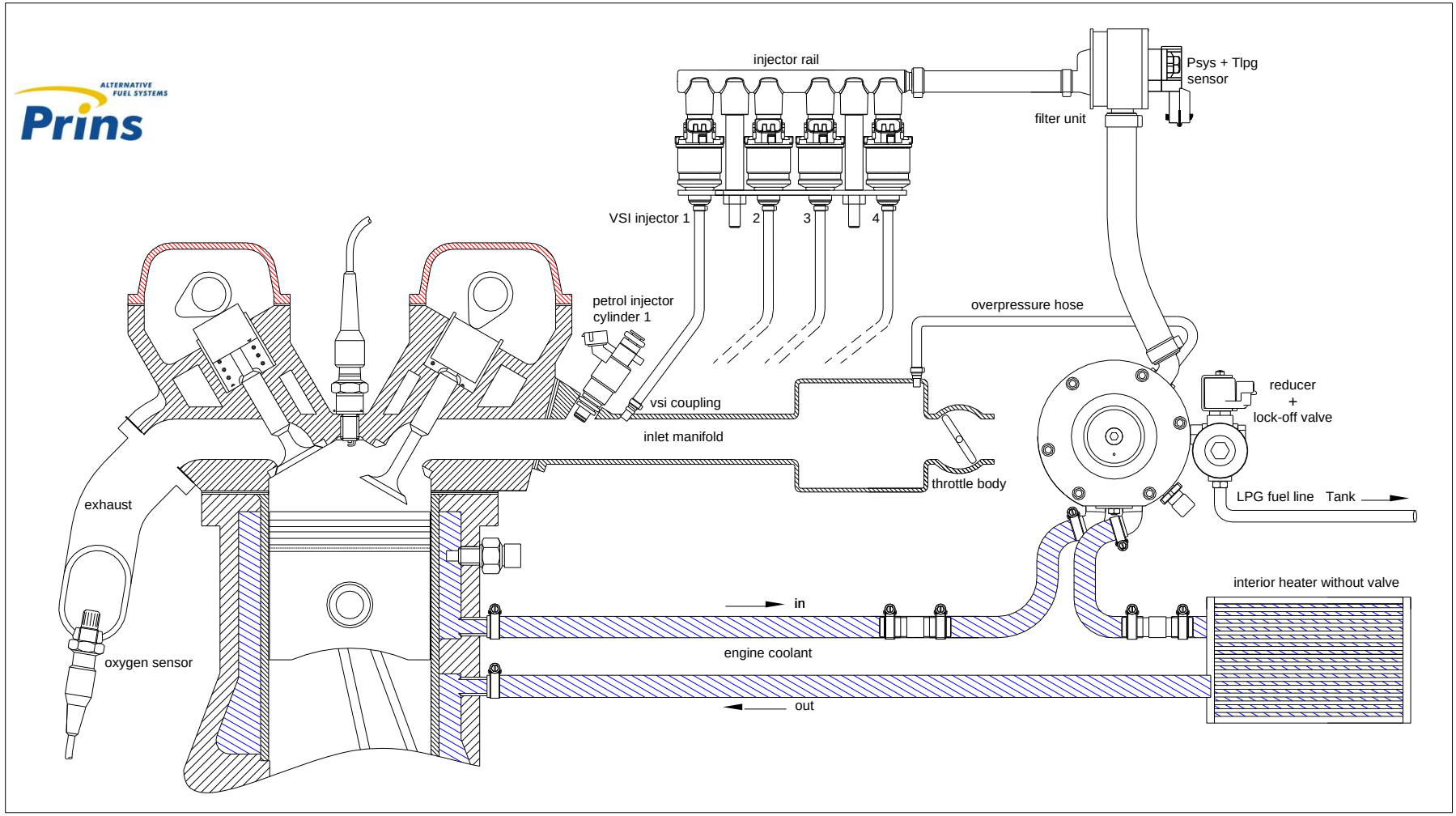


Diagram 4 Serial water connection

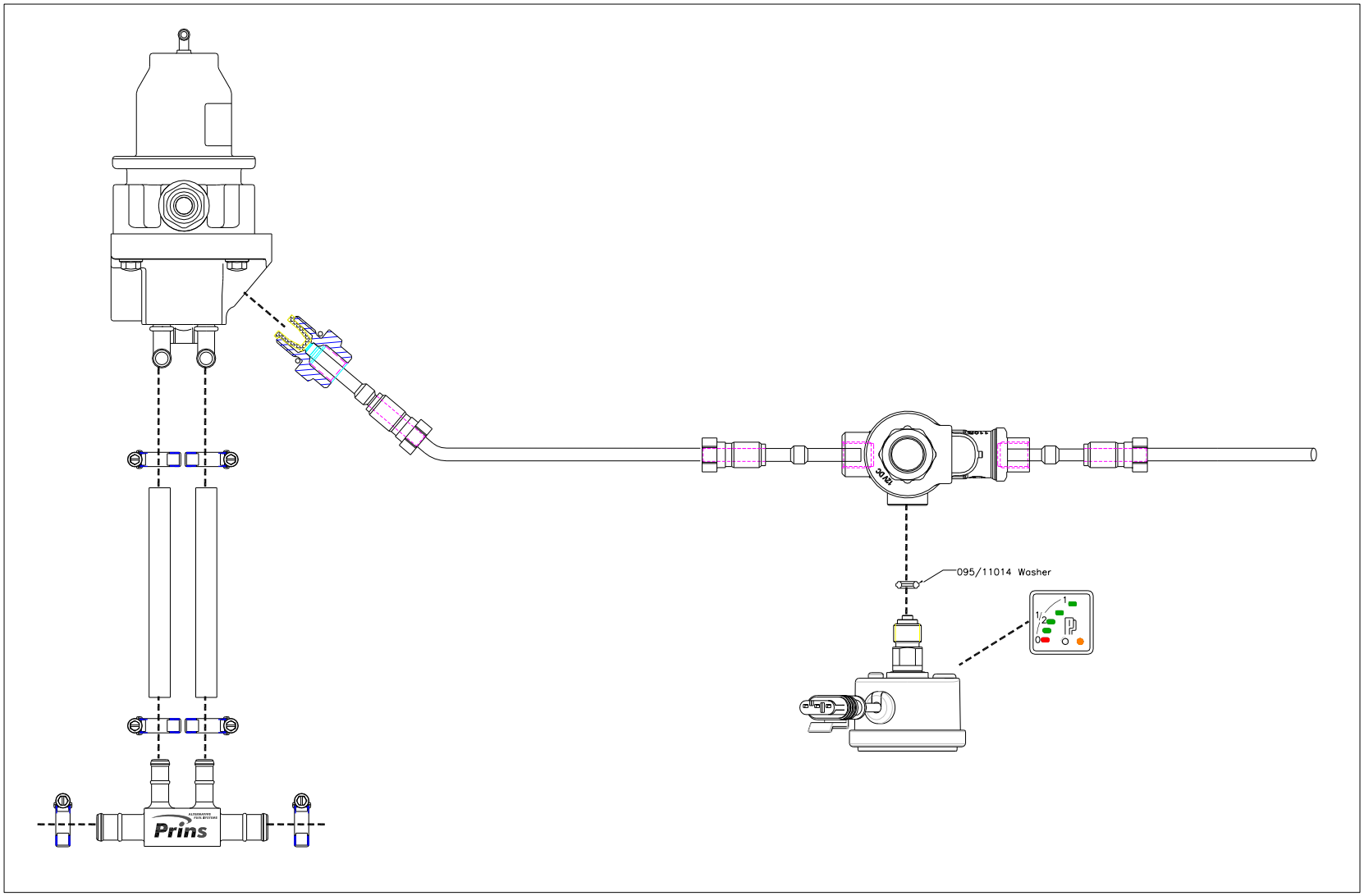
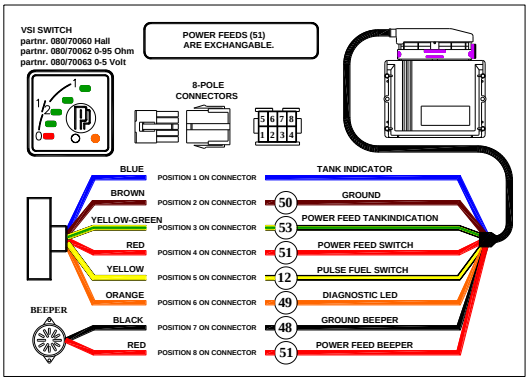


Diagram 5 Serial water connection CNG regulator

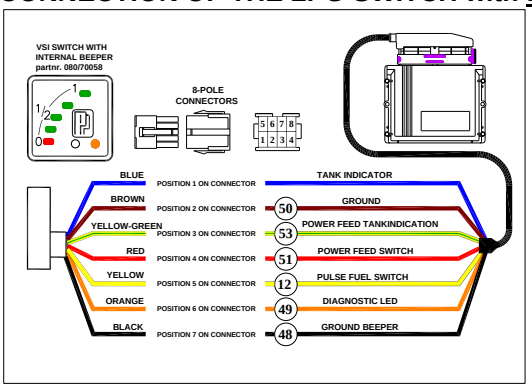
VSI-I fuel switch

Mount the switch on a visible and approachable place for the driver.
When mounting the switch, only push on its sides.
Pushing the switch in the centre may result in damage to the switch.

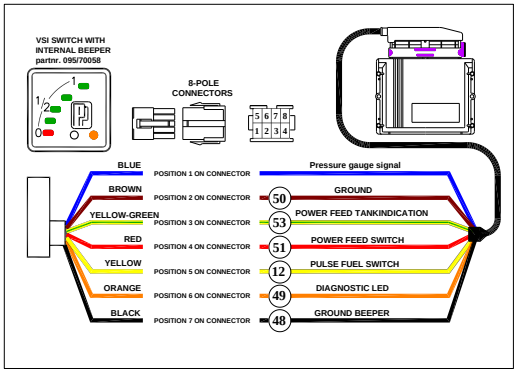
ELECTRICAL CONNECTION OF THE LPG SWITCH with loose beeper



ELECTRICAL CONNECTION OF THE LPG SWITCH with internal beeper



ELECTRICAL CONNECTION OF THE CNG SWITCH with internal beeper



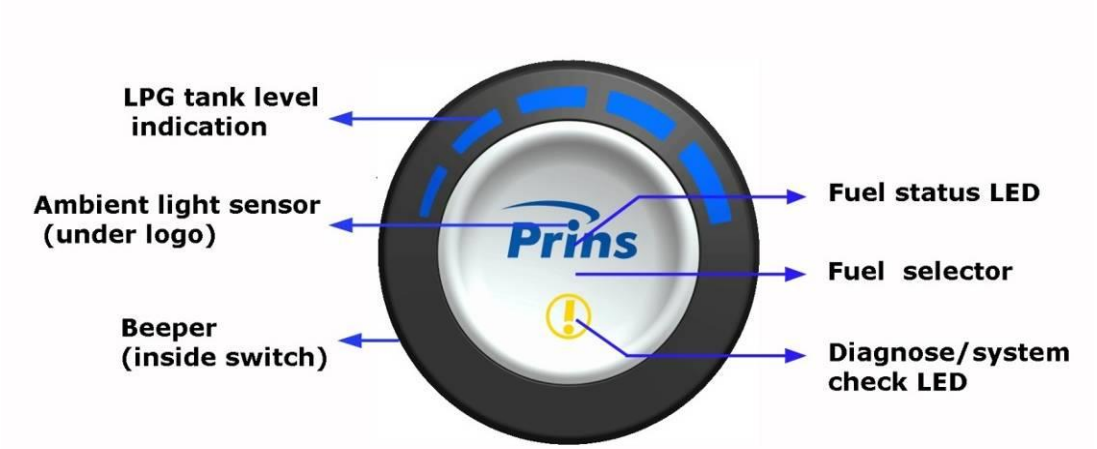
The LPG VSI switch with internal beepers is programmable for different types of tank indicators.
Standard setting of the switch is 0-95 Ohm.
For reprogramming the switch:

1. Make sure that the ignition switch is turned off.
2. Place the VSI main fuse.
3. Push the switch for 5 seconds until a signal sounds (beep).
4. Make a choice immediately: push 1 x for 0-95 Ohm tank indicator
   push 2 x for Hall tank indicator
   (push 3 x preparation VSI2, not used)
5. The VSI switch will confirm the choice with a beep signal (1 or 2 signals)

To change the choice of indicator: remove the VSI main fuse and start with step 1.
The CNG switch is not programmable. The CNG switch is not exchangeable with a LPG switch!

VSI-2.0 fuel switch

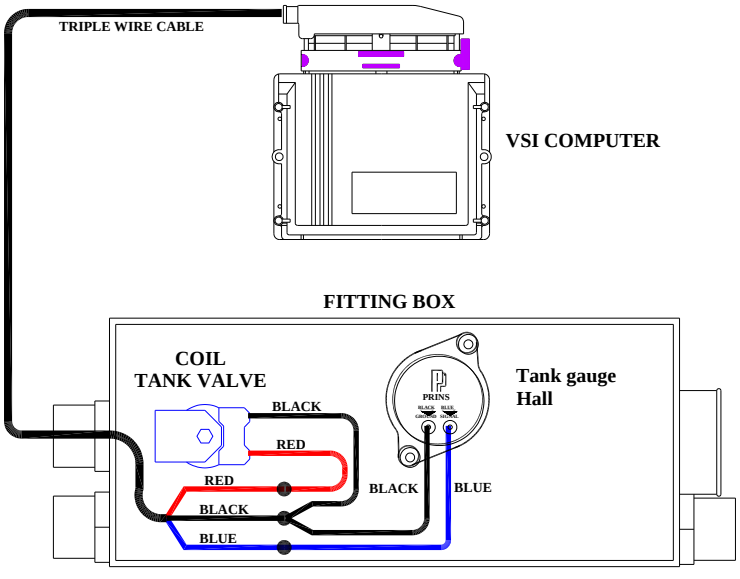
The VSI-2.0 switch is designed for the new VSI-2.0 platform.
The switch is controlled by the VSI-2.0 computer through LIN communication.

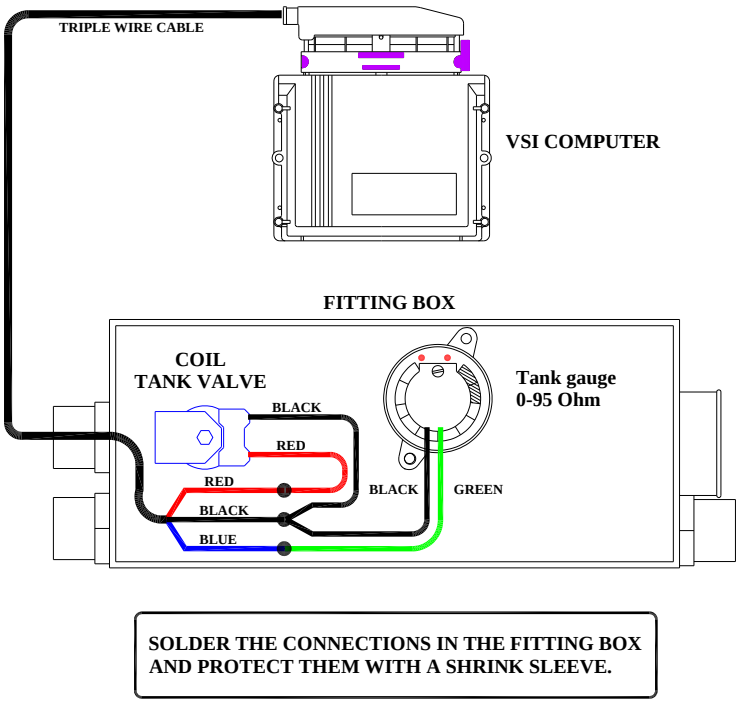


Operation mode	Fuel selection	Active fuel	Status LED	Tank LEDS	Beeper	Diagnose LED
Engine off	GAS/Petrol	No	Off	Off	Off	Off
Contact+ on /engine of	Petrol	No	Off	On	Off	On 3 sec (system check)
Contact+ on /engine of	Gas	No	Flashing	On	Off	On 3sec (system check)
Engine on	Petrol	Petrol	Off	On	Off	Off
Gas standby	Gas	Petrol	Flashing	On	Off	Off
Gas mode	Gas	Gas	On	On	Off	Off
Tank empty, switched back to petrol mode	Gas	Petrol	Flashing	LED 1 On	3x0,5Hz	Off
Tank empty, petrol mode	Petrol	Petrol	Off	Led1 On	Off	Off
Critical fault	Gas	Petrol	Flashing	On	On, 1Hz	On
Non critical fault, petrol mode	Petrol	Petrol	Off	On	Off	Off
Non critical fault, gas mode	Gas	Gas	On	On	Off	Flashing
Switch not activated [activation through AFC-2 software]	---	---	Flashing	Flashing	Off	Flashing

Electrical connections on the LPG reservoir

The wire harness contains the wires for connecting the LPG reservoir.
Refer to the following diagram when connecting the LPG reservoir.





Electrical connections VSI-I wiring harness

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

Wire number / code	Wire colour	Connection	
50 MAIN GND	brown	Connect to the '–' of the battery; use a ring terminal for this purpose.	
25-51 +12V BAT	red	Connect to the '+' of the battery; use a ring terminal for this purpose or solder. Do not place the main fuse into the fuse holder before having completed the installation of the system.	
50 LPG/CNG VLV GND 53 + LPG/CNG VLV	brown yellow - green	Ground shut-off valve. Power supply shut-off valve.	2-pole connector shut-off valve.
42 ECT GND 43 ECT	brown grey	Ground ECT sensor. ECT measurement.	2-pole black connector temperature sensor in the evaporator.
22 RS232 TxD 23 RS232 RxD 50 DIAGNOSE GND 51 +12V DIAG	grey grey brown red	4-pole black connector diagnosis wire connection.	
15 T LPG 17 Psys 18 + 5V Psys 42 Psys GND	grey pale green red brown	4-pole black connector filter unit connection.	
33 33G INJ OUT **1** 34 34 G INJ A PLUS	white - yellow red	Connector VSI-injector to cylinder **1**.	
32 32G INJ OUT **2** 34 34 G INJ A PLUS	green - yellow red	Connector VSI-injector to cylinder **2**.	
31 31G INJ OUT **3** 34 34 G INJ A PLUS	pink - yellow red	Connector VSI-injector to cylinder **3**.	
30 30G INJ OUT **4** 34 34 G INJ A PLUS	blue - yellow red	Connector VSI-injector to cylinder **4**.	
5 5G INJ OUT **5** 6 34 G INJ A PLUS	grey - yellow red	Connector VSI-injector to cylinder **5**.	
4 4G INJ OUT **6** 6 34 G INJ A PLUS	brown - yellow red	Connector VSI-injector to cylinder **6**.	
3 3G INJ OUT **7** 6 34 G INJ A PLUS	light blue - yellow red	Connector VSI-injector to cylinder **7**.	
2 2G INJ OUT **8** 6 34 G INJ A PLUS	red - yellow red	Connector VSI-injector to cylinder **8**.	
44 AD1	green	Option, programmable input	
16 MAP 18 + 5V MAP 42 MAP GND	blue red brown	For measuring the inlet manifold pressure (MAP). In combination with Prins Turbo/MAP sensor.	

PTO CRANK-D	purple / purple-yellow	For interrupting the crank signal on CNG.
50 Ground 53 + CNG Signal	blue green-yellow blue	For measuring the high pressure signal of the CNG system In combination with Prins High Pressure gauge

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

13 IGNITION +	grey-white	Make a connection to ignition + / contact +. Make sure that the voltage will not fail during starting the engine.
46 LAMBDA 1-L	orange	For the measurement of the lambda signal of cylinder bank 1. Connect the wire parallel to the lambda sensor signal wire.
45 LAMBDA 2-R	orange-white	For the measurement of the lambda signal of cylinder bank 2. Connect the wire parallel to the lambda sensor signal wire.
40 RPM	purple-white	For measuring the engine speed. Connect to a Hall-sensor or camshaft sensor, Make sure that the squared signal is not higher then **30 Volt** ! Never connect to the ignition coil (only with a RPM module) !
Injector measure wire (injection module) 39 38 37 36 11 10 9 8	Bicolour / Full colour	For measuring / interrupting the petrol injectors : Interrupt each petrol injector control wire (injector min) Each VSI wire has a cylinder number printed on the wire, connect this wire to the corresponding petrol injector. Connect the **bicoloured** VSI measuring wire to the **ecu side**, (wire code: ECU SIDE). Connect the **accompanying full coloured** VSI wire to the **petrol injector side** (wire code: MIN INJ SIDE). See diagrams in Installation Manual General part 1 / 2. **Attention:** **Each bicoloured measuring wire corresponds to a specific LPG injector and cylinder number. Do not interchange the wires.**

Injection module		=> VSI-ecm =>	VSI injector rail
White-yellow	vsi nr. 39 (petrol injector cyl.1)	=>VSI-ecm=> White-yellow	vsi nr.33 (vsi injector cyl.1)
Green-yellow	vsi nr. 38 (petrol injector cyl.2)	=>VSI-ecm=> Green-yellow	vsi nr.32 (vsi injector cyl.2)
Pink-yellow	vsi nr. 37 (petrol injector cyl.3)	=>VSI-ecm=> Pink-yellow	vsi nr.31 (vsi injector cyl.3)
Blue-yellow	vsi nr. 36 (petrol injector cyl.4)	=>VSI-ecm=> Blue-yellow	vsi nr.30 (vsi injector cyl.4)
Grey-yellow	vsi nr. 11 (petrol injector cyl.5)	=>VSI-ecm=> Grey-yellow	vsi nr.05 (vsi injector cyl.5)
Bruin-yellow	vsi nr. 10 (petrol injector cyl.6)	=>VSI-ecm=> Brown-yellow	vsi nr.04 (vsi injector cyl.6)
Light blue-yellow	vsi nr. 09 (petrol injector cyl.7)	=>VSI-ecm=> Light blue-yellow	vsi nr.03 (vsi injector cyl.7)
Red-yellow	vsi nr. 08 (petrol injector cyl.8)	=>VSI-ecm=> Red-yellow	vsi nr.02 (vsi injector cyl.8)

Electrical connections VSI-2.0 wiring harness

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

Wire number / code	Wire colour	Connection
1 ground battery	brown	Connect to the '–' of the battery; use a ring terminal for this purpose. Wire colour : Wire location :
32 ground battery sense	brown	Connect to the '–' of the battery together with VSI wire 1 ground battery.

44 +12V battery	red	Connect to the '+' of the battery; use a ring terminal for this purpose or solder. Wire colour : Wire location : Do not place the fuse in the holder before having completed the installation of the LPG system.
13 +12V battery sense	red	Connect to the '+' of the battery together with VSI wire 44 +12V battery.

112 + petrol injectors or ignition+ (+15)	red-grey	Make a connection to + petrol injector or ignition+ (+15) Wire colour : Wire location :

20 AD3 (lambda 1)	orange	For the measurement of the lambda signal of cylinder bank 1 Connect the wire in parallel to the lambda sensor. Wire colour : Wire location :
19 AD4 (lambda 2)	orange-white	For the measurement of the lambda signal of cylinder bank 2 Connect the wire in parallel to the lambda sensor. Wire colour : Wire location :

18 AD1 (MAP)	blue	For measuring the inlet manifold pressure (MAP). Wire colour : Wire location :

17 AD2 (Valve Care)	green	Optional connection. Wire colour : Wire location :

8 RPM	purple-white	For measuring the engine speed. Wire colour : Wire location :

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

3-pole connector 18 AD1 (MAP) 27 +5 volt sensor 37 C ground	 blue brown red	For measuring the inlet manifold pressure (Prins MAP sensor). Connect the 3-pole connector to the Prins MAP sensor.

2-pole blue connector 15 Tect 34 C ground	 grey brown	For measuring the engine coolant temperature (Tect). Connect the connector to the reducer temperature sensor.

4-pole connector 35 C ground 14 T-Gas 9 +5 Volt sensor 16 Psys	 brown grey red green	For measuring gas pressure and temperature. Connect the connector to the filter unit sensor.

2-pole connector 24 +12V reducer lock-off 31 Ground reducer lock-off	 yellow-green brown	Connect the connector to the reducer lock-off valve.

4-pole connector 46 Service TxD 65 Service RxD 68 C ground	 grey grey brown	Diagnose connector.

3-pole connector 3 +12V fuel switch 66 ground fuel switch 49 LIN fuel switch	 red brown yellow	Connect to the VSI switch.

Tank wiring loom 2 Power tank valve 1 12 Tank level in 26 ground tank lock off	 red blue black	 Connect to the tank lock-off. Connect the tank level gauge. Connect to the tank lock-off.

Check and measure the wiring in case of changes in the cars wiring colours.
Some wires/connectors are only available in the Full Spec VSI loom.
Insulate all not used wires.

51 CAN 1 High 70 CAN 1 Low	blue-yellow blue	Optional / insulate / Connect to EOBD diagnose connector Pin : 6 Pin : 14
53 CAN 2 High 72 CAN 2 Low	pink-yellow pink	Optional / insulate / Connect to EOBD diagnose connector
23 ground switched 2	yellow	Optional / insulate
28 +5V (EXT)	red	Optional / insulate
29 +5V PU1 (optional)	red	Optional / insulate
30 +5V PU2 (optional)	red	Optional / insulate
43 +GAS injectors	red	Optional / insulate
45 K-line	pink	Optional / insulate
57 +12V (external)	red	Optional / insulate
76 power tank valve 2 22 ground switched 1	red brown	Connect to the second tank lock-off valve. Optional / insulate
3-pole connector 11 + manometer 12 tank level in 33 ground manometer	 red blue brown	 Connect to the CNG high pressure gauge Optional / insulate

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

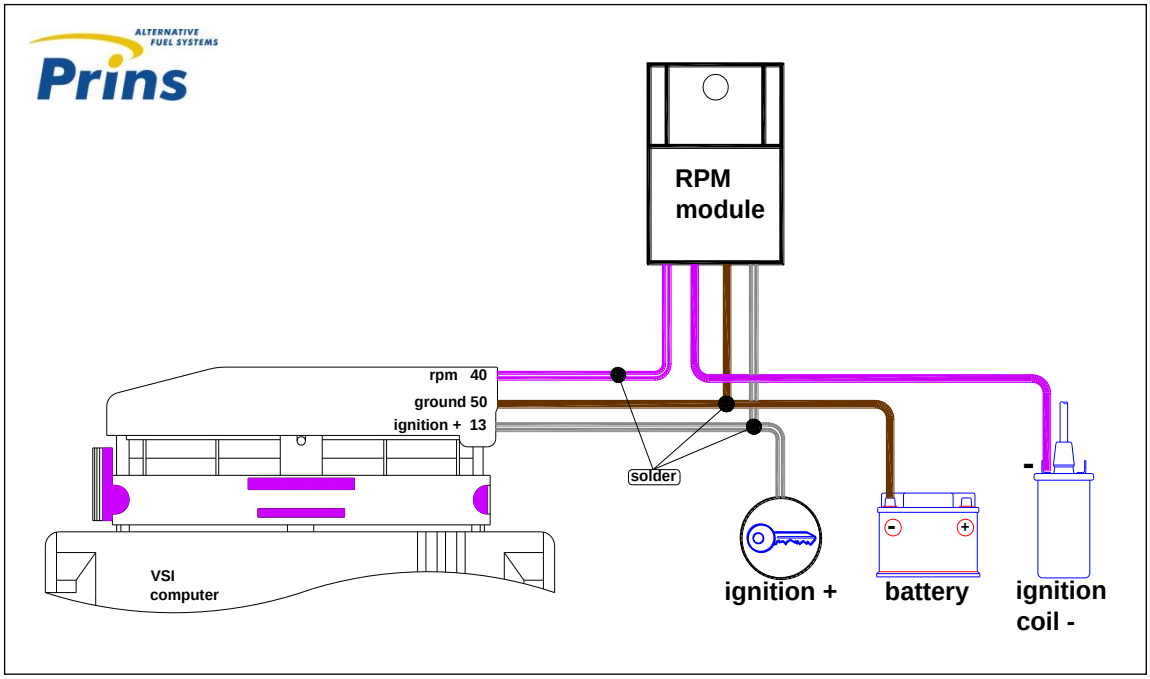
Attention:
Each bicoloured measuring wire corresponds to a specific VSI injector and petrol injector / cylinder number. Do not interchange the wires.

VSI measure wire nr. :	Full coloured / Bicoloured	To interrupt petrol injector wire colour / location
121 ecu side injector 1 120 injector side inj 1	white-yellow white	Colour : Location :
119 ecu side injector 2 118 injector side inj 2	green-yellow green	Colour : Location :
117 ecu side injector 3 116 injector side inj 3	pink-yellow pink	Colour : Location :
115 ecu side injector 4 114 injector side inj 4	blue-yellow blue	Colour : Location :

VSI injector connectors:

98 106	–GAS INJ 1 +GAS INJ 1	white-yellow red	Connector VSI-injector cylinder **1**. (timing belt side)
99 107	–GAS INJ 2 +GAS INJ 2	green-yellow red	Connector VSI-injector cylinder **2**.
100 108	–GAS INJ 3 +GAS INJ 3	pink-yellow red	Connector VSI-injector cylinder **3**.
82 90	–GAS INJ 4 +GAS INJ 4	blue-yellow red	Connector VSI-injector cylinder **4**.

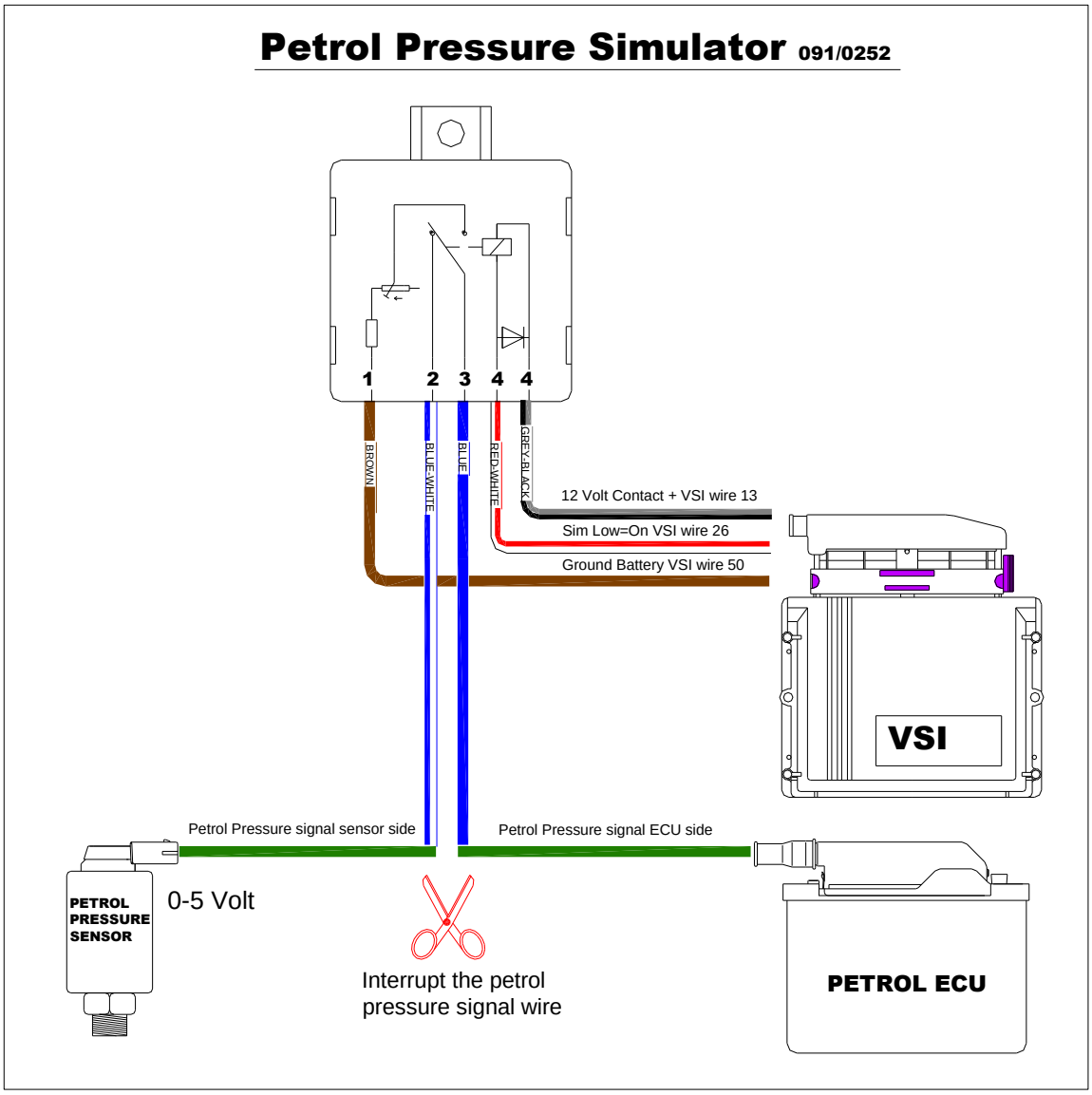
Electrical connections RPM module 091/0236



- Connect the brown wire of the RPM module to the brown wire nr.50 of the VSI wiring loom.
- Connect the purple-white wire of the RPM module to the purple-white wire nr.40 of the VSI wiring loom.
- Connect the grey-white wire of the RPM module to the grey-white wire nr.13 of the VSI wiring loom.
- Connect the purple wire of the RPM module to the ignition coil driver wire.

Electrical connections Petrol Pressure Simulator 091/0252

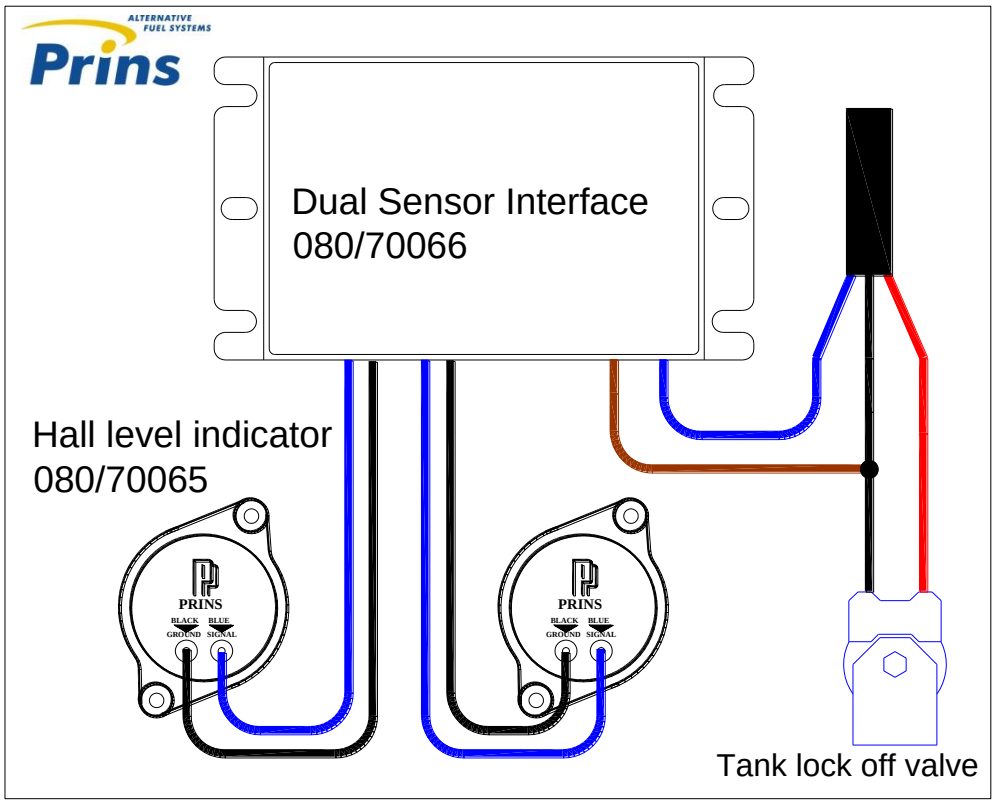
Engines equipped with a return less fuel system. These engines can generate trouble codes and/or have difficulties with the fuel trims(mixture) on both petrol and lpg.



Brands: Mainly brands who are connected with Ford technologies like:
* Ford models from 2003/2004
* Jaguar models from 2003/2004
* Some Volvo models from 2003

Connections and Set-up
Connect the PPS module according the shown schematic. Measure the voltage, on petrol, for the blue wire (pressure sensor signal wire) when the engine is idling. Or read the actual petrol pressure when you have the disposal of a scan tool which can read the actual petrol system pressure.
Next we have to setup the same Voltage (pressure) when running on LPG via de pot meter. The pot meter is accessible when you remove the small protection cover of the module.

Electrical connections Dual Sensor Interface (DSI)

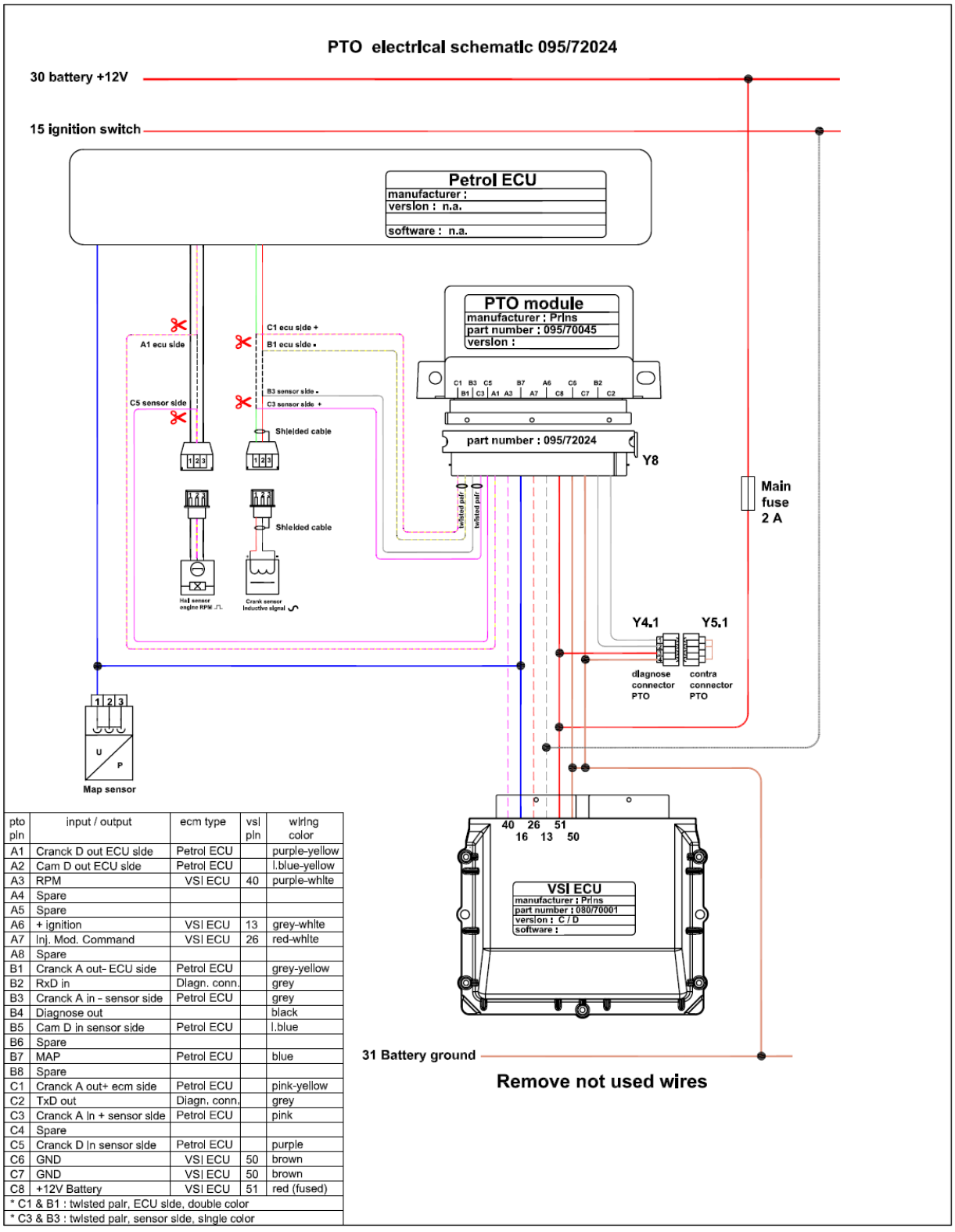


DSI connection:

Connect the interface wiring according to drawing, all blue and black wires are exchangeable since they are internally connected.

The DSI makes it possible to connect two level sensors to one lpg switch.
The DSI will always show the highest lpg level on the switch.

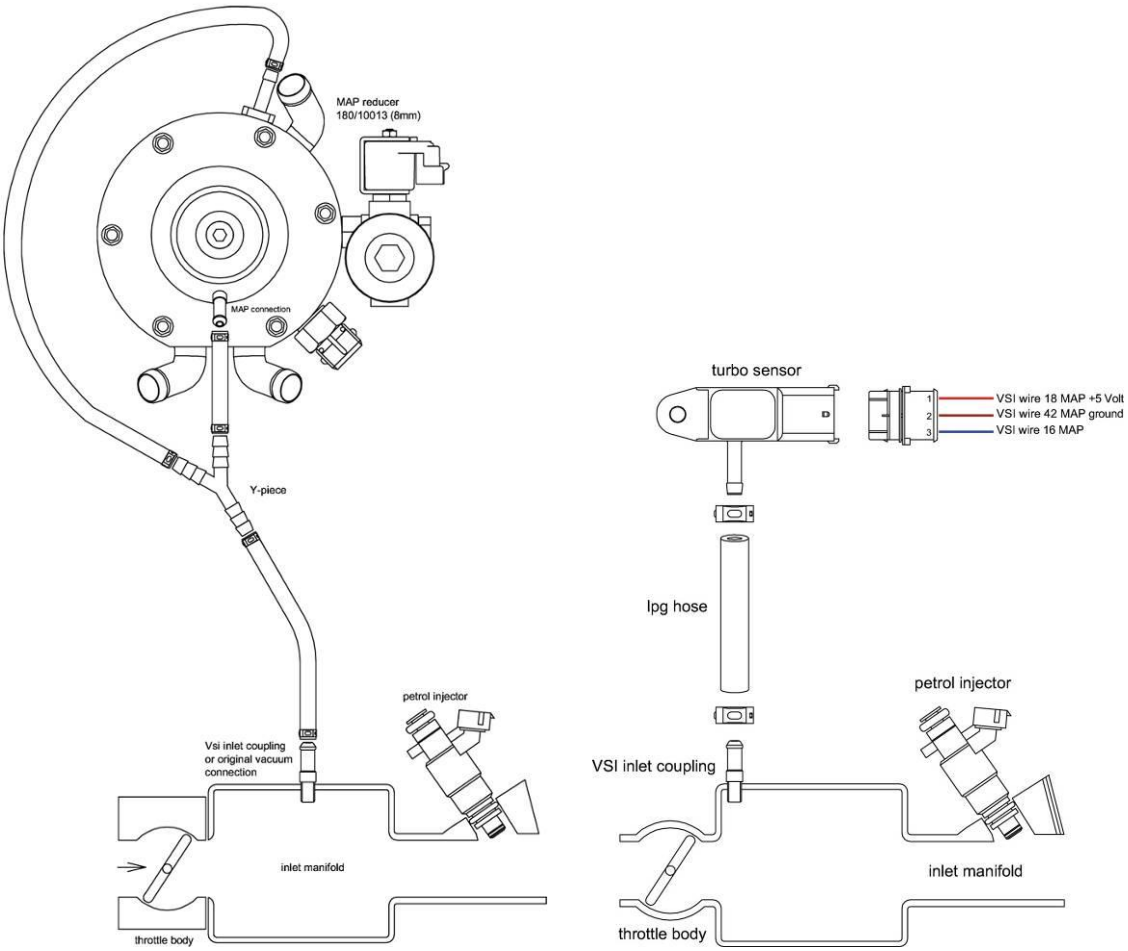
Electrical connections CNG Prins Timing Optimizer (PTO)

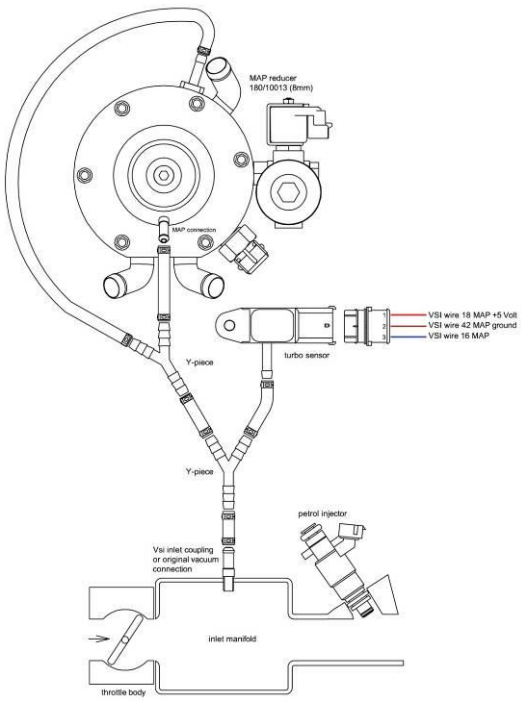


pto pin	input / output	ecm type	vsi pin	wiring color
A1	Cranck D out ECU side	Petrol ECU		purple-yellow
A2	Cam D out ECU side	Petrol ECU		l.blue-yellow
A3	RPM	VSI ECU	40	purple-white
A4	Spare			
A5	Spare			
A6	+ ignition	VSI ECU	13	grey-white
A7	Inj. Mod. Command	VSI ECU	26	red-white
A8	Spare			
B1	Cranck A out- ECU side	Petrol ECU		grey-yellow
B2	RxD in	Diagn. conn.		grey
B3	Cranck A in - sensor side	Petrol ECU		grey
B4	Diagnose out			black
B5	Cam D in sensor side	Petrol ECU		l.blue
B6	Spare			
B7	MAP	Petrol ECU		blue
B8	Spare			
C1	Cranck A out+ ecm side	Petrol ECU		pink-yellow
C2	TxD out	Diagn. conn.		grey
C3	Cranck A in + sensor side	Petrol ECU		pink
C4	Spare			
C5	Cranck D in sensor side	Petrol ECU		purple
C6	GND	VSI ECU	50	brown
C7	GND	VSI ECU	50	brown
C8	+12V Battery	VSI ECU	51	red (fused)
* C1 & B1 : twisted pair, ECU side, double color				
* C3 & B3 : twisted pair, sensor side, single color				

Connect the PTO module according the shown diagram.
Check if the latest software is downloaded in the PTO!

Prins Turbo / MAP sensor





VSI-1 LPG Basic system overview

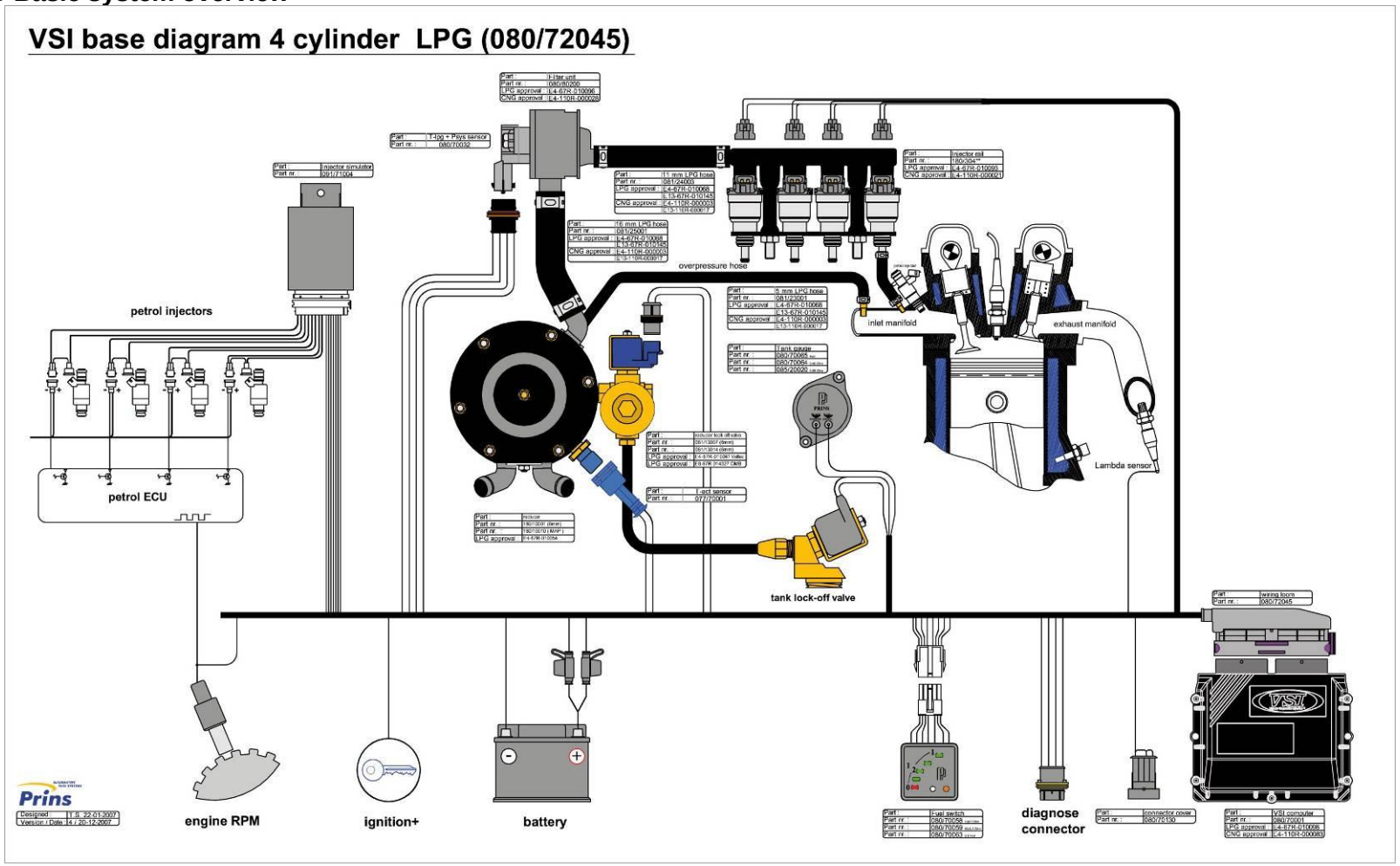


Diagram 5 LPG Base layout VSI 4 cylinder connector

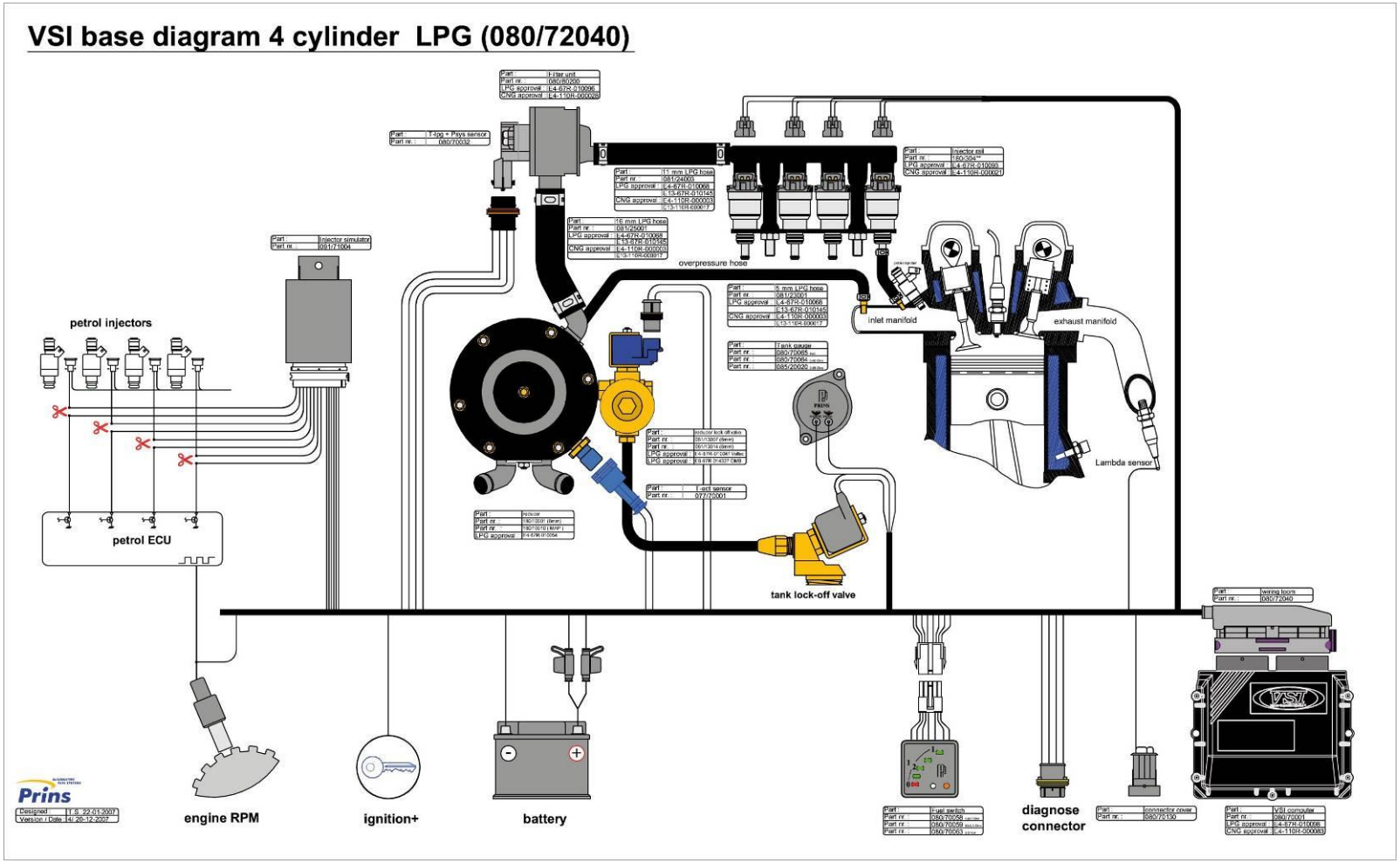


Diagram 6 LPG Base layout VSI 4 cylinder solder

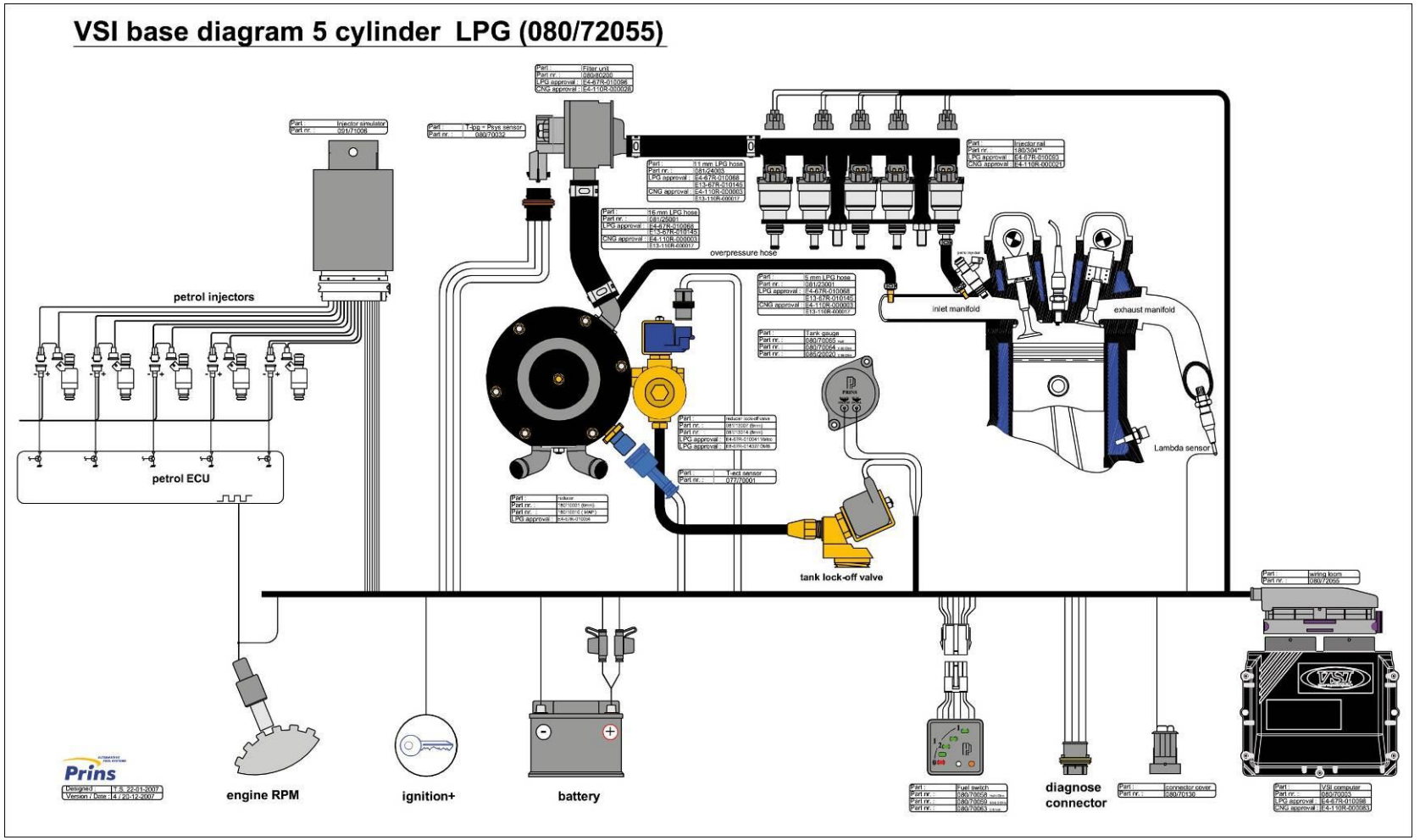


Diagram 7 LPG Base layout VSI 5 cylinder

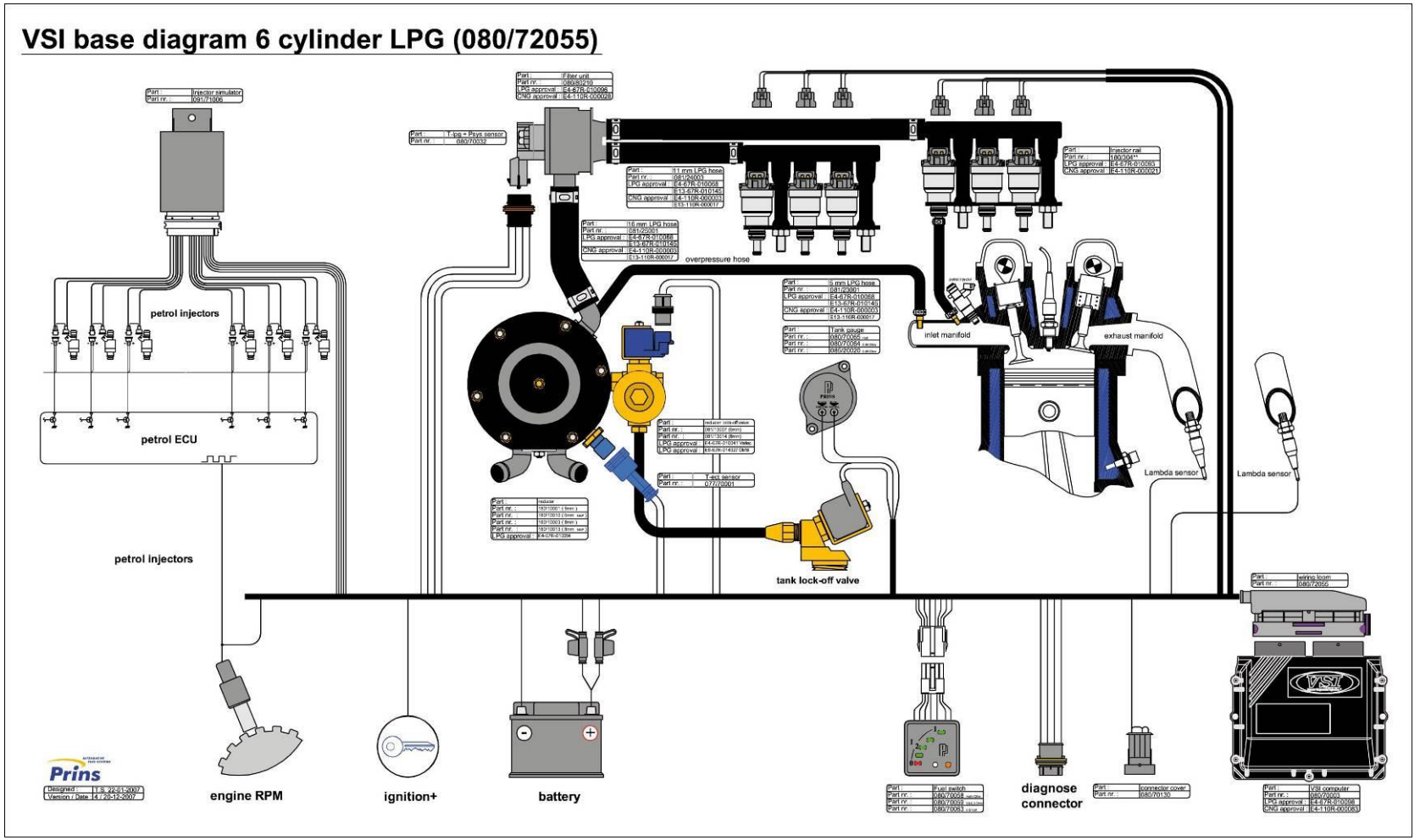


Diagram 8 LPG Base layout VSI 6 cylinder connector

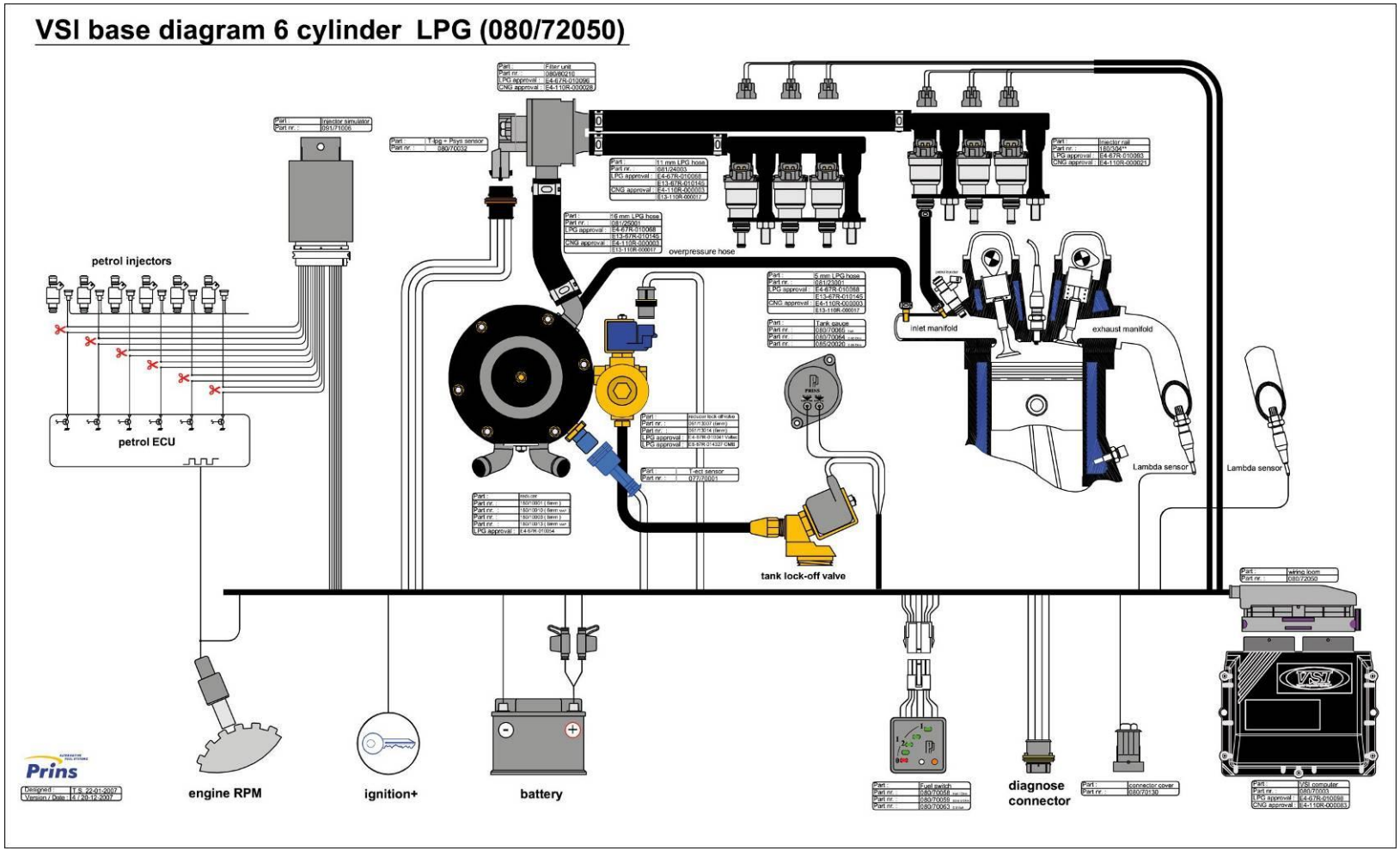


Diagram 9 LPG Base layout VSI 6 cylinder solder

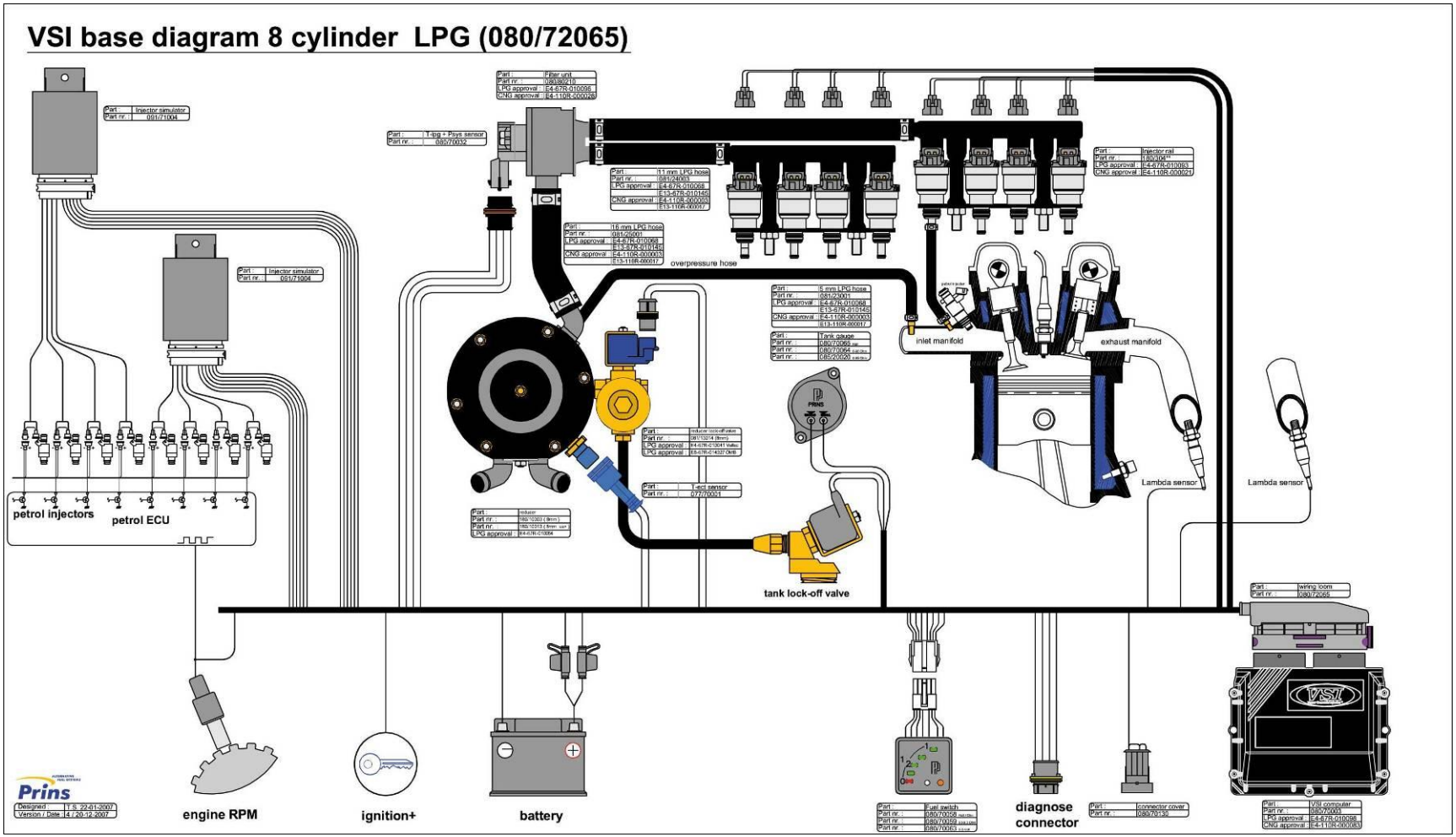


Diagram 10 LPG Base layout VSI 8 cylinder connector

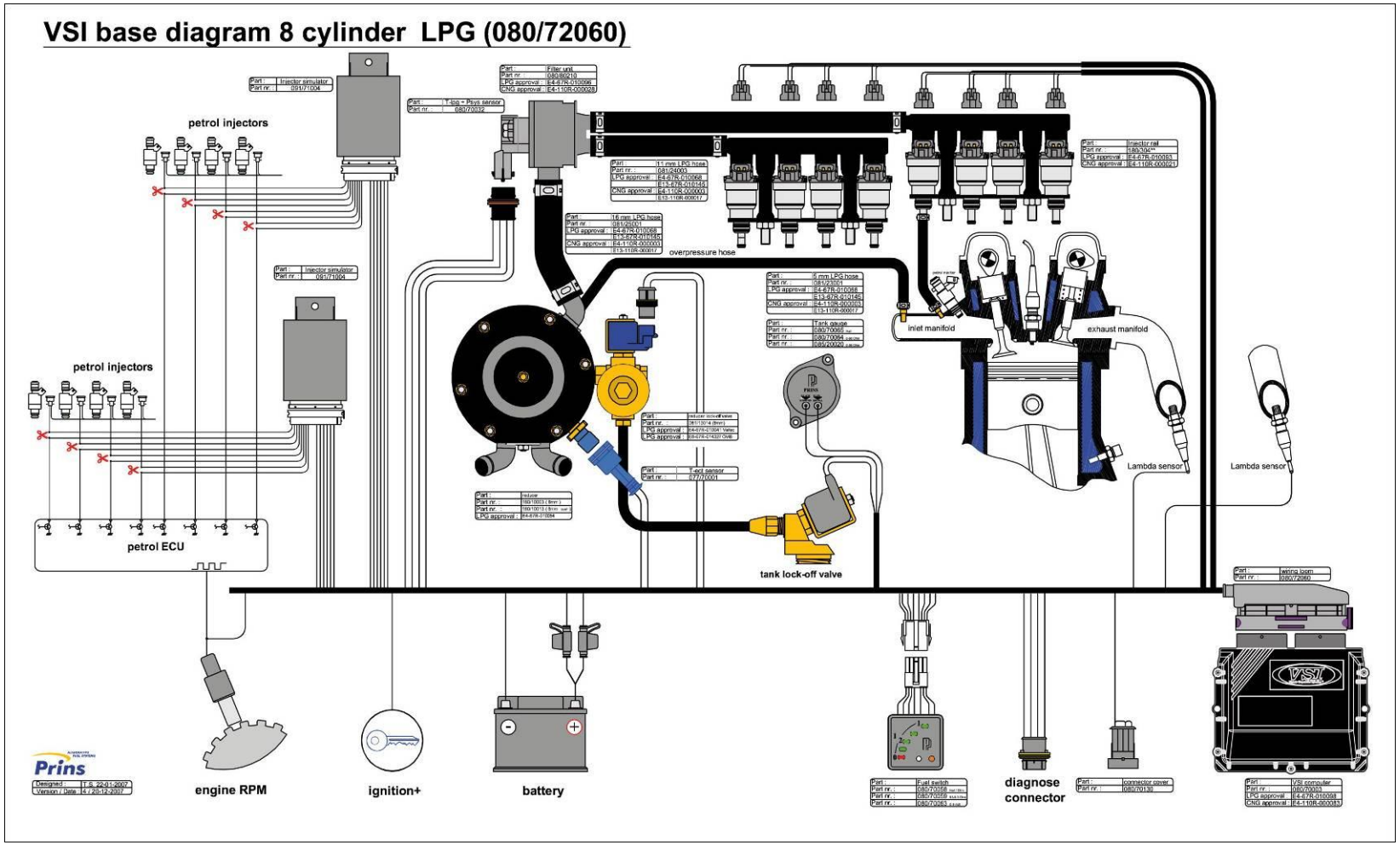


Diagram 11 LPG Base layout VSI 8 cylinder solder

VSI-1 CNG Basic system overview

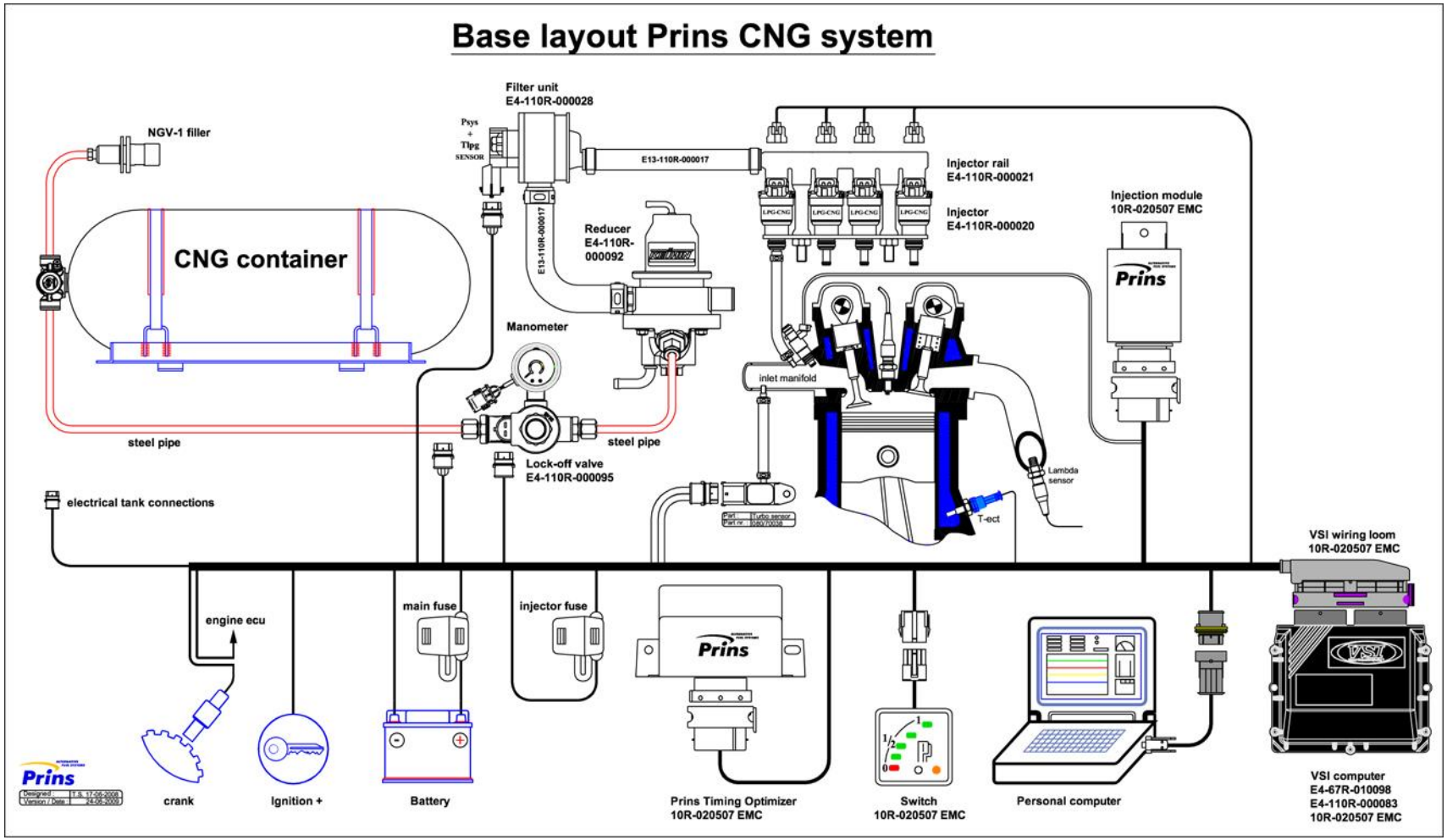


Diagram 12 CNG Base layout

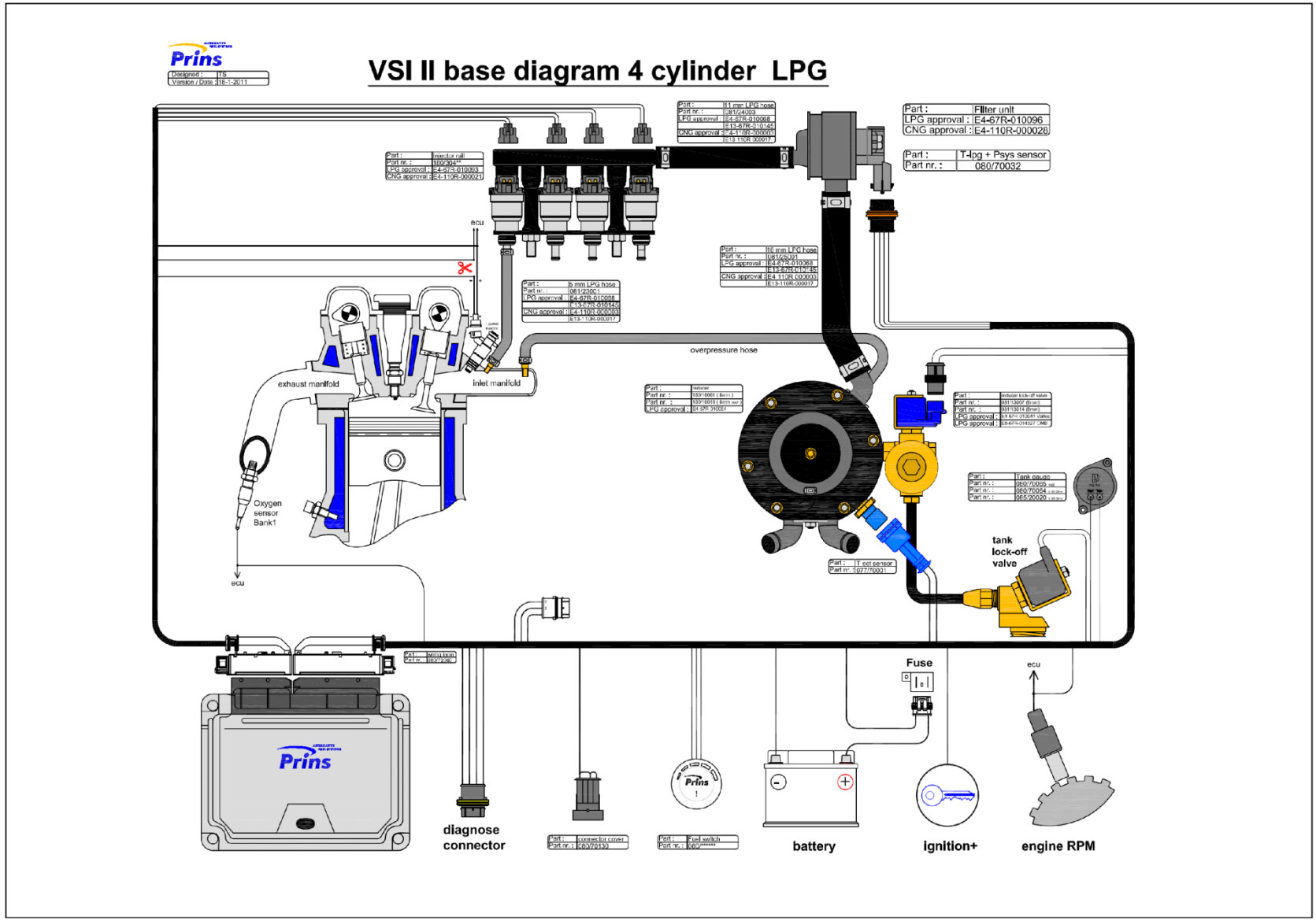


Diagram 13 VSI-2.0 LPG Base layout

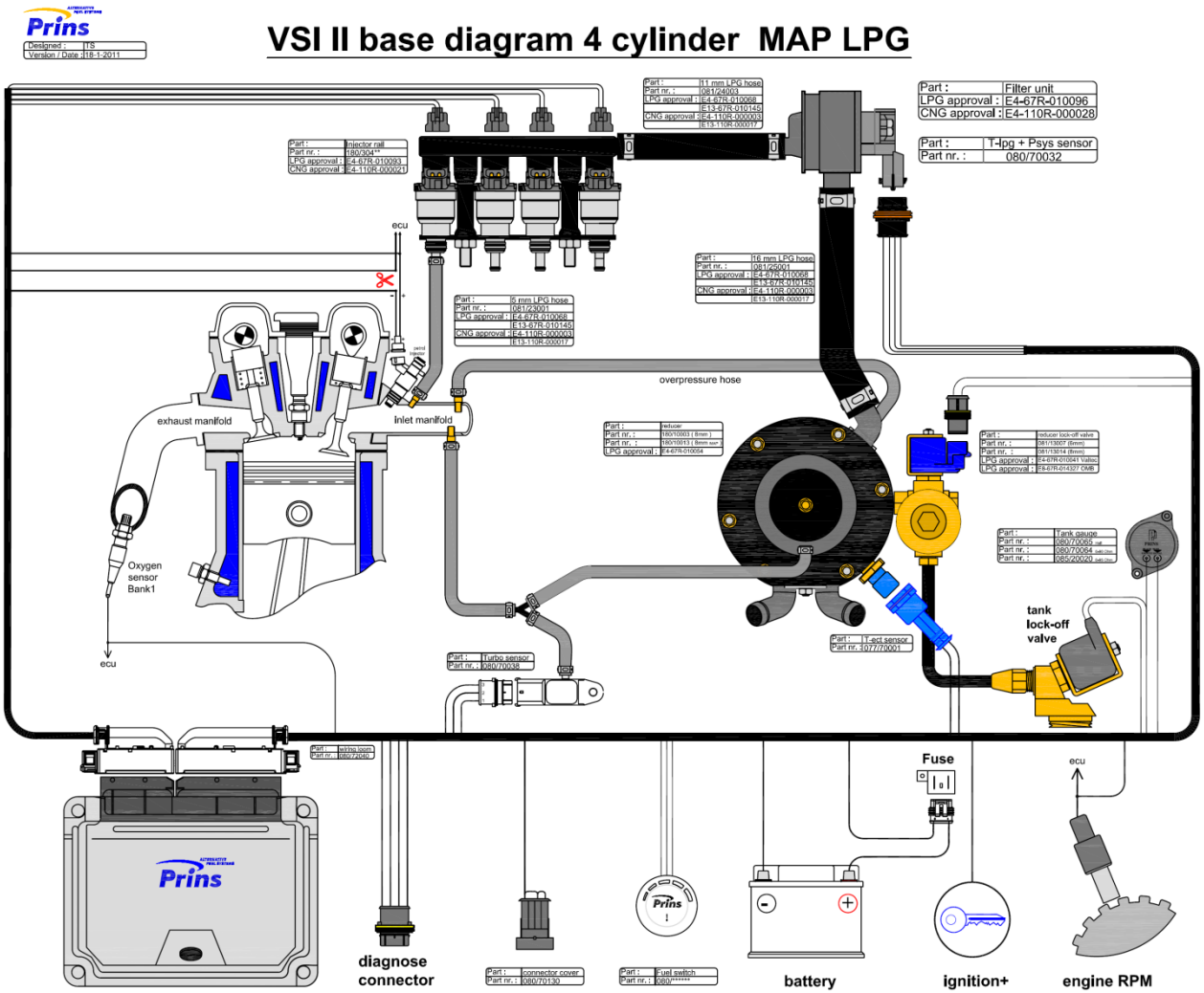


Diagram 14 VSI-2.0 MAP LPG Base layout

VSI-1 Injection module

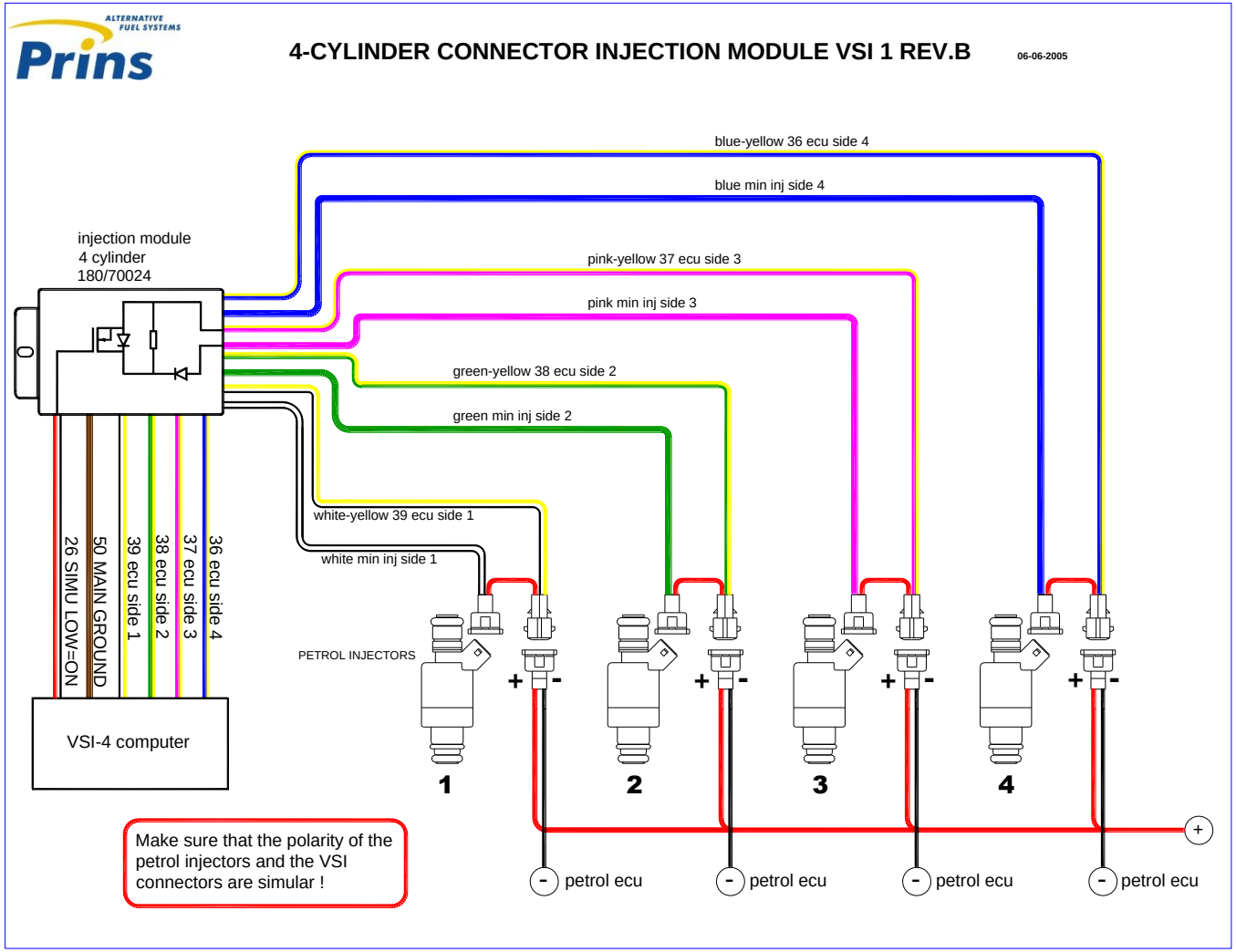


Diagram 13 Injection module 4-cylinder (180/70024 connector)

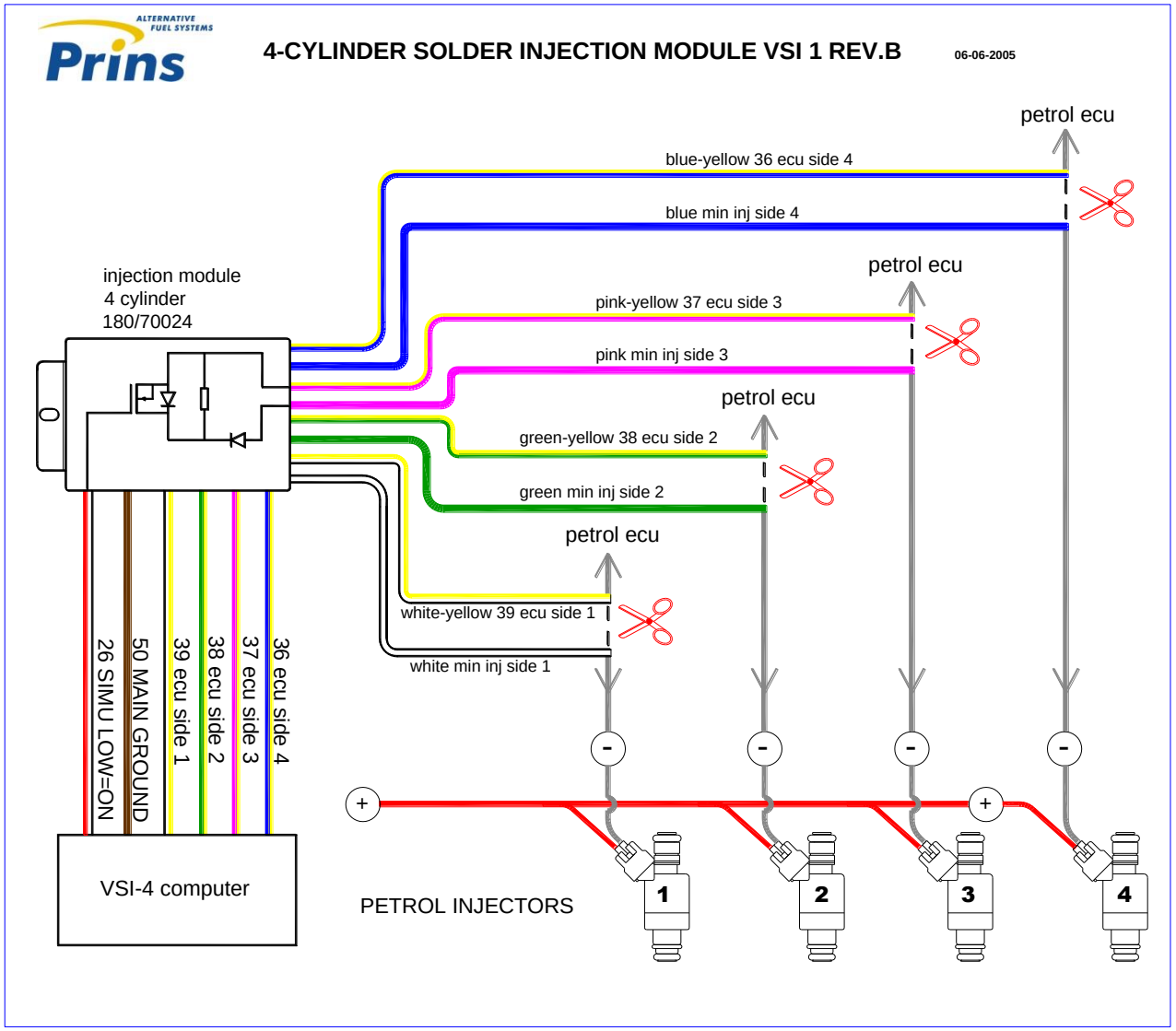


Diagram 14 Injection module 4-cylinder (180/ 70024 solder)

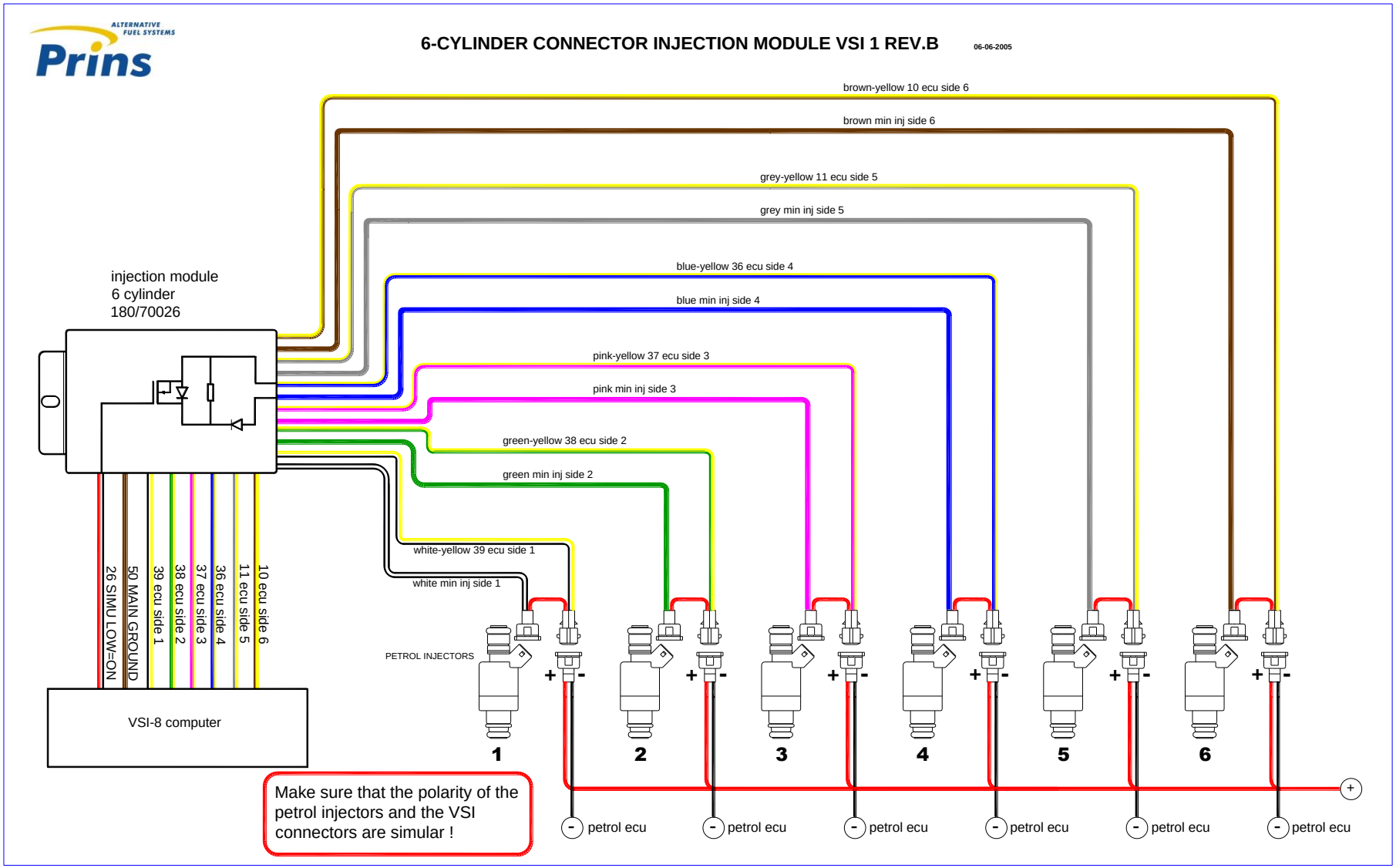


Diagram 15 Injection module 6-cylinder (180/70026 connector)

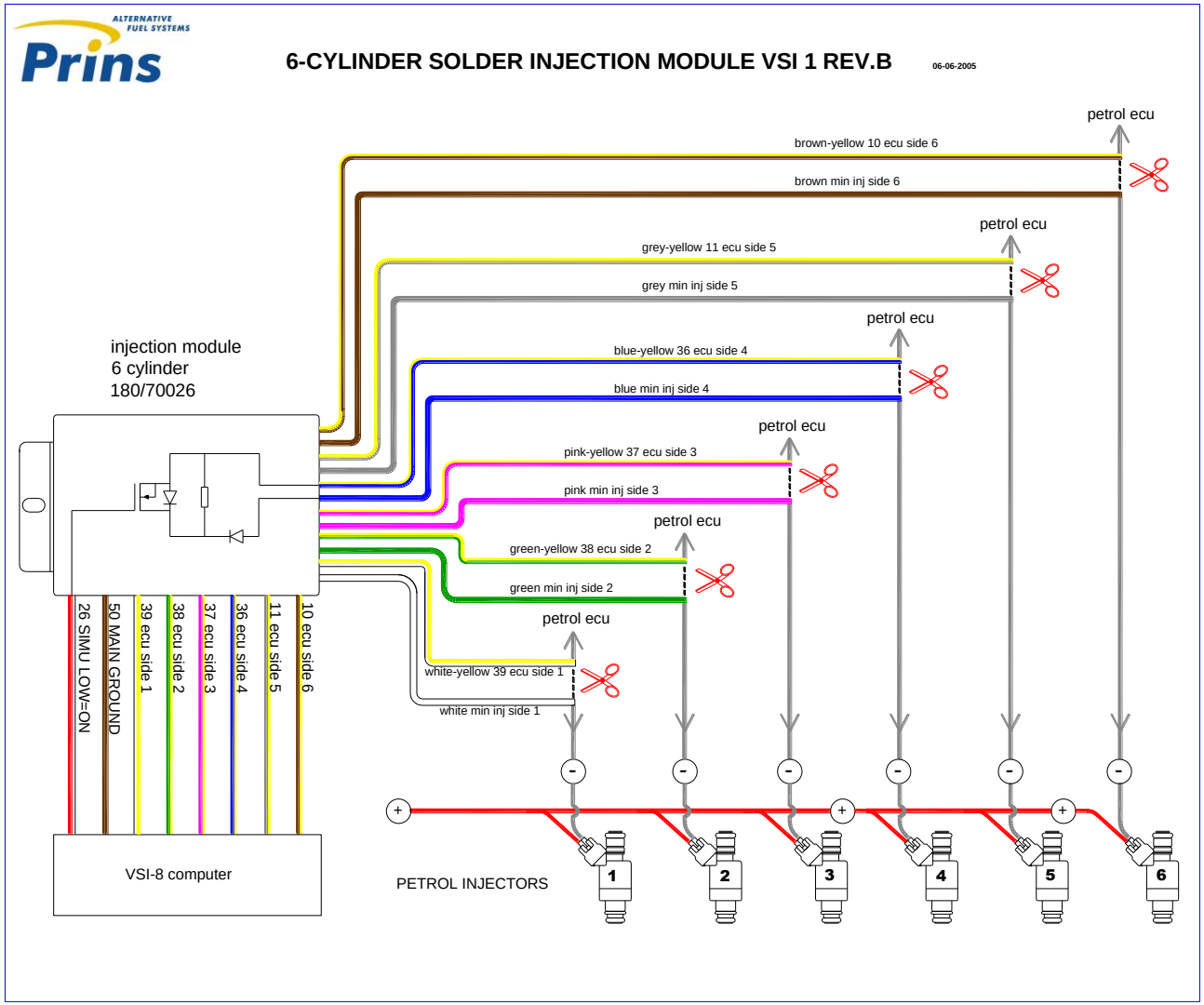


Diagram 16 Injection module 6-cylinder (180/70026 solder)

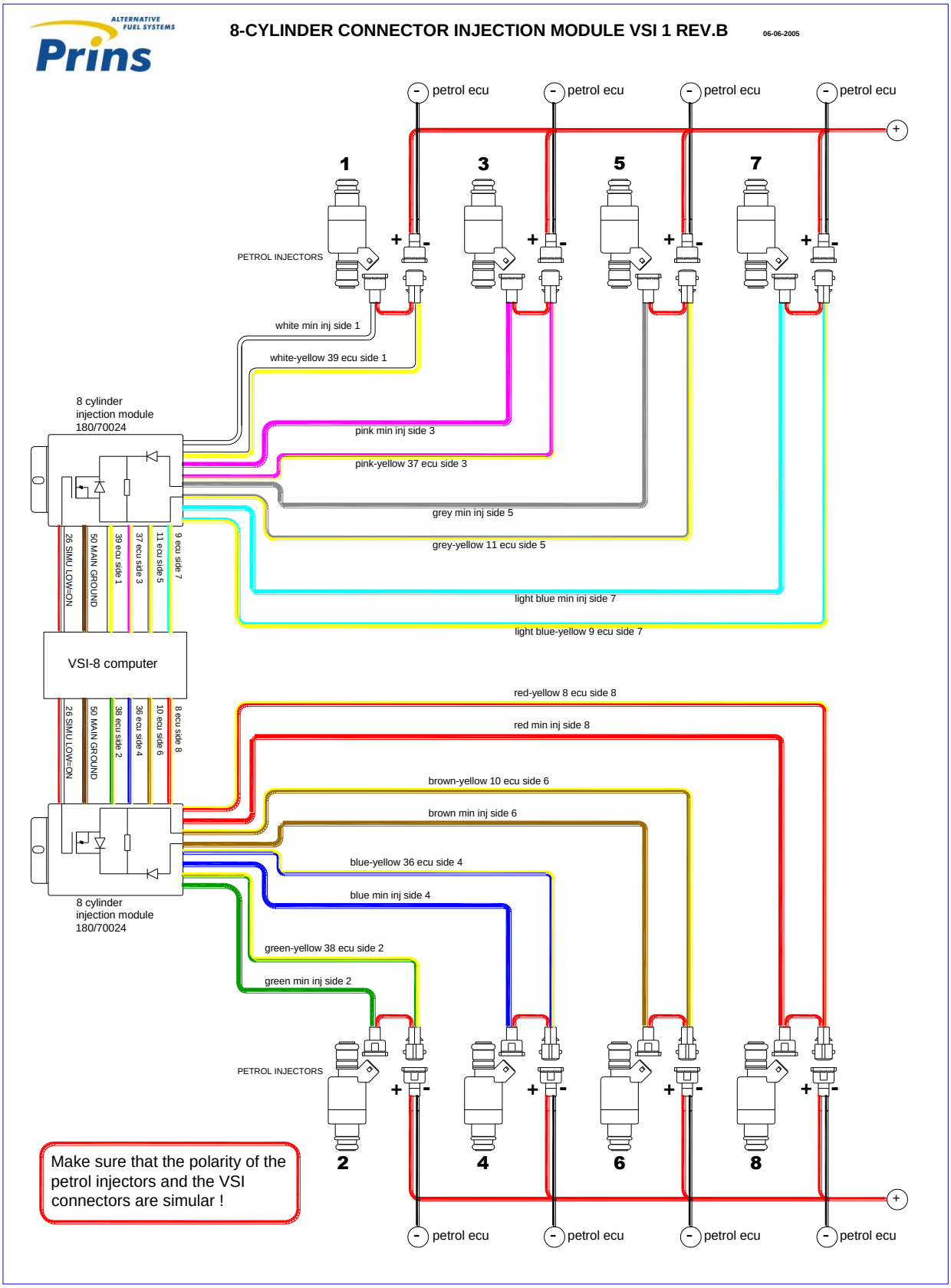


Diagram 17 Injection module 8-cylinder (180/ 70024 connector)

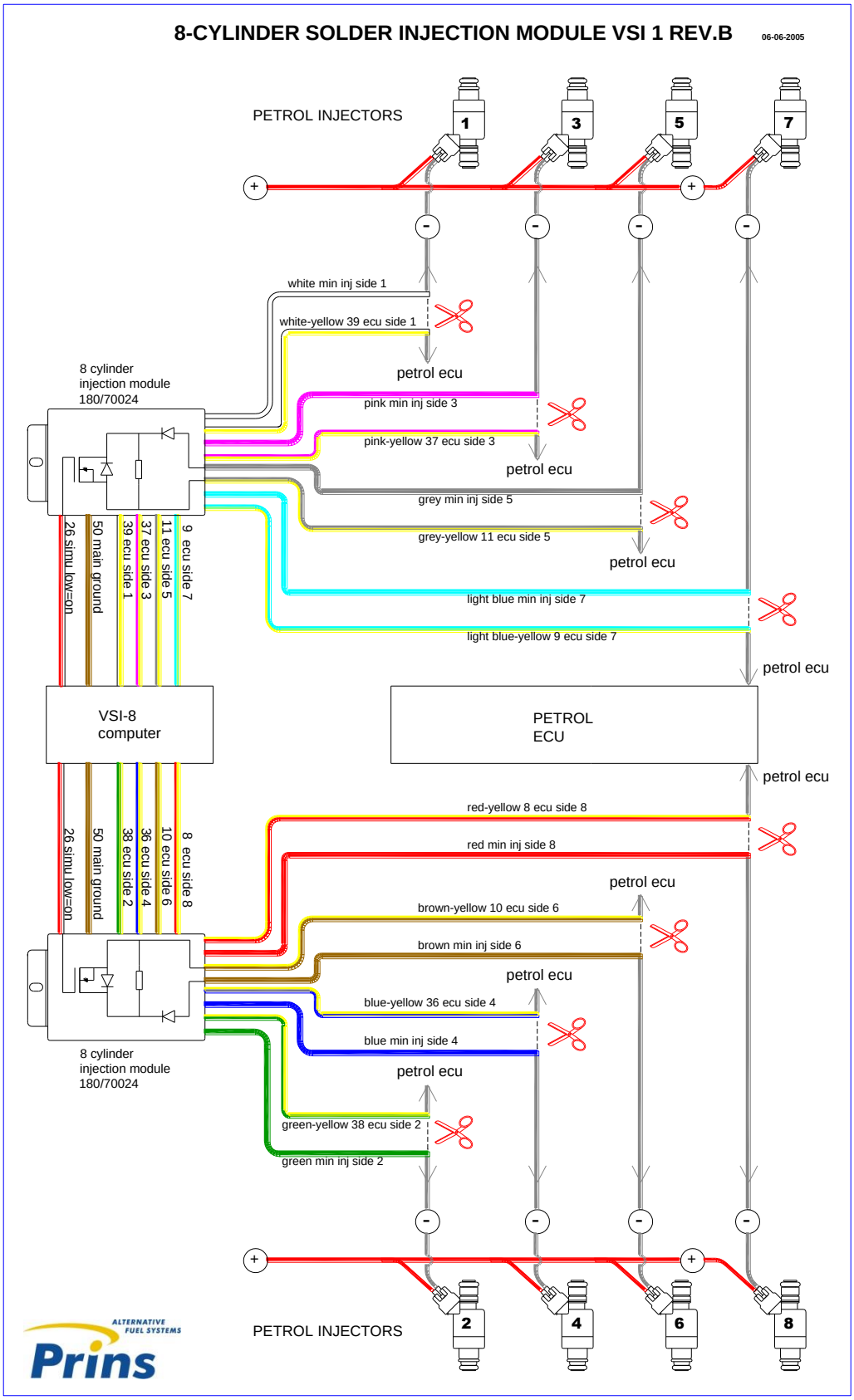


Diagram 18 Injection module 8-cylinder (180/70024 solder)

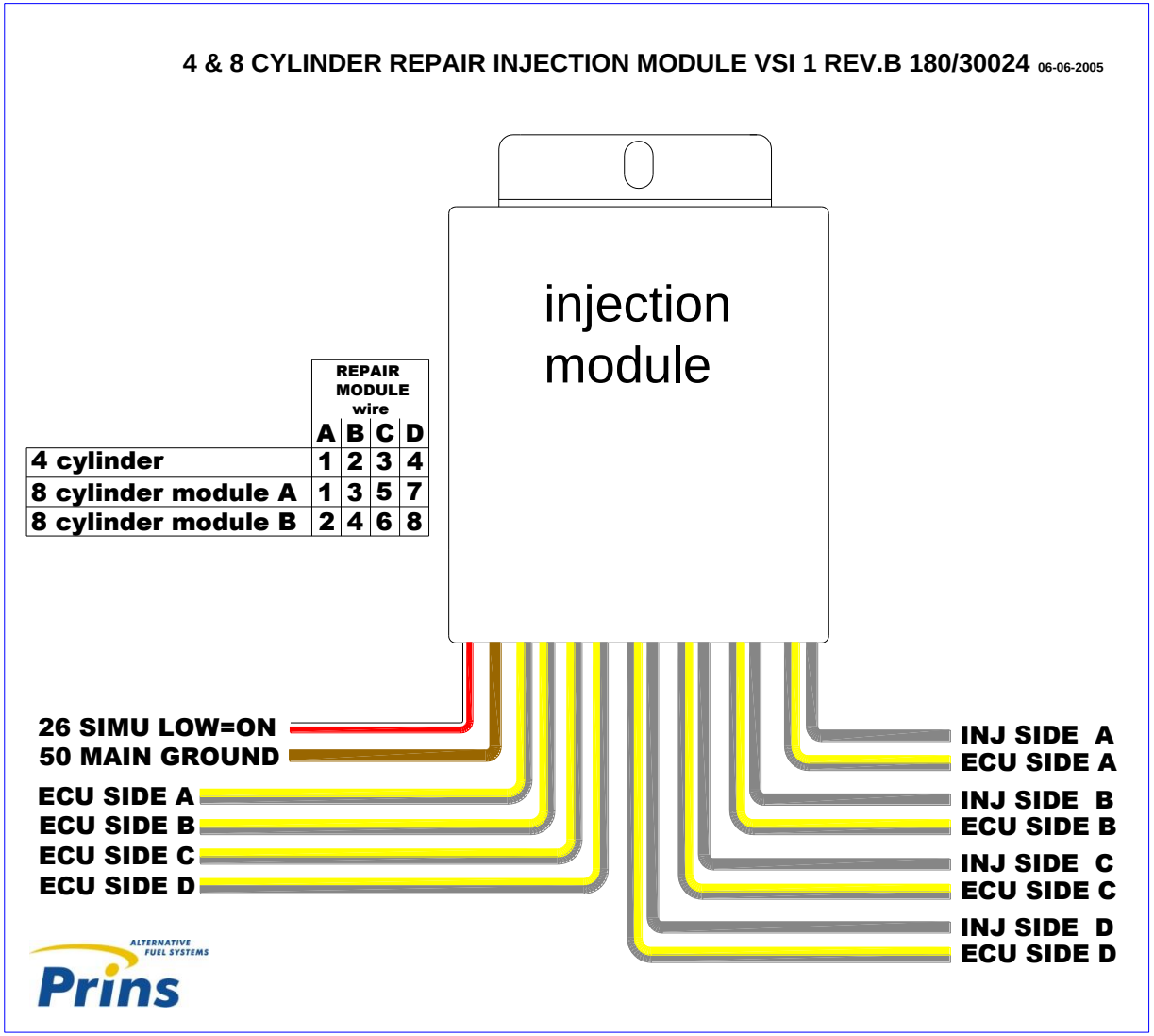
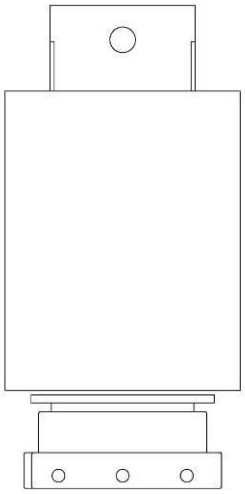
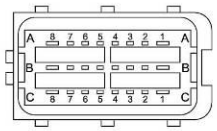
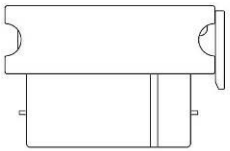


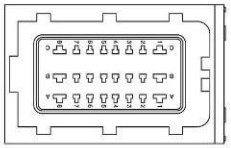
Diagram 19 Repair module 180/30024 (4-8 cylinder)



Sicma
24-pole pin header
black







Sicma
24-pole female housing
black

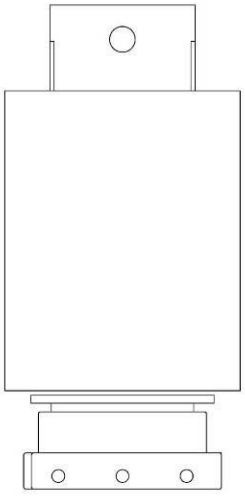
injection module 4 cylinder			
pin	connected to	wire color	print on wire
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6			
A7			
A8			
B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6			
B7			
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6			
C7			
C8	vsi ecm	brown	54 inj. mod. ground

Material:	Unit: mm	
Hardness:	Tol: ISO 2768-1:m	
Designed	T.S.	18-04-2007
Approved	W.E.	18-04-2007
Checked	W.E.	18-04-2007
Drawn	T.S.	18-04-2007
	Name	Date

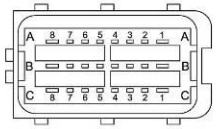
PRINS AUTOGASSYSTEMEN
EINDHOVEN–HOLLAND

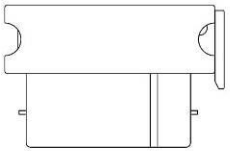
Part.No: 091/71004			
Part Name: Injection Module with connector 4 cylinder			
Scale:	Rev:	Sheet: 1/1	Size: A4

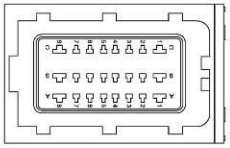
Diagram 20 connector injection module 091/71004



Sicma
24-pole pin header
black







Sicma
24-pole female housing
black

injection module 6 cylinder			
pin	connected to	wire color	print on wire
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6	vsi ecu	grey-yellow	11 ecu side 5
A7	vsi ecu	brown-yellow	10 ecu side 6
A8			
B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6	petrol ecu	grey-yellow	11 ecu side 5
B7	petrol ecu	brown-yellow	10 ecu side 6
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6	petrol injector	grey	min inj side 5
C7	petrol injector	brown	min inj side 6
C8	vsi ecm	brown	54 inj. mod. ground

Material:		Unit: mm	PRINS AUTOGASSYSTEMEN EINDHOVEN–HOLLAND	
Hardness:		Tol: ISO 2768-1:m		
Designed	T.S.	18-04-2007	Part.No: 091/71006	
Approved	W.E.	18-04-2007	Part Name: Injection Module with connector 6 cylinder	
Checked	W.E.	18-04-2007		
Drawn	T.S.	18-04-2007	Scale:	Rev: Sheet: 1/1 Size: A4
	Name	Date		

Diagram 21 injection module 091/71006

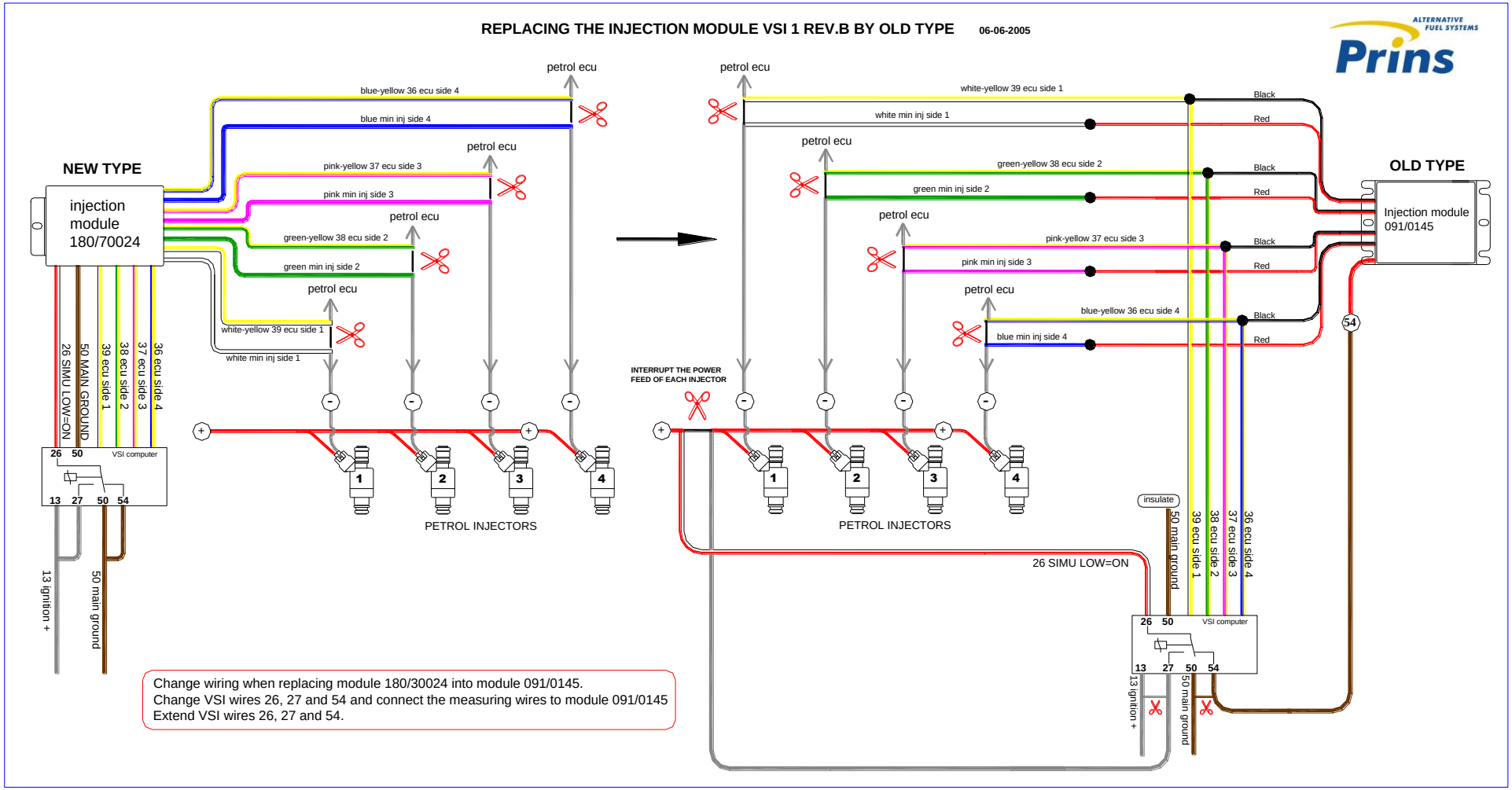
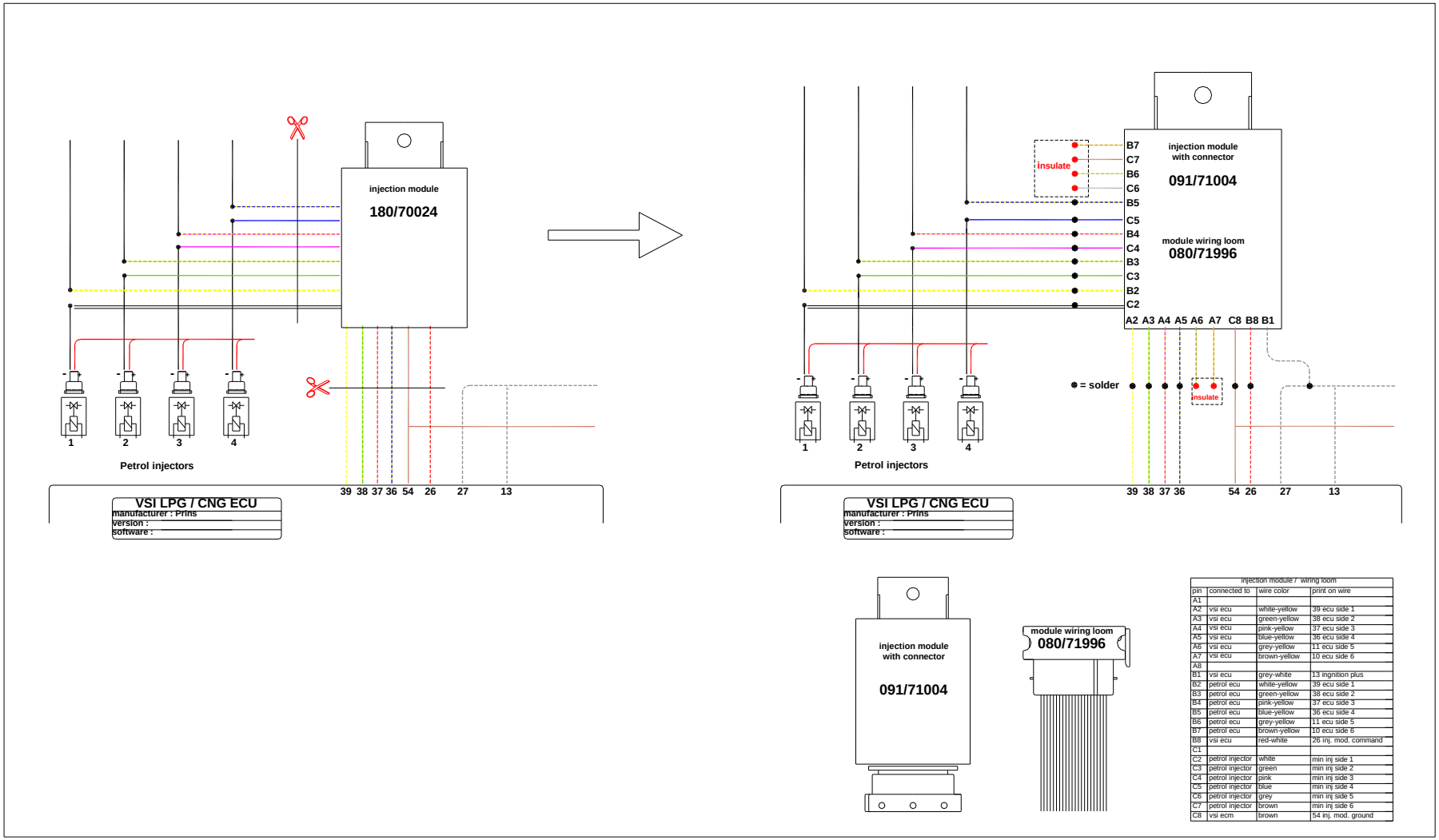


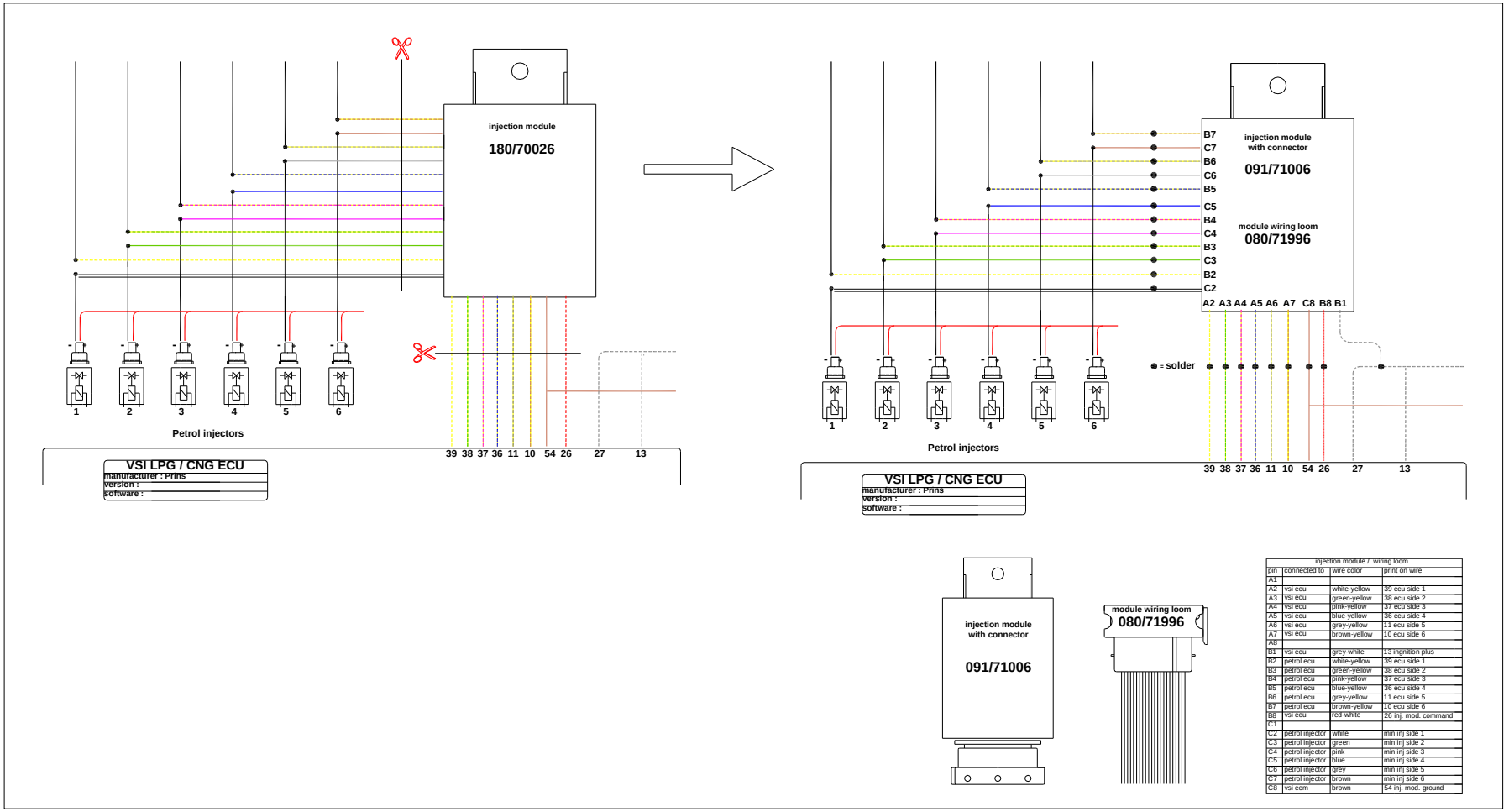
Diagram 22 Replacing the injection module 180/70024 → 091/0145



injection module / wiring loom

pin	connected to	wire color	print on wire
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6	vsi ecu	grey-yellow	11 ecu side 5
A7	vsi ecu	brown-yellow	10 ecu side 6
A8			
B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6	petrol ecu	grey-yellow	11 ecu side 5
B7	petrol ecu	brown-yellow	10 ecu side 6
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6	petrol injector	grey	min inj side 5
C7	petrol injector	brown	min inj side 6
C8	vsi ecm	brown	54 inj. mod. ground

Diagram 23 Replacing the injection module 180/70024 → 091/71004 (4 cylinder)



injection module / wiring loom

pin	connected to	wire color	print on wire
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6	vsi ecu	grey-yellow	11 ecu side 5
A7	vsi ecu	brown-yellow	10 ecu side 6
A8			
B1	vsi ecu	grey-white	13 ignition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6	petrol ecu	grey-yellow	11 ecu side 5
B7	petrol ecu	brown-yellow	10 ecu side 6
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6	petrol injector	grey	min inj side 5
C7	petrol injector	brown	min inj side 6
C8	vsi ecm	brown	54 inj. mod. ground

Diagram 24 Replacing the injection module 180/70026 → 091/71006 (6 cylinder)

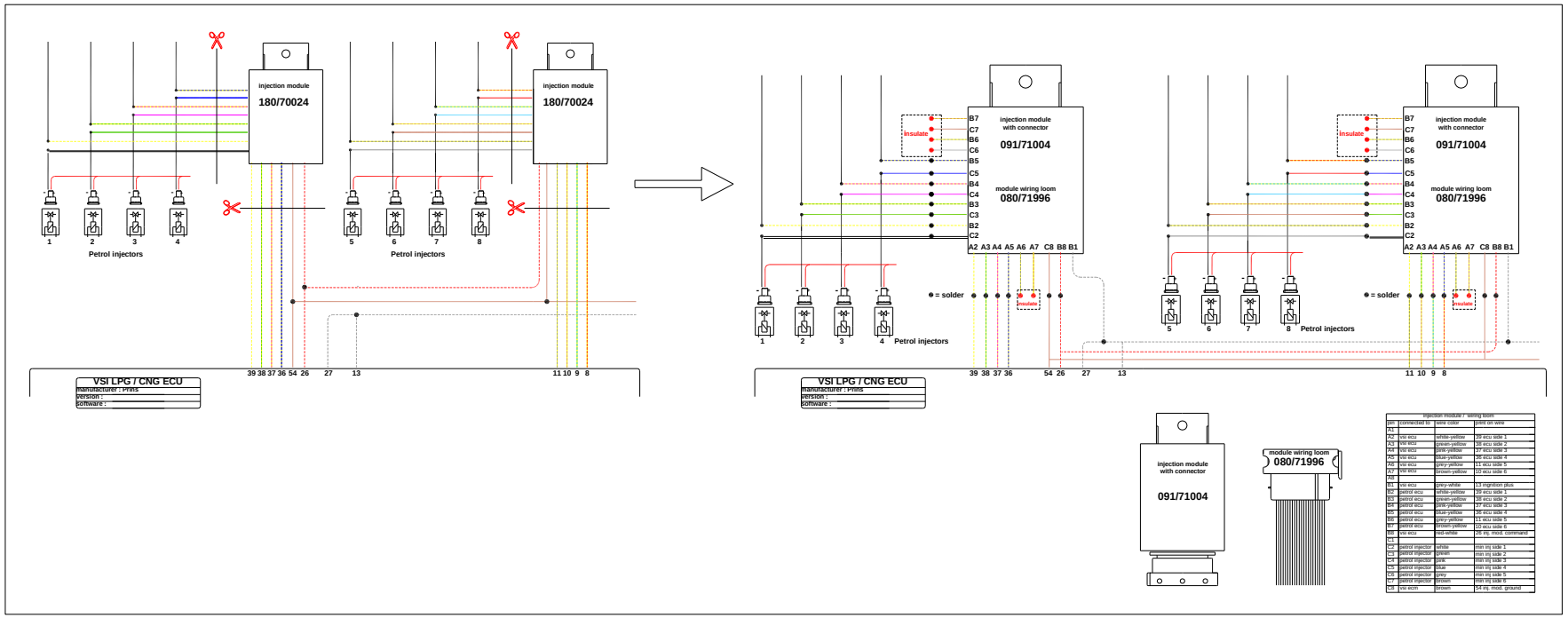
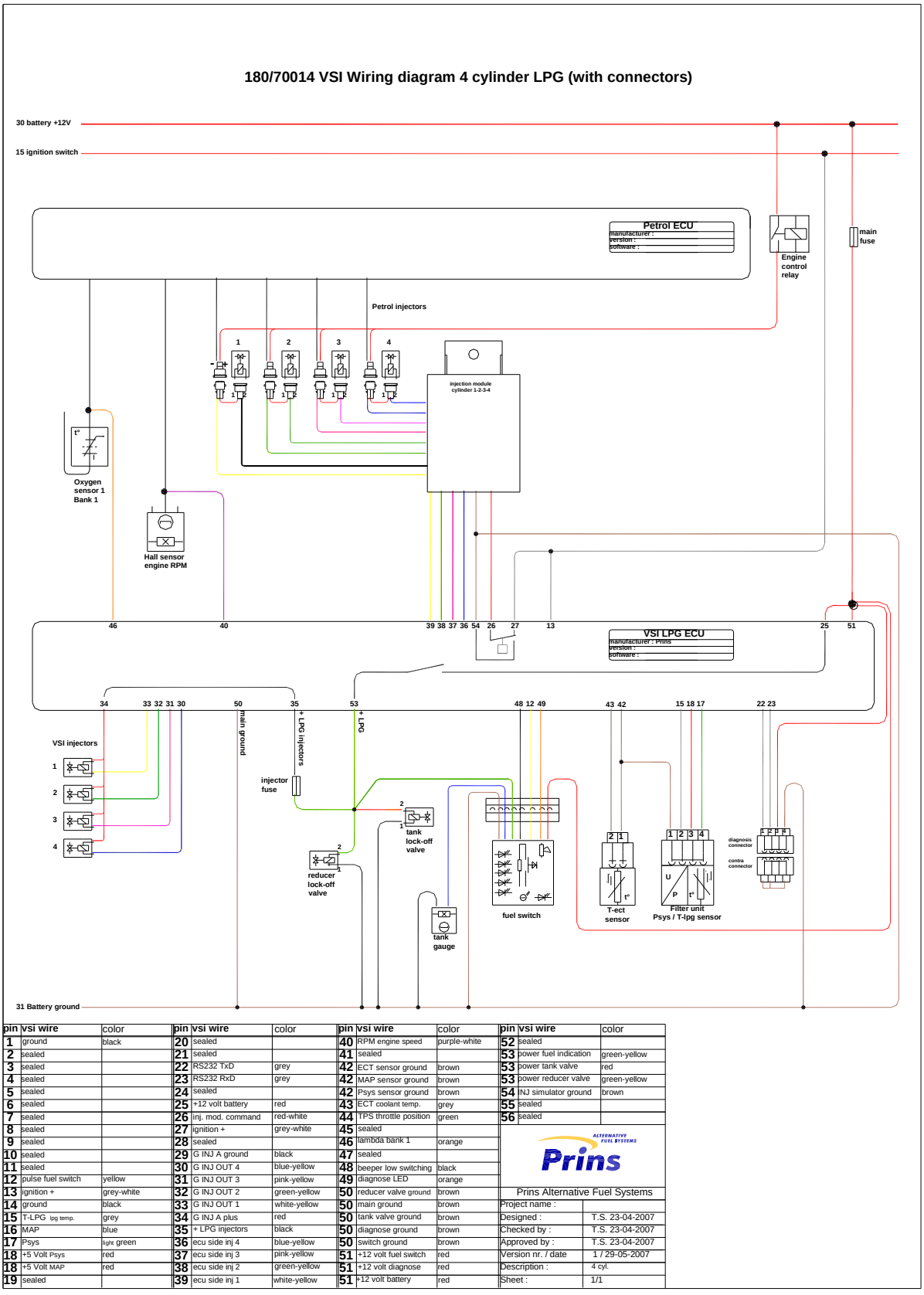


Diagram 25 Replacing the injection module 180/70024 → 091/71004 (8 cylinder)

VSI-1 Wiring diagram



pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	sealed	
5	sealed	
6	sealed	
7	sealed	
8	sealed	
9	sealed	
10	sealed	
11	sealed	
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	black
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	sealed	
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

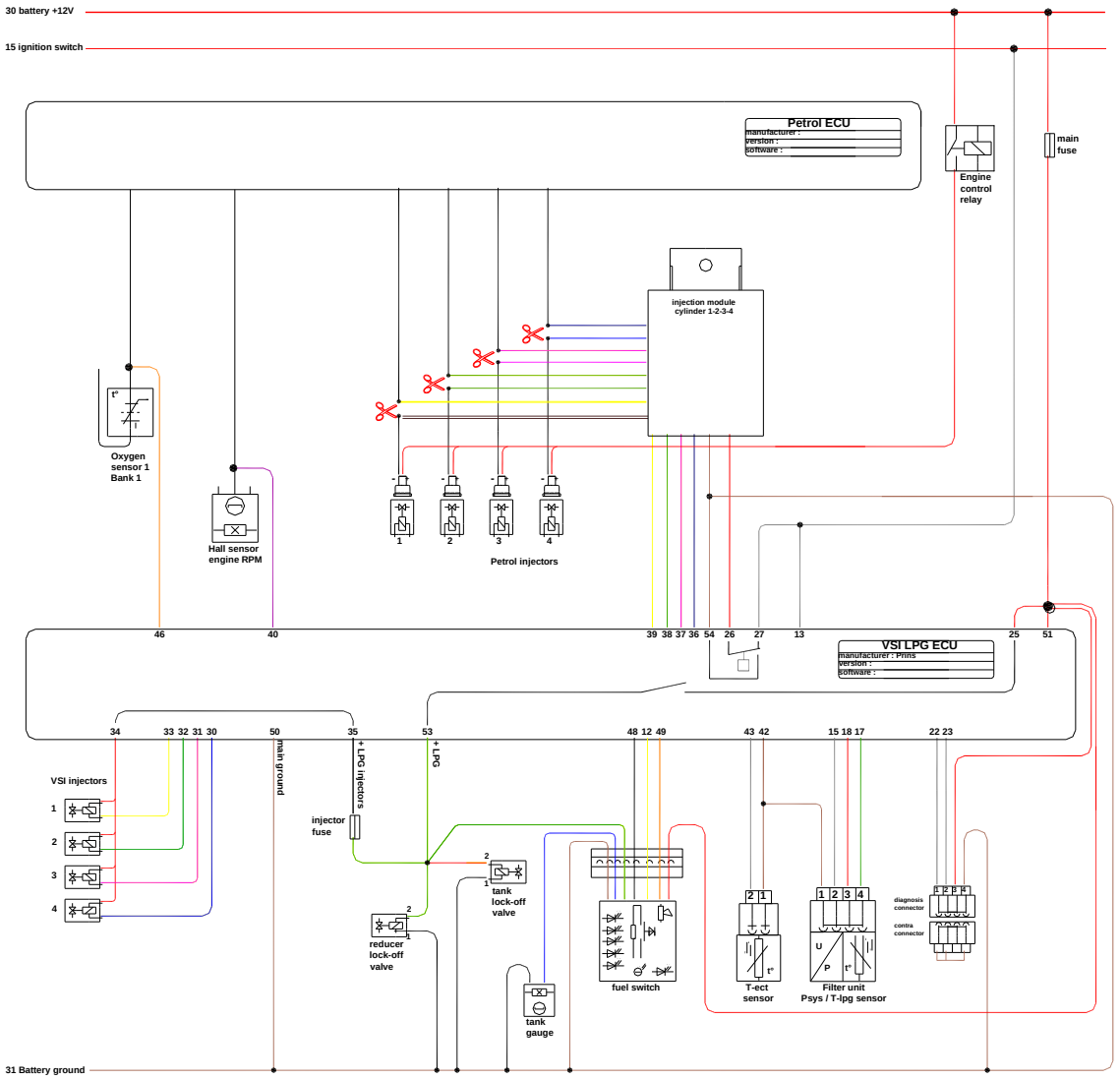
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Designed :	T.S. 23-04-2007
Checked by :	T.S. 23-04-2007
Approved by :	T.S. 23-04-2007
Version nr. / date	1 / 29-05-2007
Description :	4 cyl.
Sheet :	1/1

Diagram 26 LPG wiring 180/70014

180/70004 VSI wiring diagram 4 cylinder LPG (without connectors)



pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	sealed	
5	sealed	
6	sealed	
7	sealed	
8	sealed	
9	sealed	
10	sealed	
11	sealed	
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	black
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	sealed	
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

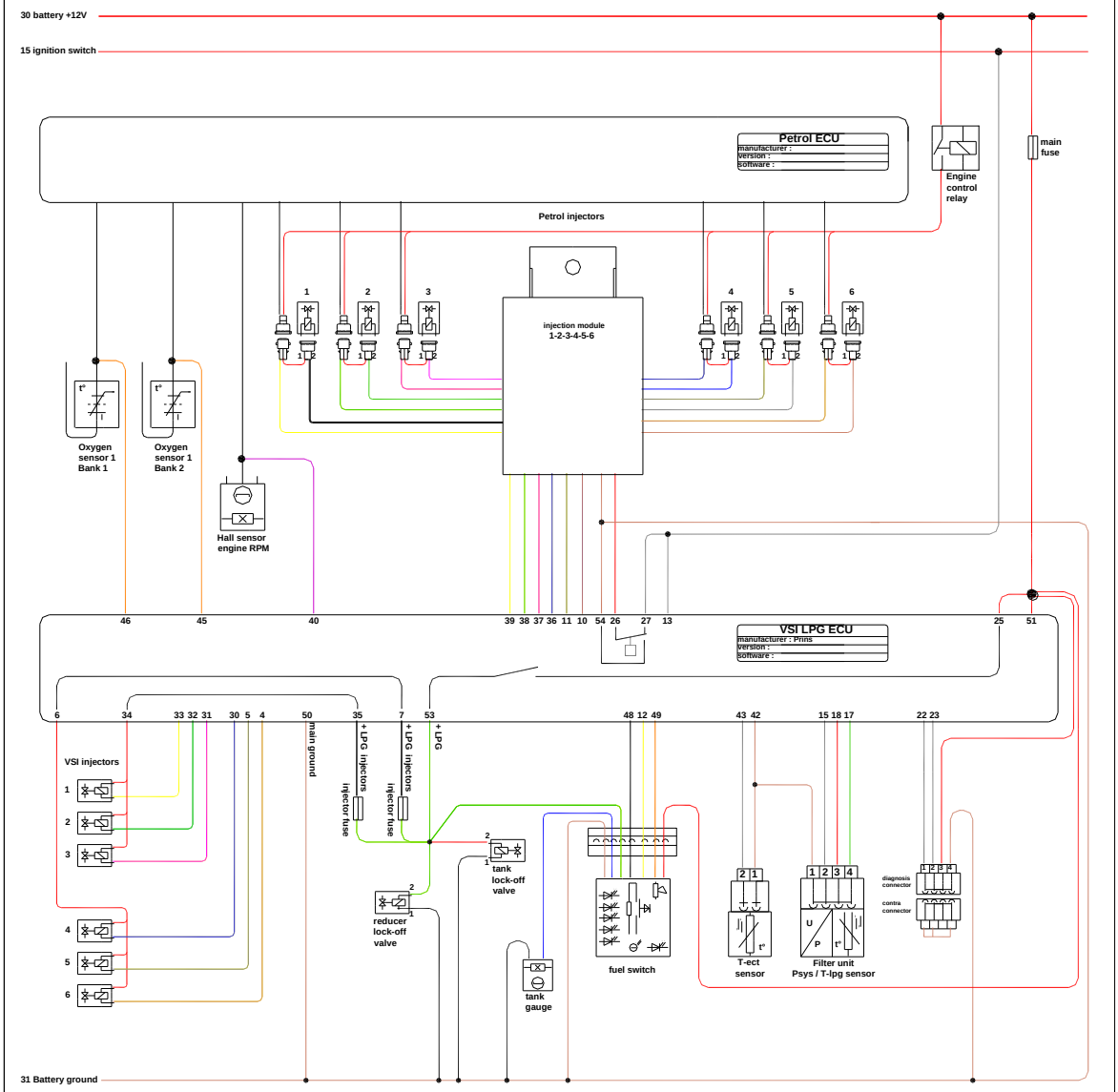
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Designed :	T.S. 23-04-2007
Checked by :	R.K. 23-04-2007
Approved by :	R.K. 23-04-2007
Version nr. / date	1 / 29-05-2007
Description :	4 cyl.without conn.
Sheet :	1/1

Diagram 27 LPG wiring 180/70004

180/70016 VSI wiring diagram 6 cylinder LPG (with connectors)



pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	black
8	sealed	
9	sealed	
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	black
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

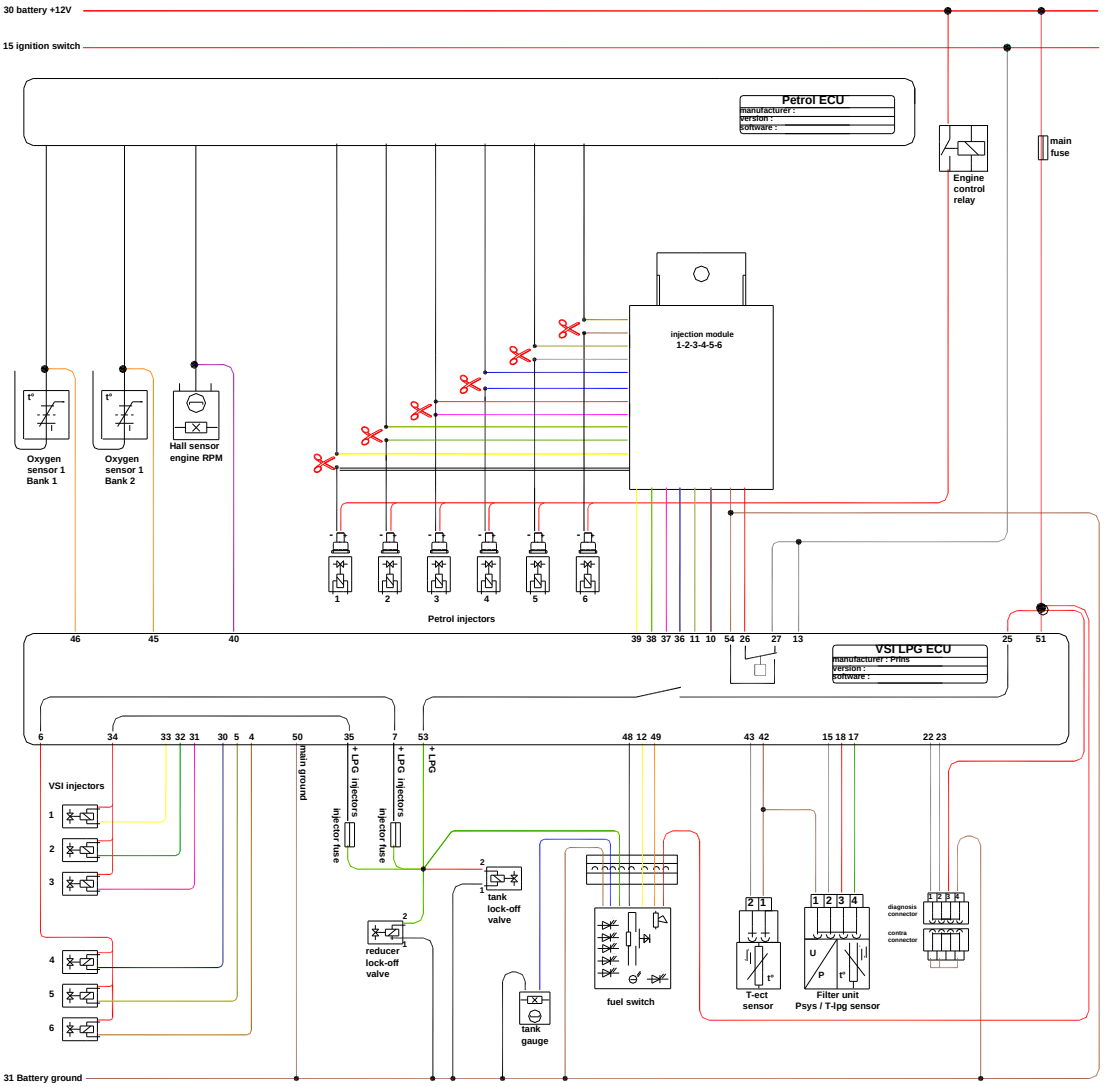
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Designed :	T.S. 23-04-2007
Checked by :	R.K. 23-04-2007
Approved by :	R.K. 23-04-2007
Version nr. / date	1 / 29-05-2007
Description :	6 cyl.with conn.
Sheet :	1/1

Diagram 28 LPG wiring 180/70016

180/70006 VSI wiring diagram 6 cylinder LPG (without connectors)



pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	black
8	sealed	
9	sealed	
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	black
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

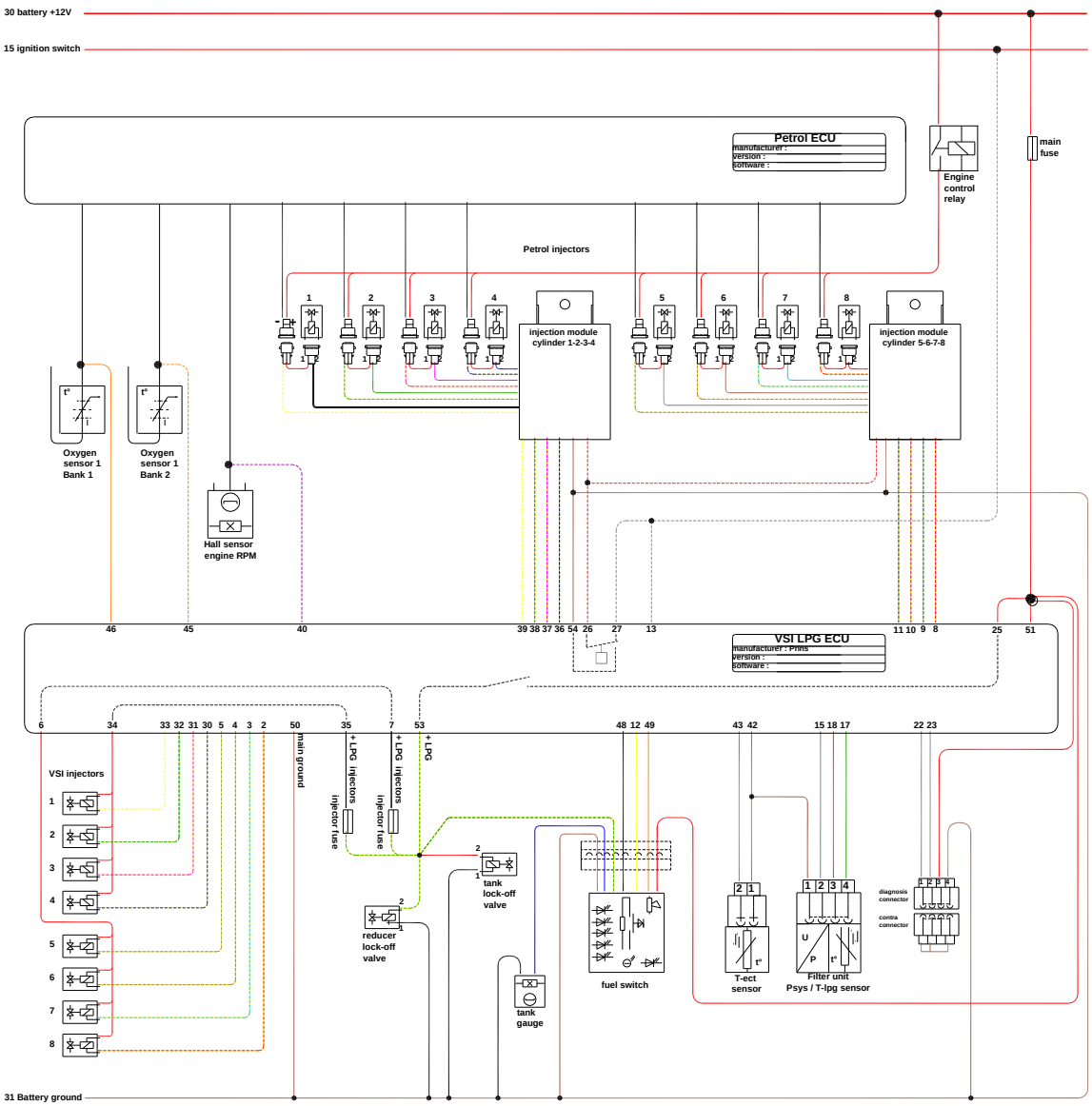
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Designed :	T.S. 23-04-2007
Checked by :	R.K. 23-04-2007
Approved by :	R.K. 23-04-2007
Version nr. / date	1 / 29-05-2007
Description :	6 cyl. without conn.
Sheet :	1/1

Diagram 29 LPG wiring 180/70006

180/70018 VSI wiring diagram 8 cylinder LPG (with connectors)



pin	vsi wire	color
1	ground	black
2	G INJ OUT 8	red-yellow
3	G INJ OUT 7	light blue-yellow
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	black
8	ecu side inj 8	red-yellow
9	ecu side inj 7	light blue-yellow
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	black
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

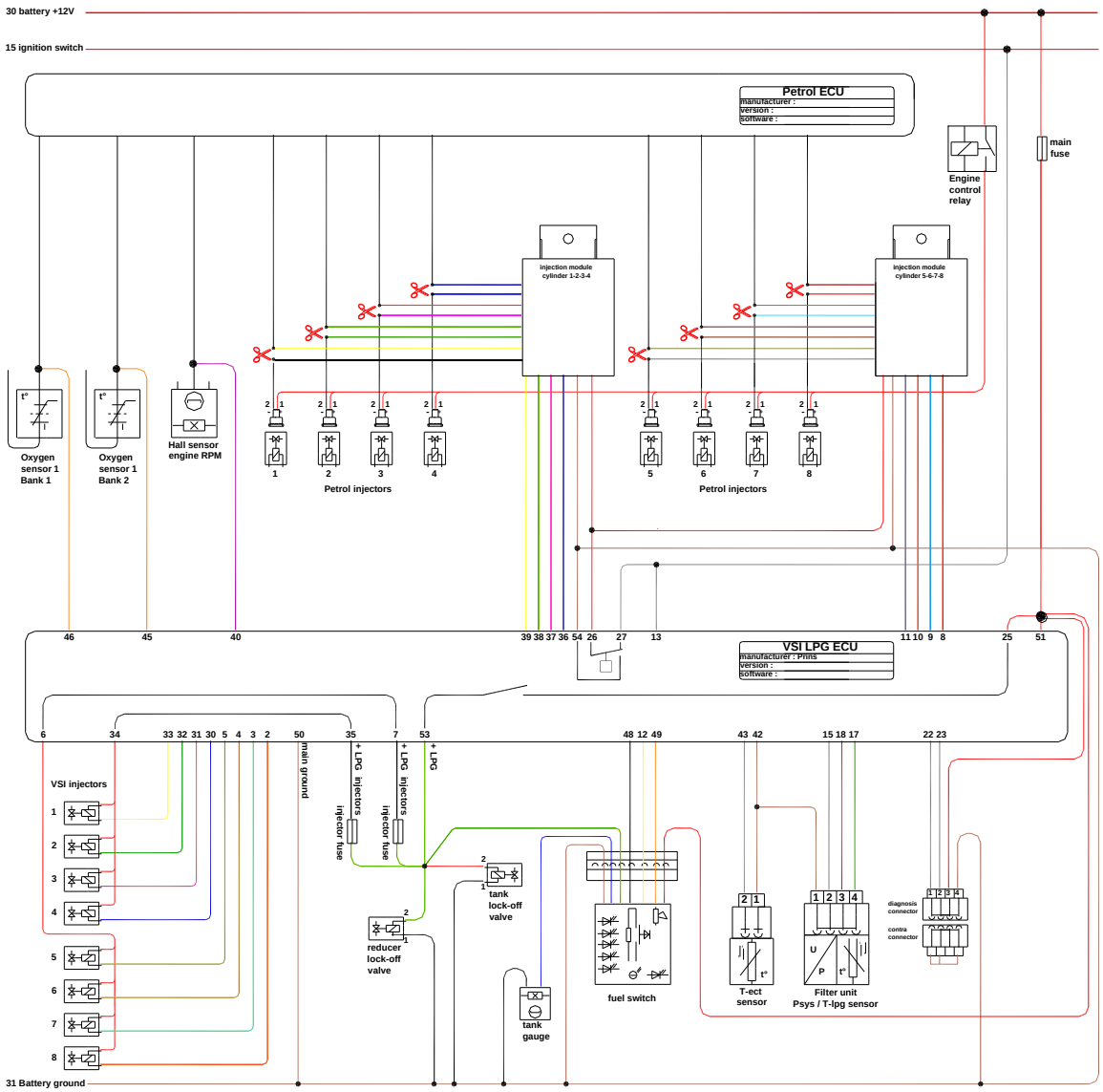
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Designed :	T.S. 23-04-2007
Checked by :	T.S. 23-04-2007
Approved by :	T.S. 23-04-2007
Version nr. / date	1 / 29-05-2007
Description :	8 cyl. with conn.
Sheet :	1/1

Diagram 30 LPG wiring 180/70018

180/70008 VSI wiring diagram 8 cylinder LPG (without connectors)



pin	vsi wire	color
1	ground	black
2	G INJ OUT 8	red-yellow
3	G INJ OUT 7	light blue-yellow
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	black
8	ecu side inj 8	red-yellow
9	ecu side inj 7	light blue-yellow
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	black
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

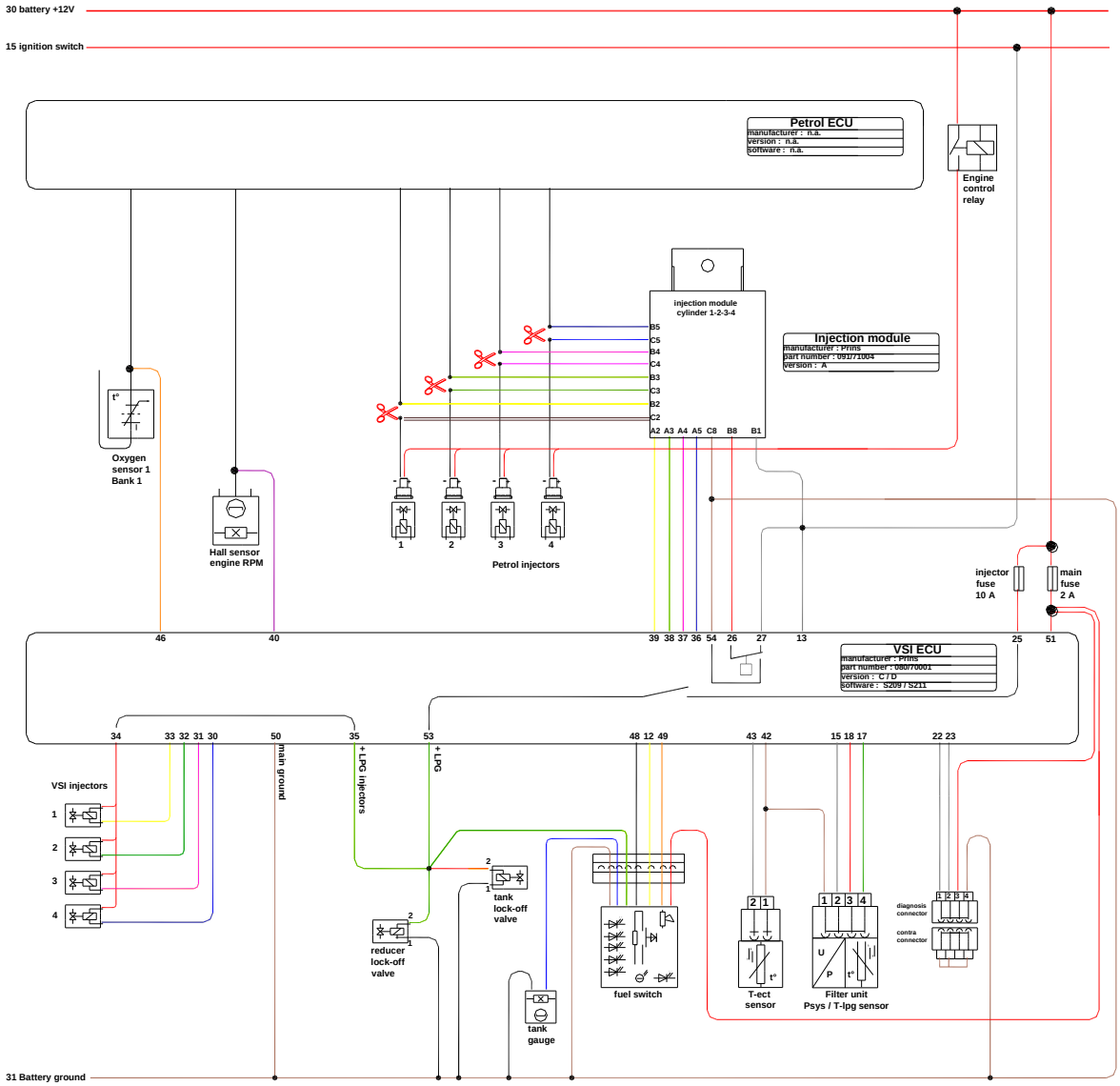
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Designed :	T.S. 23-04-2007
Checked by :	R.K. 23-04-2007
Approved by :	R.K. 23-04-2007
Version nr. / date	1 / 29-05-2007
Project name :	8 cyl. without conn.
Sheet :	1/1

Diagram 31 LPG wiring 180/70008

080/72040 VSI wiring diagram 4 cylinder LPG (without connectors)



injection module			
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6			
A7			
A8			
B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6			
B7			
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6			
C7			
C8	vsi ecm	brown	54 inj. mod. ground

pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	sealed	
5	sealed	
6	sealed	
7	sealed	
8	sealed	
9	sealed	
10	sealed	
11	sealed	
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys light	green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	green-yellow
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	sealed	
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

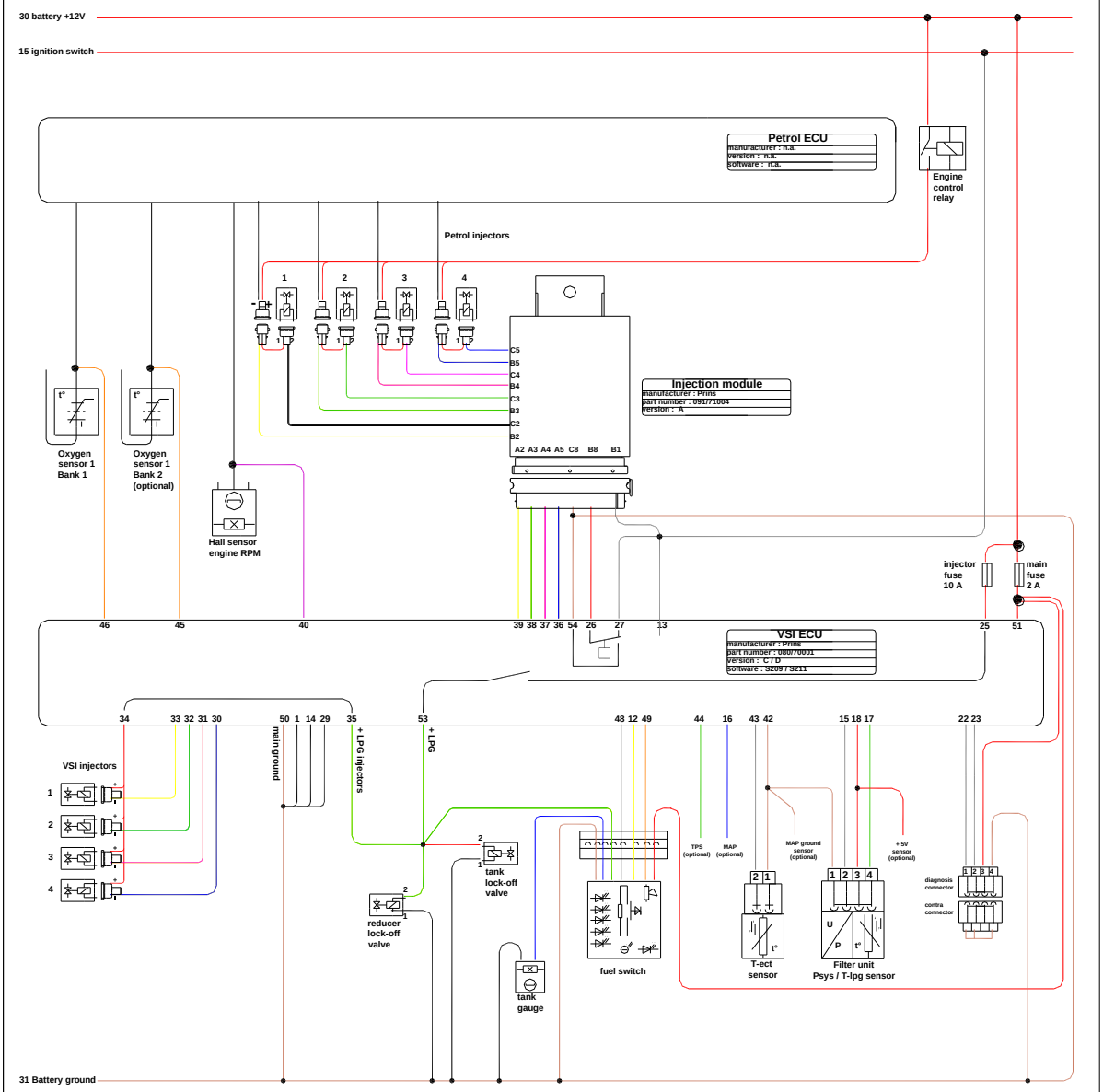
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	NJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Part nr :	080/72040
Description :	4 cyl. without conn.
Designed by / date	T.S. 23-04-2007
Checked by / date	R.K. 23-04-2007
Approved by / date	R.K. 03-07-2007
Revision by / date	
Sheet :	1/1

Diagram 32 LPG wiring 080/72040

080/72045 VSI Wiring diagram 4 cylinder LPG (with connectors)



injection module			
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6			
A7			
A8			
B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6			
B7			
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6			
C7			
C8	vsi ecm	brown	54 inj. mod. ground

pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	sealed	
5	sealed	
6	sealed	
7	sealed	
8	sealed	
9	sealed	
10	sealed	
11	sealed	
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys light green	
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	green-yellow
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

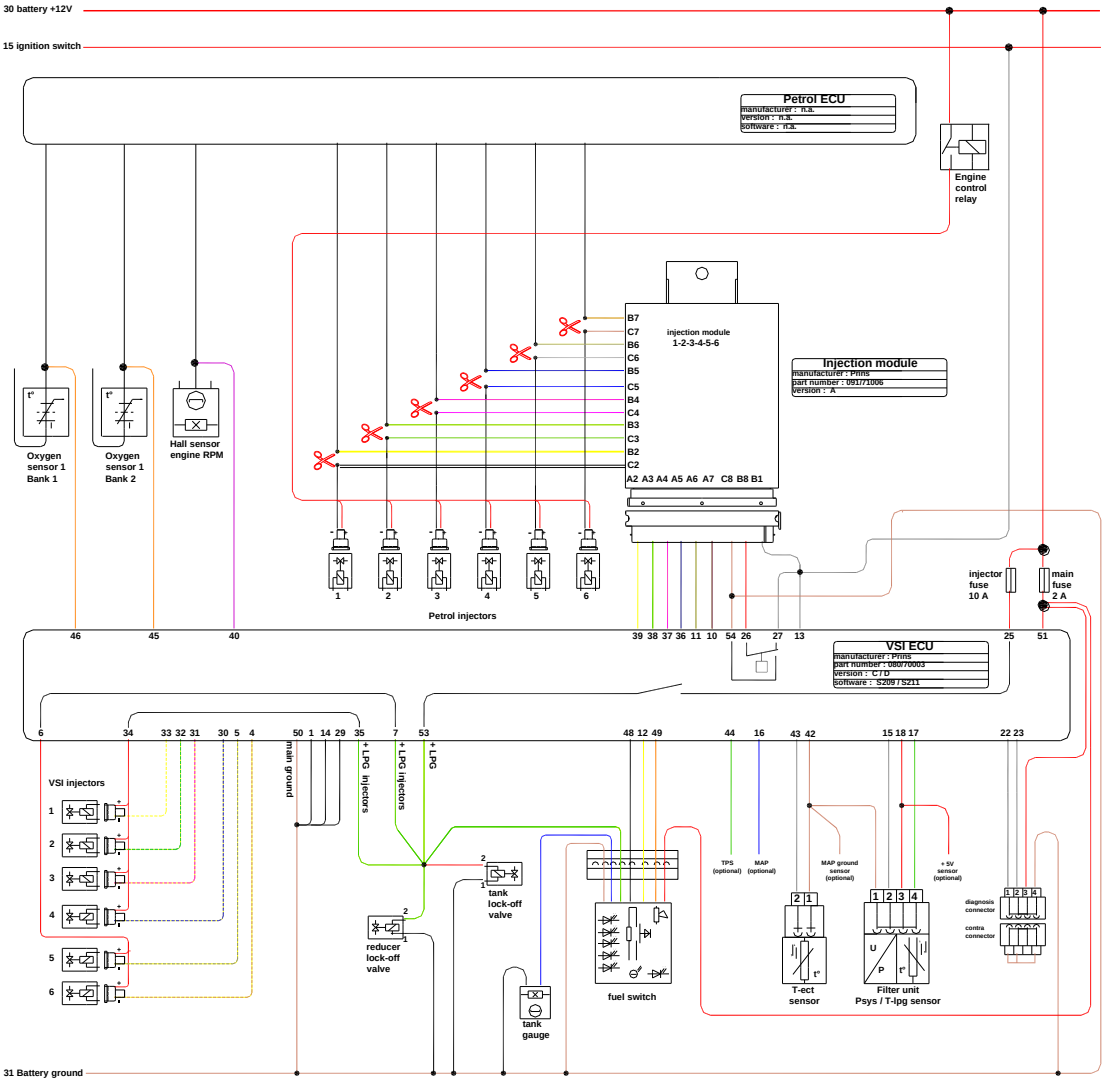
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Part nr :	080/72045
Description :	4 cyl. with conn.
Designed by/ date	TS / 23-04-07
Checked by / date	RK / 26-10-07
Approved by / date	
Revision / by / date	-1 JT / 26-10-07
Sheet :	1/1

Diagram 33 LPG wiring 080/72045

080/72050 VSI wiring diagram 6 cylinder LPG (without connectors)



		injection module	
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6	vsi ecu	grey-yellow	11 ecu side 5
A7	vsi ecu	brown-yellow	10 ecu side 6
A8			
B1	vsi ecu	grey-white	13 ignition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6	petrol ecu	grey-yellow	11 ecu side 5
B7	petrol ecu	brown-yellow	10 ecu side 6
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6	petrol injector	grey	min inj side 5
C7	petrol injector	brown	min inj side 6
C8	vsi ecm	brown	54 inj. mod. ground

pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	green-yellow
8	sealed	
9	sealed	
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys light green	
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	green-yellow
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

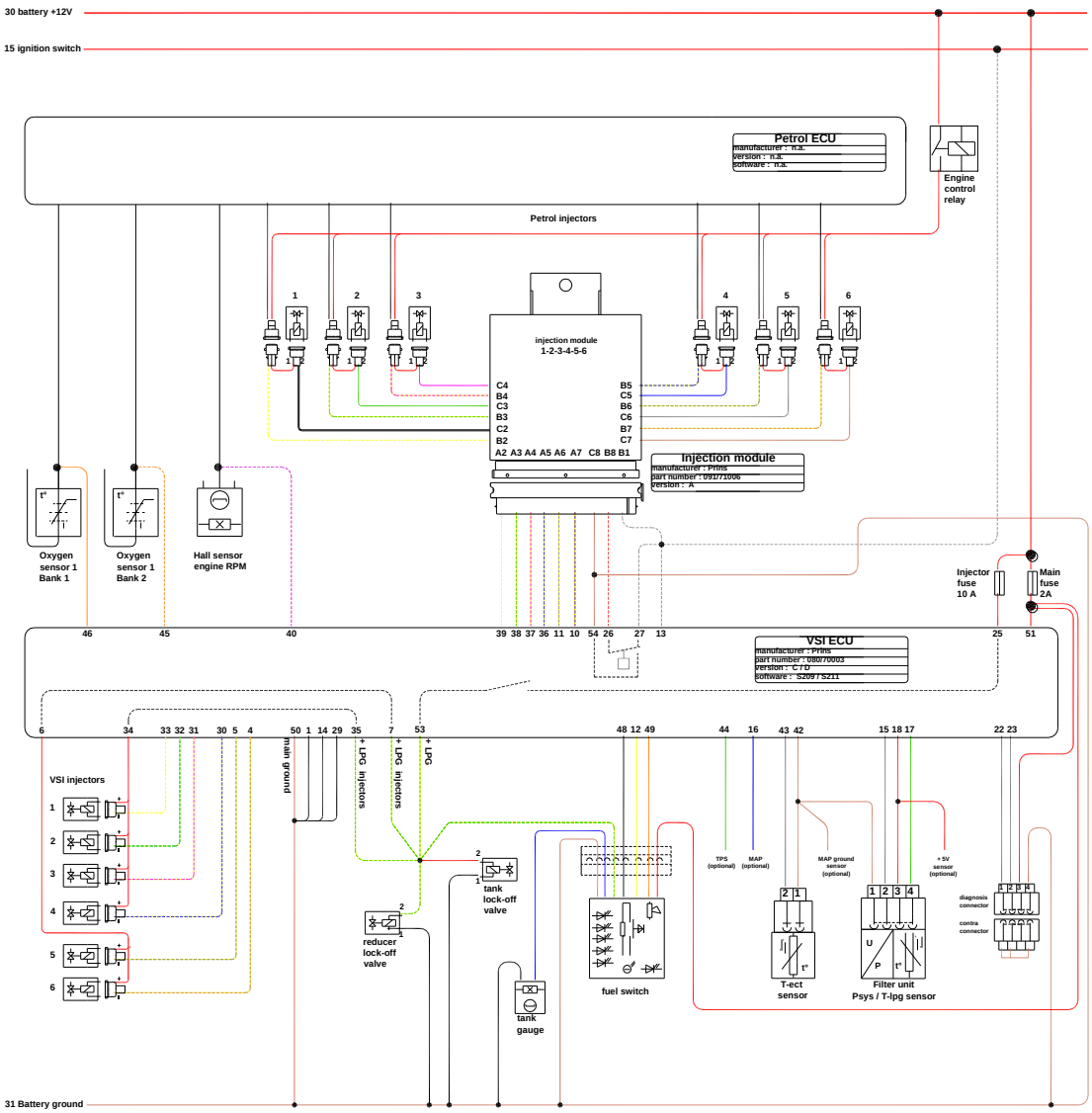
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Part nr :	080/72050
Description :	6 cyl. without conn.
Designed by / date	T.S. 23-04-07
Checked by / date	R.K. 26-10-07
Approved by / date	
Revision by / date	-1 / J.T. 26-10-07
Sheet :	1/1

Diagram 34 LPG wiring 080/72050

080/72055 VSI wiring diagram 6 cylinder LPG (with connectors)



	injection module		
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6	vsi ecu	grey-yellow	11 ecu side 5
A7	vsi ecu	brown-yellow	10 ecu side 6
A8			
B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6	petrol ecu	grey-yellow	11 ecu side 5
B7	petrol ecu	brown-yellow	10 ecu side 6
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6	petrol injector	grey	min inj side 5
C7	petrol injector	brown	min inj side 6
C8	vsi ecm	brown	54 inj. mod. ground

pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	green-yellow
8	sealed	
9	sealed	
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys light green	
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	green-yellow
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

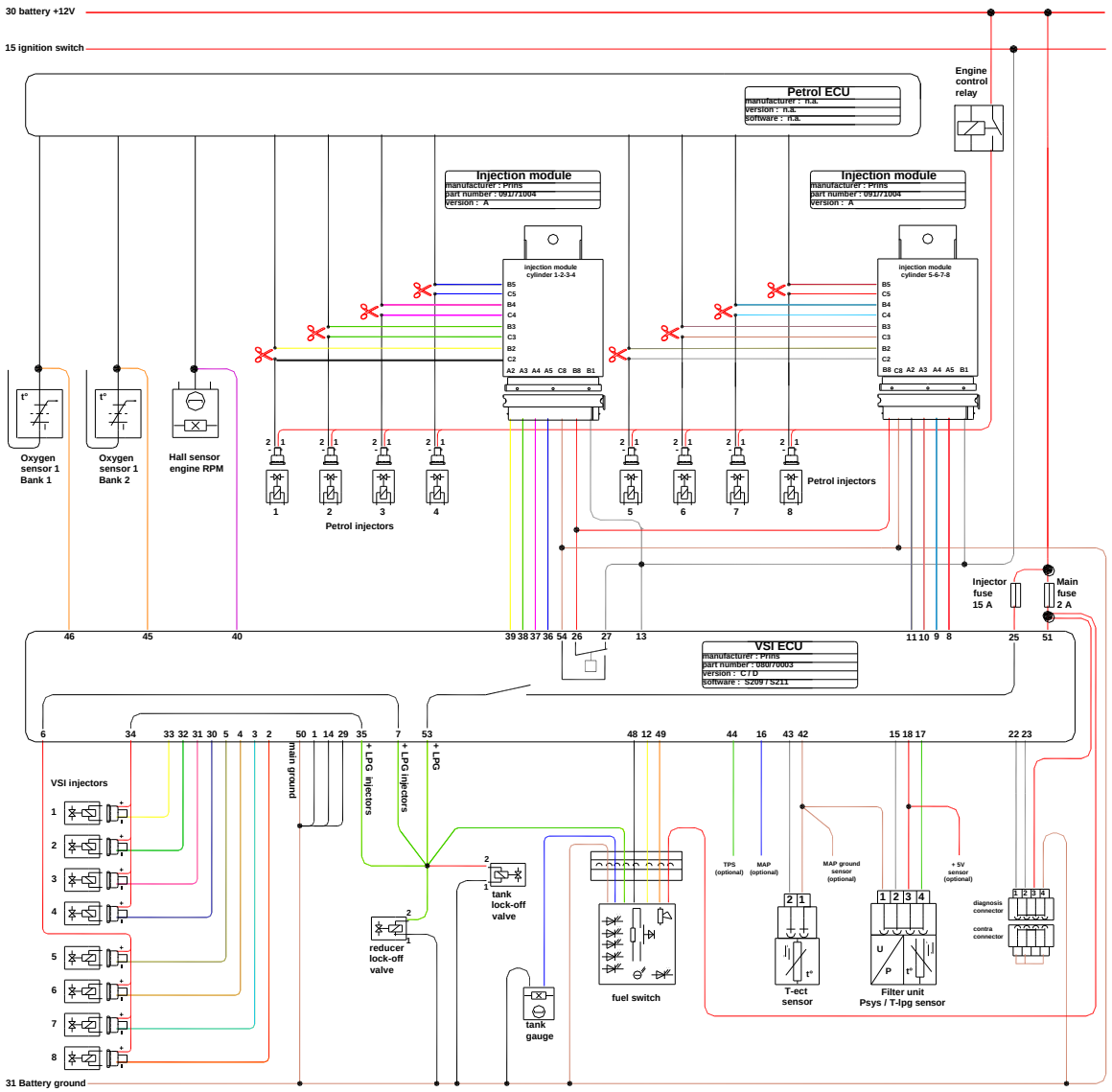
pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Part nr :	080/72055
Description :	6 cyl. with conn.
Designed by / date	T.S. 23-04-07
Checked by / date	R.K. 26-10-07
Approved by / date	
Revision by / date	-1 / J.T. 26-10-07
Sheet :	1/1

Diagram 35 LPG wiring 080/72055

080/72060 VSI wiring diagram 8 cylinder LPG (without connectors)



pin	vsi wire	color
1	ground	black
2	G INJ OUT 8	red-yellow
3	G INJ OUT 7	light blue-yellow
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	green-yellow
8	ecu side inj 8	red-yellow
9	ecu side inj 7	light blue-yellow
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG lpg temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	green-yellow
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

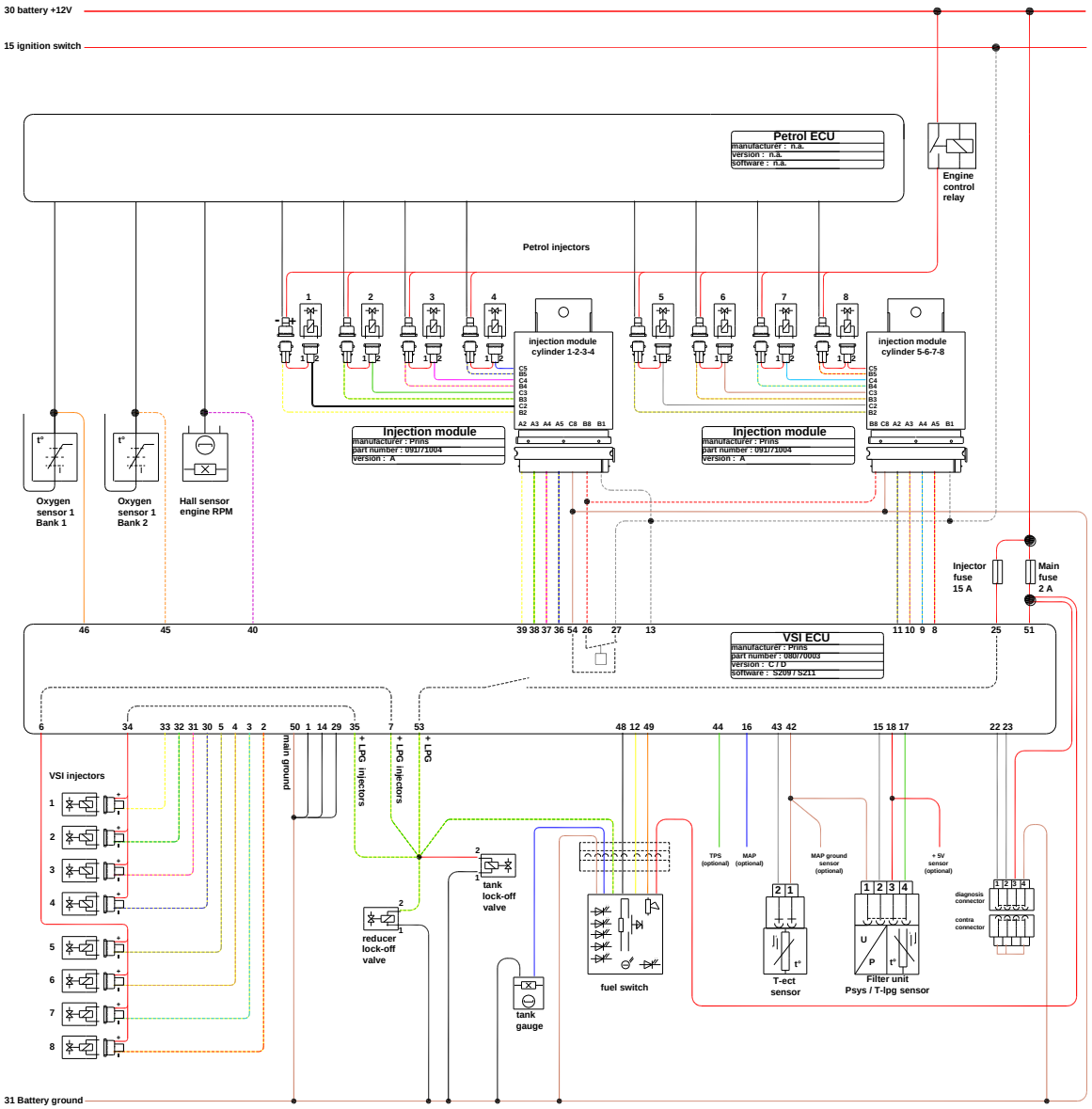
	injection module A				injection module B		
A1				A1			
A2	vsi ecu	white-yellow	39 ecu side 1	A2	vsi ecu	grey-yellow	11 ecu side 5
A3	vsi ecu	green-yellow	38 ecu side 2	A3	vsi ecu	brown-yellow	10 ecu side 6
A4	vsi ecu	pink-yellow	37 ecu side 3	A4	vsi ecu	light blue-yellow	9 ecu side 7
A5	vsi ecu	blue-yellow	36 ecu side 4	A5	vsi ecu	red-yellow	8 ecu side 8
A6				A6			
A7				A7			
A8				A8			
B1	vsi ecu	grey-white	13 ingnition plus	B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1	B2	petrol ecu	grey-yellow	11 ecu side 5
B3	petrol ecu	green-yellow	38 ecu side 2	B3	petrol ecu	brown-yellow	10 ecu side 6
B4	petrol ecu	pink-yellow	37 ecu side 3	B4	petrol ecu	light blue-yellow	9 ecu side 7
B5	petrol ecu	blue-yellow	36 ecu side 4	B5	petrol ecu	red-yellow	8 ecu side 8
B6				B6			
B7				B7			
B8	vsi ecu	red-white	26 inj. mod. command	B8	vsi ecu	red-white	26 inj. mod. command
C1				C1			
C2	petrol injector	white	min inj side 1	C2	petrol injector	grey	min inj side 5
C3	petrol injector	green	min inj side 2	C3	petrol injector	brown	min inj side 6
C4	petrol injector	pink	min inj side 3	C4	petrol injector	light blue	min inj side 7
C5	petrol injector	blue	min inj side 4	C5	petrol injector	red	min inj side 8
C6				C6			
C7				C7			
C8	vsi ecm	brown	54 inj. mod. ground	C8	vsi ecm	brown	54 inj. mod. ground

Prins Alternative Fuel Systems

Project name :	
Part nr :	080/72060
Description :	8 cyl. without conn.
Designed by / date	T.S. 23-04-07
Checked by / date	R.K. 26-10-07
Approved by / date	
Revision by / date	-1 / J.T. 26-10-07
Sheet :	1/1

Diagram 36 LPG wiring 080/72060

080/72065 VSI wiring diagram 8 cylinder LPG (with connectors)



injection module A				injection module B			
A1				A1			
A2	vsi ecu	white-yellow	39 ecu side 1	A2	vsi ecu	grey-yellow	11 ecu side 5
A3	vsi ecu	green-yellow	38 ecu side 2	A3	vsi ecu	brown-yellow	10 ecu side 6
A4	vsi ecu	pink-yellow	37 ecu side 3	A4	vsi ecu	lightblue-yellow	9 ecu side 7
A5	vsi ecu	blue-yellow	36 ecu side 4	A5	vsi ecu	red-yellow	8 ecu side 8
A6				A6			
A7				A7			
A8				A8			
B1	vsi ecu	grey-white	13 ingnition plus	B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1	B2	petrol ecu	grey-yellow	11 ecu side 5
B3	petrol ecu	green-yellow	38 ecu side 2	B3	petrol ecu	brown-yellow	10 ecu side 6
B4	petrol ecu	pink-yellow	37 ecu side 3	B4	petrol ecu	lightblue-yellow	9 ecu side 7
B5	petrol ecu	blue-yellow	36 ecu side 4	B5	petrol ecu	red-yellow	8 ecu side 8
B6				B6			
B7				B7			
B8	vsi ecu	red-white	26 inj. mod. command	B8	vsi ecu	red-white	26 inj. mod. command
C1				C1			
C2	petrol injector	white	min inj side 1	C2	petrol injector	grey	min inj side 5
C3	petrol injector	green	min inj side 2	C3	petrol injector	brown	min inj side 6
C4	petrol injector	pink	min inj side 3	C4	petrol injector	light blue	min inj side 7
C5	petrol injector	blue	min inj side 4	C5	petrol injector	red	min inj side 8
C6				C6			
C7				C7			
C8	vsi ecm	brown	54 inj. mod. ground	C8	vsi ecm	brown	54 inj. mod. ground

pin	vsi wire	color
1	ground	black
2	G INJ OUT 8	red-yellow
3	G INJ OUT 7	light blue-yellow
4	G INJ OUT 6	brown-yellow
5	G INJ OUT 5	grey-yellow
6	G INJ B plus	red
7	+ LPG injectors	green-yellow
8	ecu side inj 8	red-yellow
9	ecu side inj 7	light blue-yellow
10	ecu side inj 6	brown-yellow
11	ecu side inj 5	grey-yellow
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-LPG log temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt Psys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	inj. mod. command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	G INJ A plus	red
35	+ LPG injectors	green-yellow
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	Psys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	reducer valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power reducer valve	green-yellow
54	INJ simulator ground	brown
55	sealed	
56	sealed	

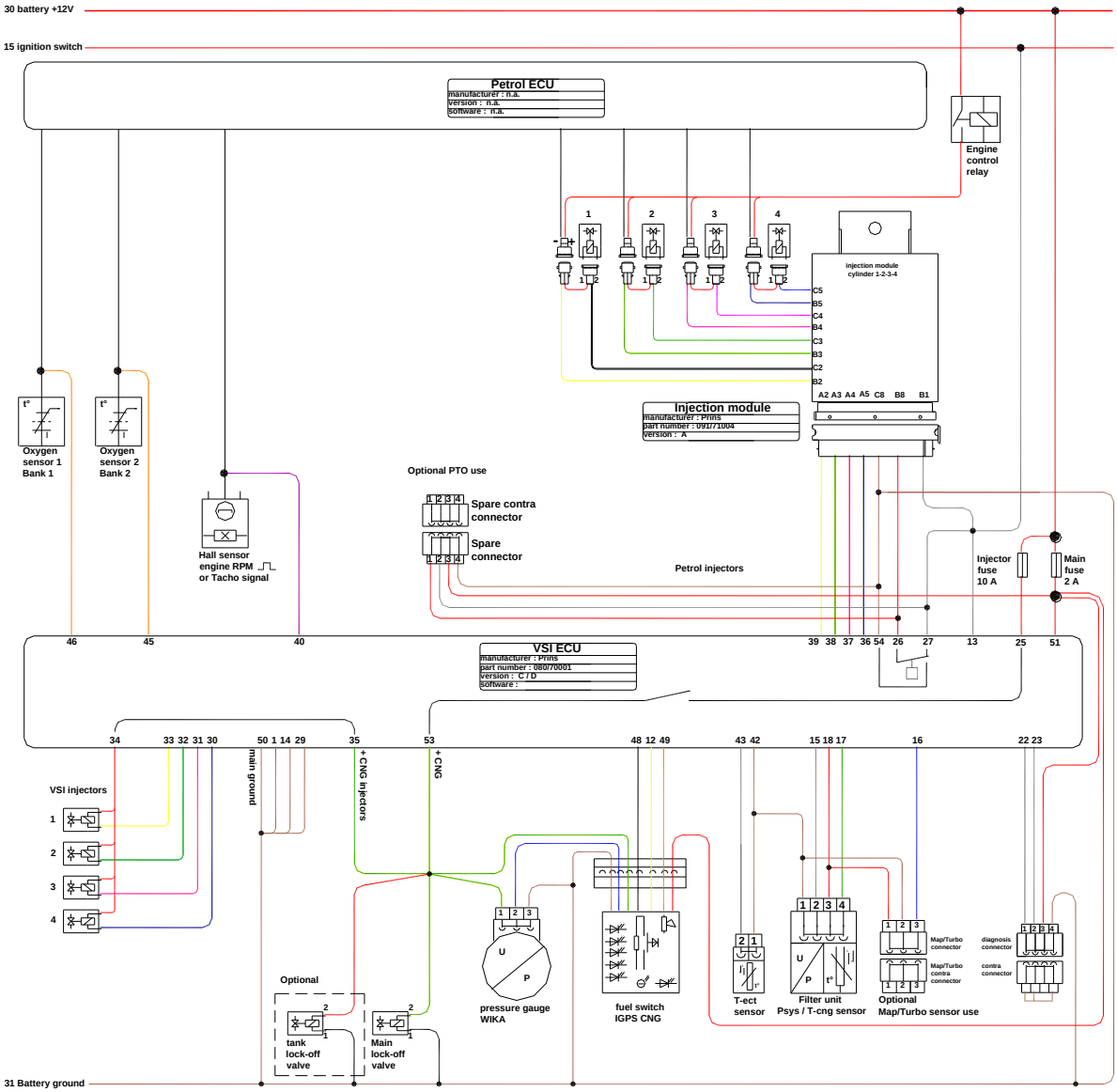
Prins Alternative Fuel Systems

Project name :	
Part nr :	080/72065
Description :	8 cyl. with conn.
Designed by / date	T.S. 23-04-07
Checked by / date	R.K. 26-10-07
Approved by / date	
Revision by / date	-1 / J.T. 26-10-07
Sheet :	1/1

Diagram 37 LPG wiring 080/72065

095/72045

CNG Wiring diagram 4 cylinder connector CNG



injection module			
A1			
A2	vsi ecu	white-yellow	39 ecu side 1
A3	vsi ecu	green-yellow	38 ecu side 2
A4	vsi ecu	pink-yellow	37 ecu side 3
A5	vsi ecu	blue-yellow	36 ecu side 4
A6			
A7			
A8			
B1	vsi ecu	grey-white	13 ingnition plus
B2	petrol ecu	white-yellow	39 ecu side 1
B3	petrol ecu	green-yellow	38 ecu side 2
B4	petrol ecu	pink-yellow	37 ecu side 3
B5	petrol ecu	blue-yellow	36 ecu side 4
B6			
B7			
B8	vsi ecu	red-white	26 inj. mod. command
C1			
C2	petrol injector	white	min inj side 1
C3	petrol injector	green	min inj side 2
C4	petrol injector	pink	min inj side 3
C5	petrol injector	blue	min inj side 4
C6			
C7			
C8	vsi ecm	brown	54 inj. mod. ground

pin	vsi wire	color
1	ground	black
2	sealed	
3	sealed	
4	sealed	
5	sealed	
6	sealed	
7	sealed	
8	sealed	
9	sealed	
10	sealed	
11	sealed	
12	pulse fuel switch	yellow
13	ignition +	grey-white
14	ground	black
15	T-Gas cng temp.	grey
16	MAP	blue
17	Psys	light green
18	+5 Volt P/T sys	red
18	+5 Volt MAP	red
19	sealed	

pin	vsi wire	color
20	sealed	
21	sealed	
22	RS232 TxD	grey
23	RS232 RxD	grey
24	sealed	
25	+12 volt battery	red
26	26 Inj. mod.command	red-white
27	ignition +	grey-white
28	sealed	
29	G INJ A ground	black
30	G INJ OUT 4	blue-yellow
31	G INJ OUT 3	pink-yellow
32	G INJ OUT 2	green-yellow
33	G INJ OUT 1	white-yellow
34	+ G INJ A OUT	red
35	+ G INJ A IN	green-yellow
36	ecu side inj 4	blue-yellow
37	ecu side inj 3	pink-yellow
38	ecu side inj 2	green-yellow
39	ecu side inj 1	white-yellow

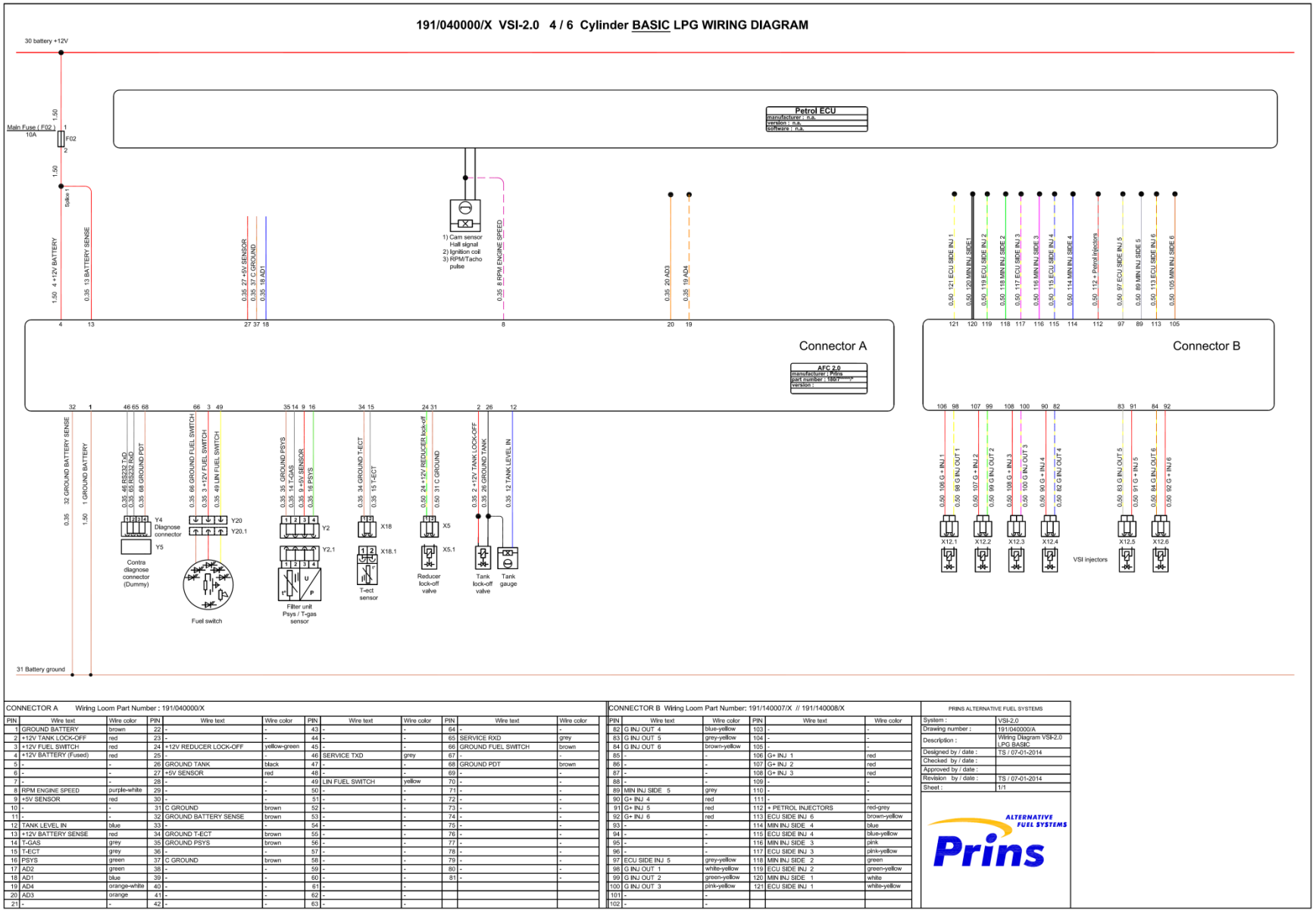
pin	vsi wire	color
40	RPM engine speed	purple-white
41	sealed	
42	ECT sensor ground	brown
42	MAP sensor ground	brown
42	P/Tsys sensor ground	brown
43	ECT coolant temp.	grey
44	TPS throttle position	green
45	lambda bank 2	orange-white
46	lambda bank 1	orange
47	sealed	
48	beeper low switching	black
49	diagnose LED	orange
50	main valve ground	brown
50	main ground	brown
50	tank valve ground	brown
50	diagnose ground	brown
50	switch ground	brown
51	+12 volt fuel switch	red
51	+12 volt diagnose	red
51	+12 volt battery	red

pin	vsi wire	color
52	sealed	
53	power fuel indication	green-yellow
53	power tank valve	red
53	power main valve	green-yellow
54	INJ module ground	brown
55	sealed	
56	sealed	

Prins Alternative Fuel Systems

Project name :	
Part nr :	095/72045
Description :	CNG 4 cyl. conn.
Designed by/ date	JT / 18-09-07
Checked by / date	
Approved by / date	
Revision / by / date	
Sheet :	1/1

Diagram 38 CNG wiring 095/72045



CONNECTOR A Wiring Loom Part Number : 191/040000/X

PIN	Wire text	Wire color	PIN	Wire text	Wire color	PIN	Wire text	Wire color	PIN	Wire text	Wire color
1	GROUND BATTERY	brown	22	-	-	43	-	-	64	-	-
2	+12V TANK LOCK-OFF	red	23	-	-	44	-	-	65	SERVICE RXD	grey
3	+12V FUEL SWITCH	red	24	+12V REDUCER LOCK-OFF	yellow-green	45	-	-	66	GROUND FUEL SWITCH	brown
4	+12V BATTERY (Fused)	red	25	-	-	46	SERVICE TXD	grey	67	-	-
5	-	-	26	GROUND TANK	black	47	-	-	68	GROUND PDT	brown
6	-	-	27	+5V SENSOR	red	48	-	-	69	-	-
7	-	-	28	-	-	49	LIN FUEL SWITCH	yellow	70	-	-
8	RPM ENGINE SPEED	purple-white	29	-	-	50	-	-	71	-	-
9	+5V SENSOR	red	30	-	-	51	-	-	72	-	-
10	-	-	31	C GROUND	brown	52	-	-	73	-	-
11	-	-	32	GROUND BATTERY SENSE	brown	53	-	-	74	-	-
12	TANK LEVEL IN	blue	33	-	-	54	-	-	75	-	-
13	+12V BATTERY SENSE	red	34	GROUND T-ECT	brown	55	-	-	76	-	-
14	T-GAS	grey	35	GROUND PSYS	brown	56	-	-	77	-	-
15	T-ECT	grey	36	-	-	57	-	-	78	-	-
16	PSYS	green	37	C GROUND	brown	58	-	-	79	-	-
17	AD2	green	38	-	-	59	-	-	80	-	-
18	AD1	blue	39	-	-	60	-	-	81	-	-
19	AD4	orange-white	40	-	-	61	-	-			
20	AD3	orange	41	-	-	62	-	-			
21	-	-	42	-	-	63	-	-			

CONNECTOR B Wiring Loom Part Number: 191/140007/X // 191/140008/X

PIN	Wire text	Wire color	PIN	Wire text	Wire color
82	G INJ OUT 4	blue-yellow	103	-	-
83	G INJ OUT 5	grey-yellow	104	-	-
84	G INJ OUT 6	brown-yellow	105	-	-
85	-	-	106	G+ INJ 1	red
86	-	-	107	G+ INJ 2	red
87	-	-	108	G+ INJ 3	red
88	-	-	109	-	-
89	MIN INJ SIDE 5	grey	110	-	-
90	G+ INJ 4	red	111	-	-
91	G+ INJ 5	red	112	+ PETROL INJECTORS	red-grey
92	G+ INJ 6	red	113	ECU SIDE INJ 6	brown-yellow
93	-	-	114	MIN INJ SIDE 4	blue
94	-	-	115	ECU SIDE INJ 4	blue-yellow
95	-	-	116	MIN INJ SIDE 3	pink
96	-	-	117	ECU SIDE INJ 3	pink-yellow
97	ECU SIDE INJ 5	grey-yellow	118	MIN INJ SIDE 2	green
98	G INJ OUT 1	white-yellow	119	ECU SIDE INJ 2	green-yellow
99	G INJ OUT 2	green-yellow	120	MIN INJ SIDE 1	white
100	G INJ OUT 3	pink-yellow	121	ECU SIDE INJ 1	white-yellow
101	-	-			
102	-	-			

PRINS ALTERNATIVE FUEL SYSTEMS

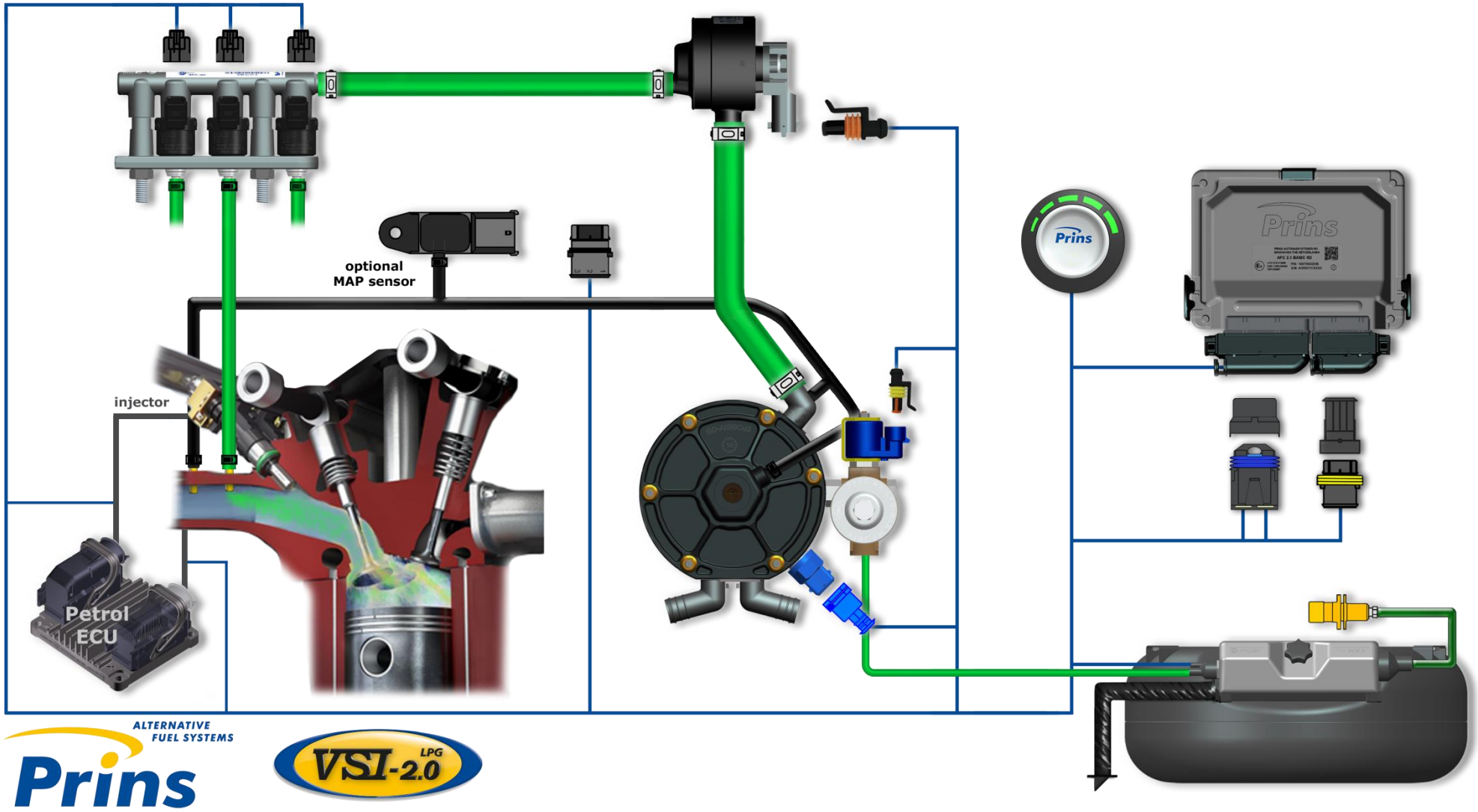
System :	VSI-2.0
Drawing number :	191/040000/A
Description :	Wiring Diagram VSI-2.0 LPG BASIC
Designed by / date :	TS / 07-01-2014
Checked by / date :	
Approved by / date :	
Revision by / date :	TS / 07-01-2014
Sheet :	1/1

ALTERNATIVE FUEL SYSTEMS
Prins

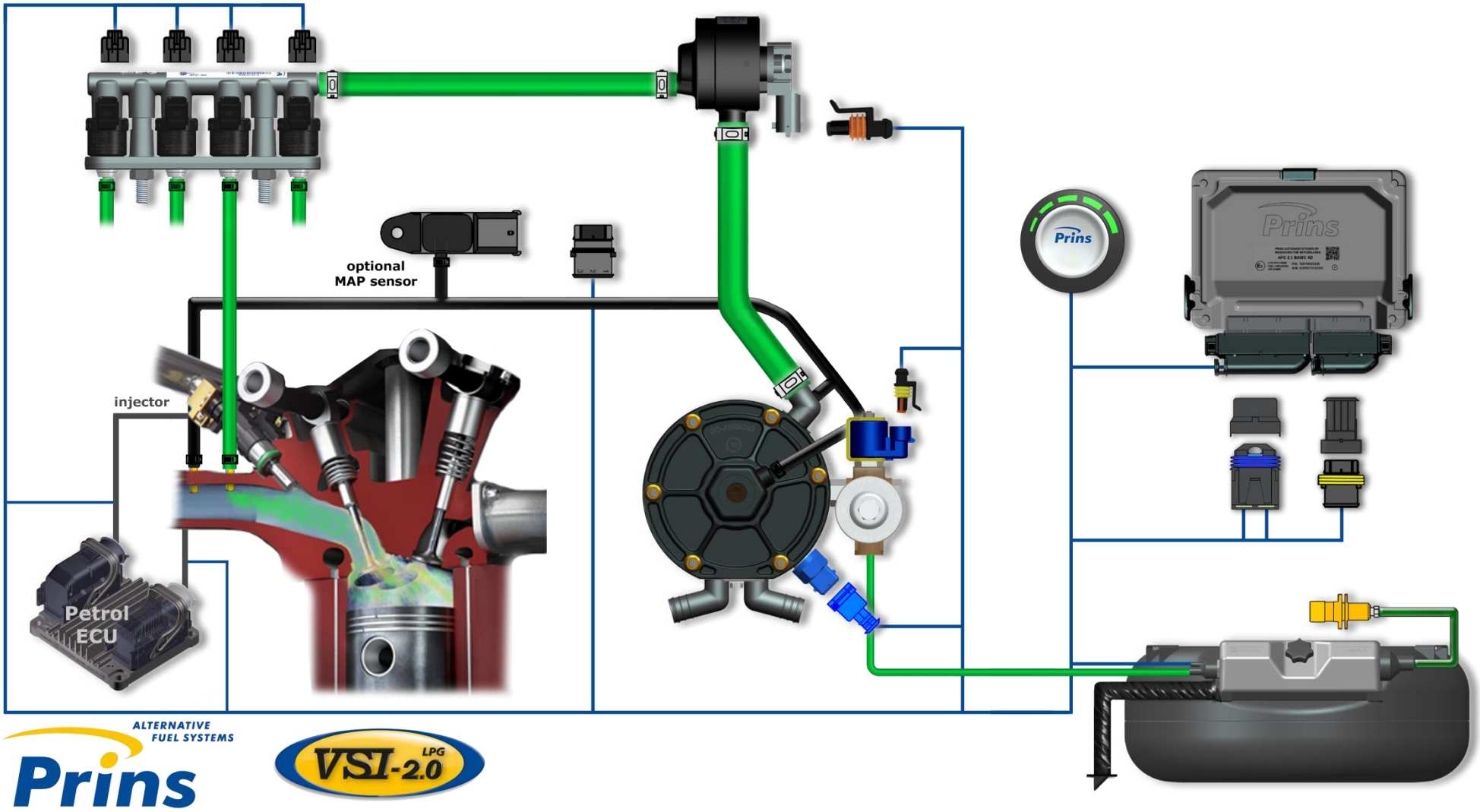
Diagram 39 VSI-2.0 wiring 191/040000

VSI-2 LPG Basic system overview

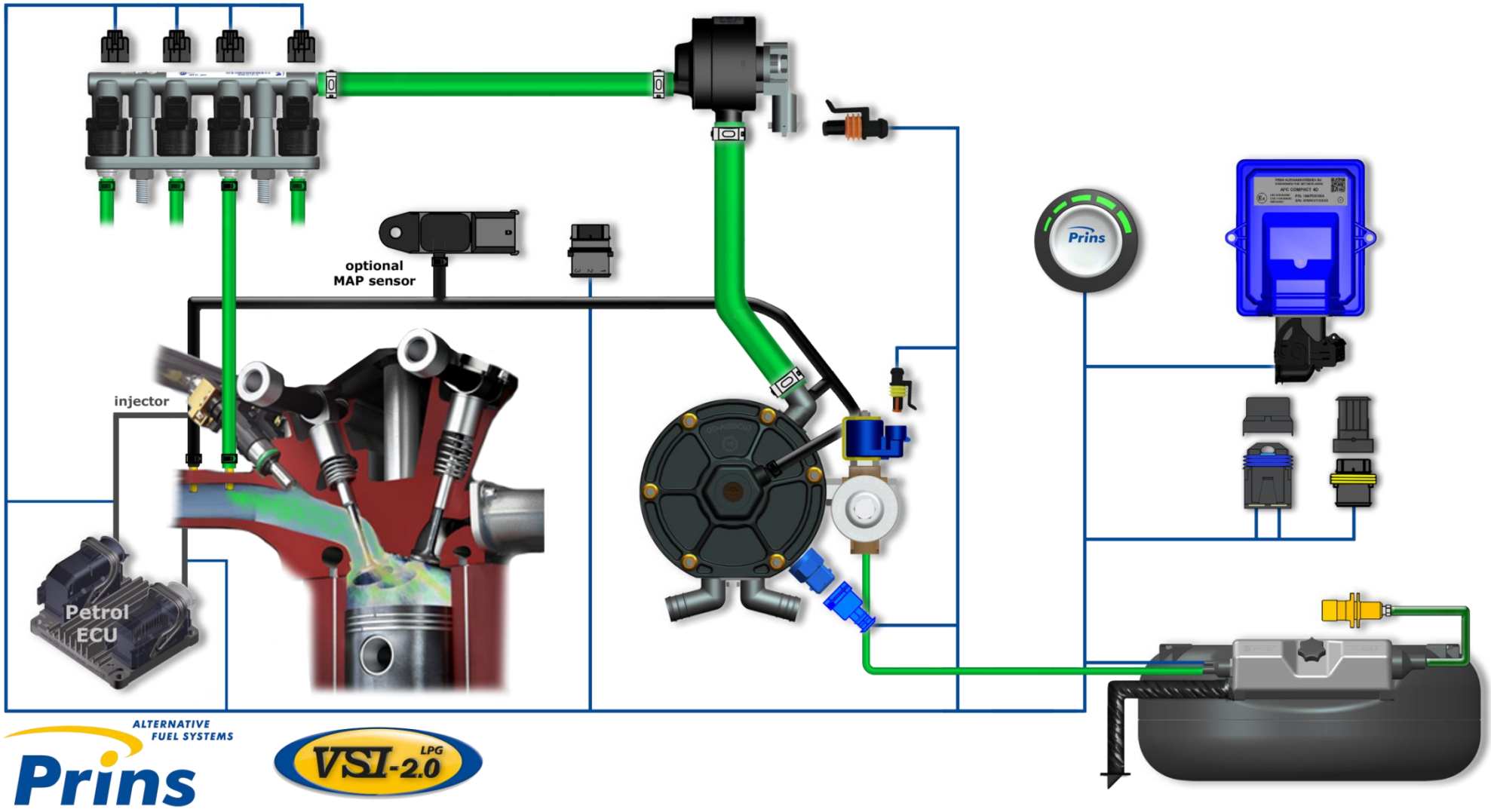
VSI LPG Basic system overview 3 cylinder



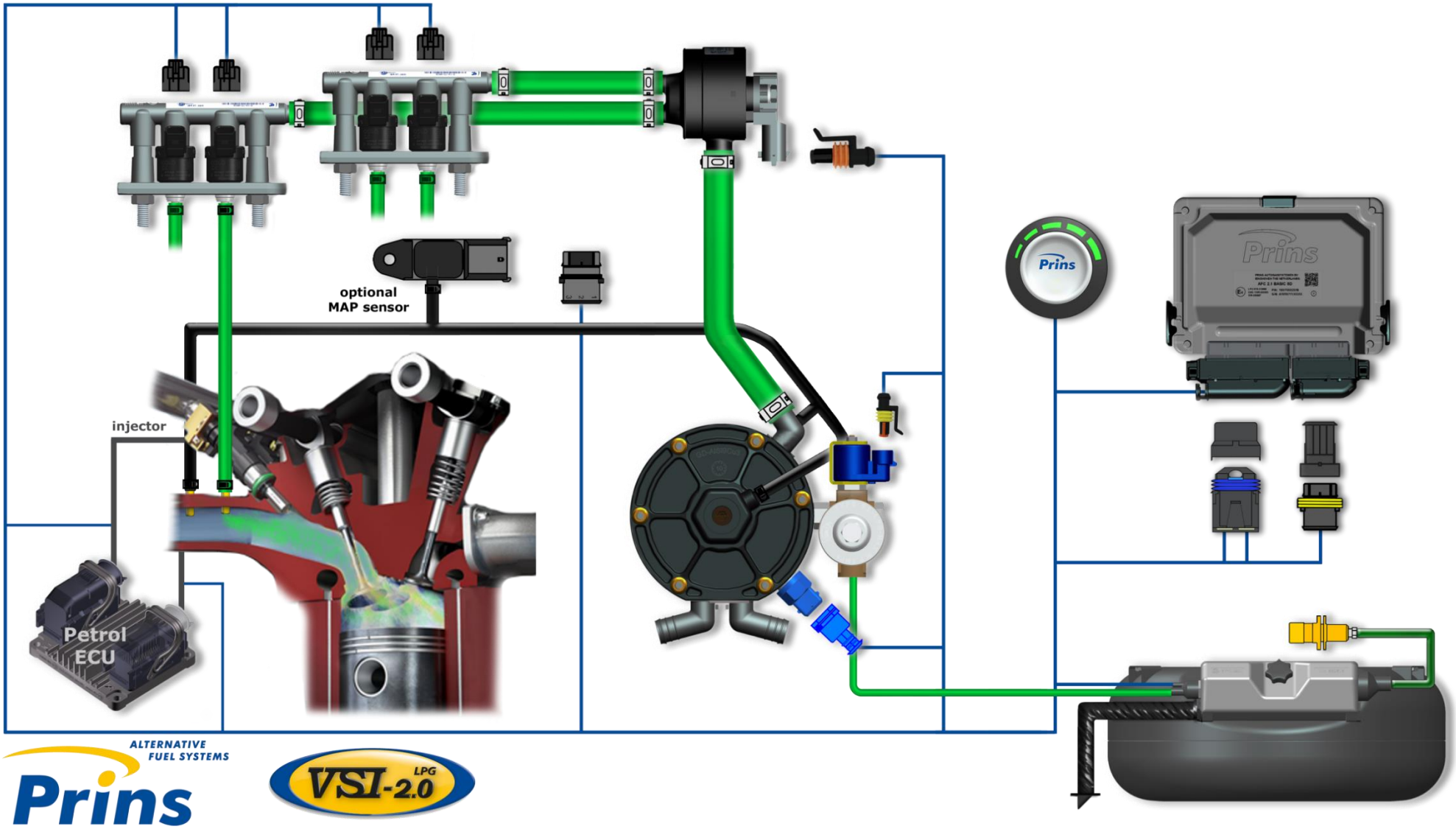
VSI LPG Basic system overview 4 cylinder



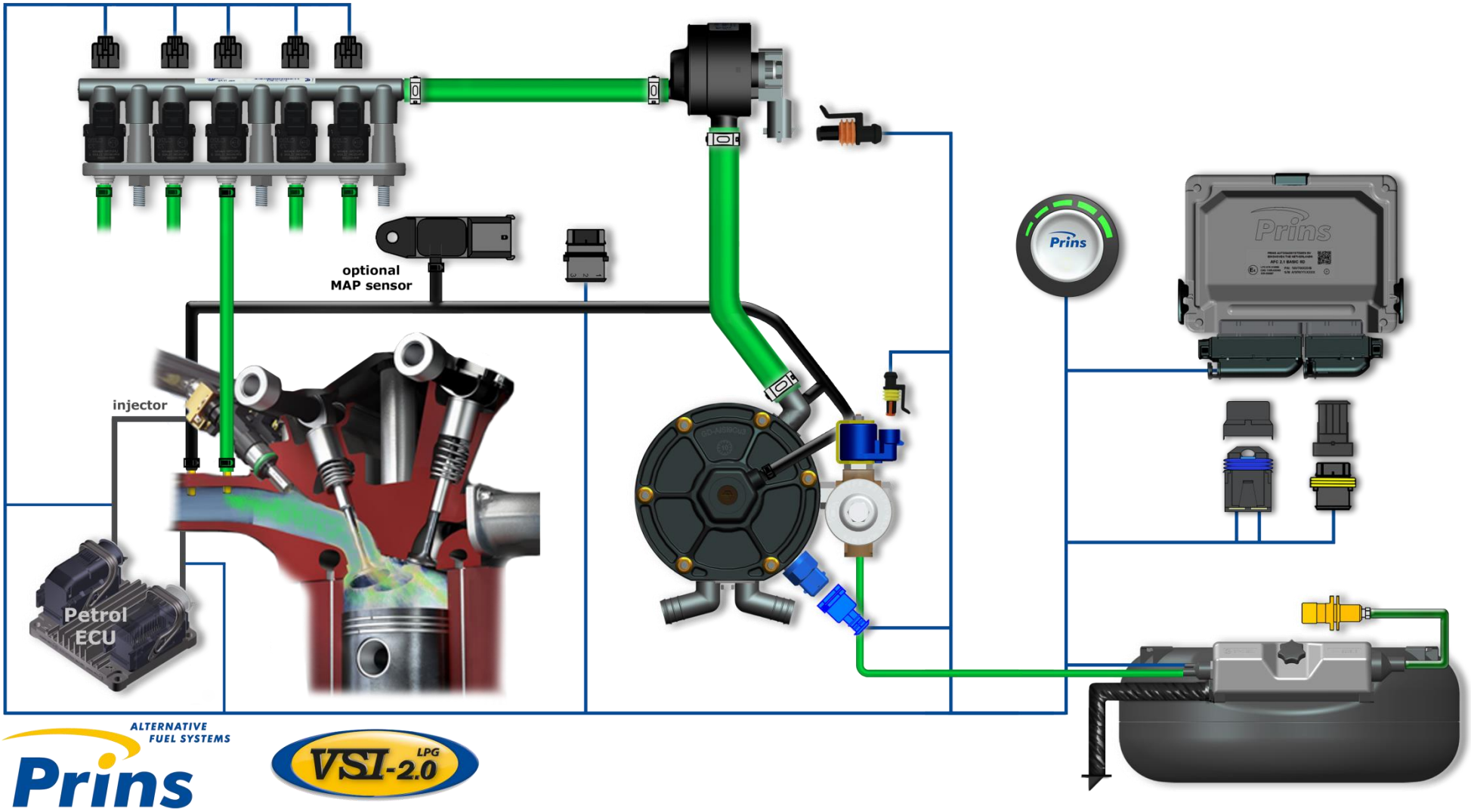
VSI LPG Basic system overview 4 cylinder Compact



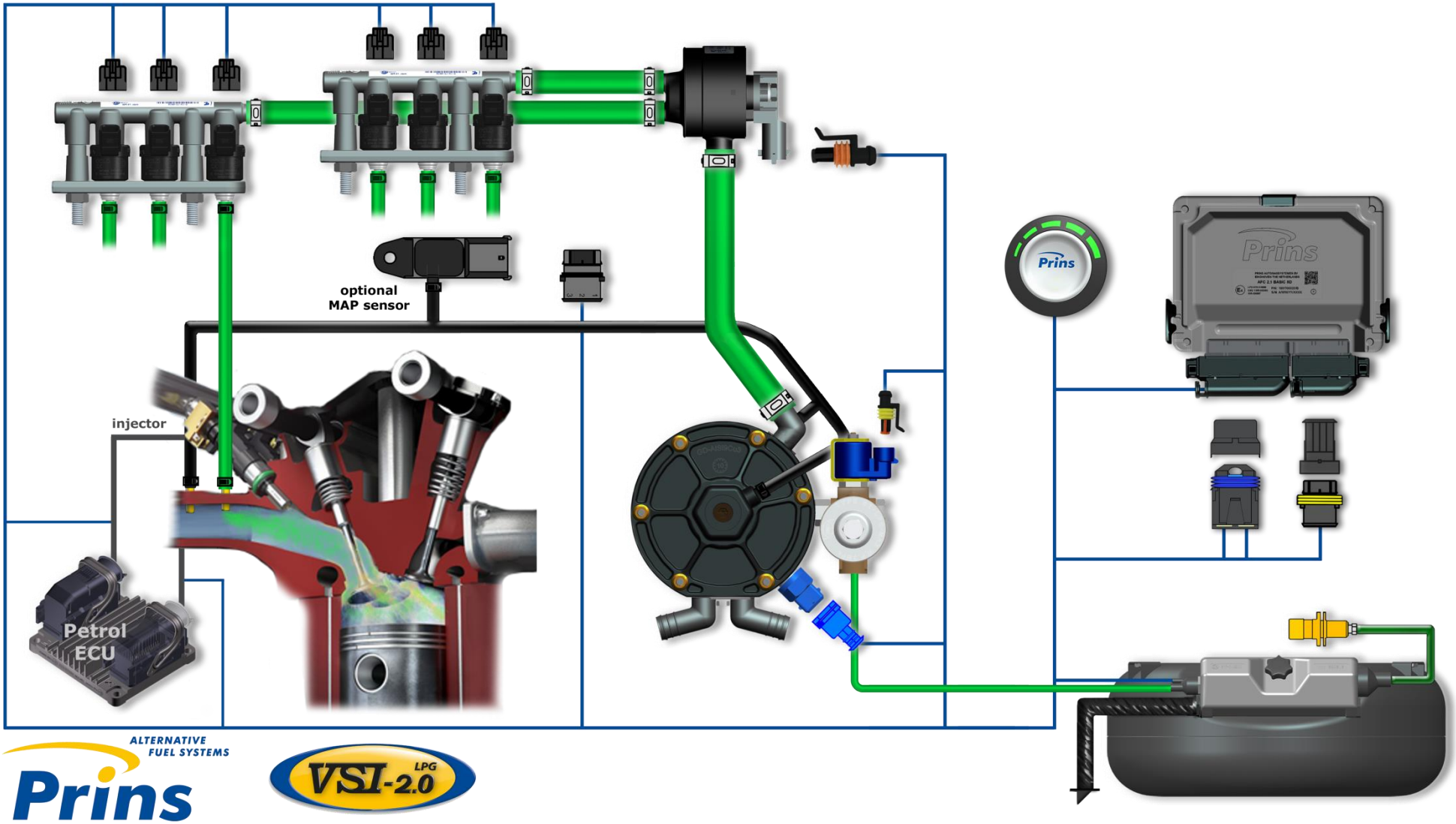
VSI LPG Basic system overview 4 cylinder Boxer



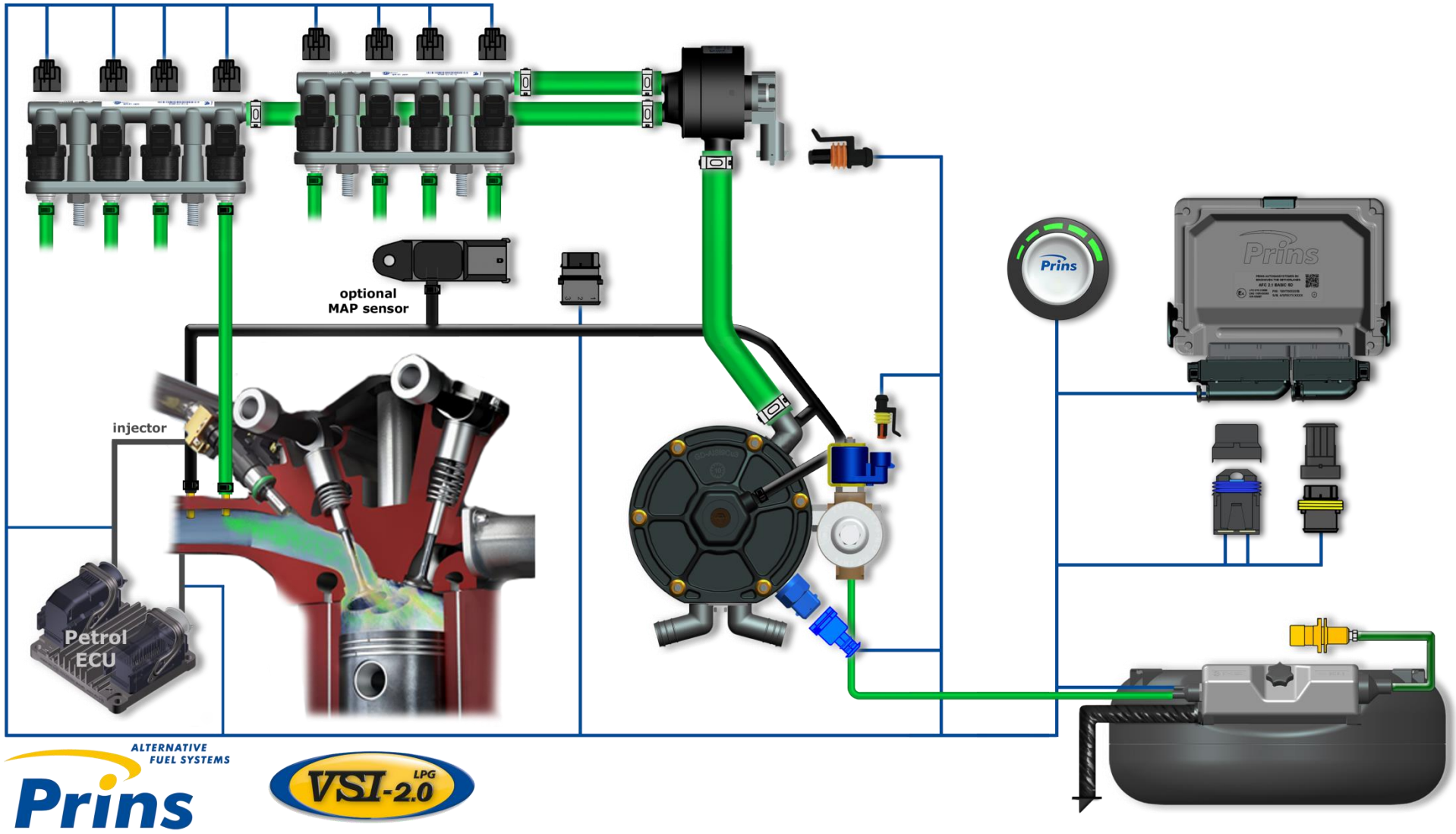
VSI LPG Basic system overview 5 cylinder



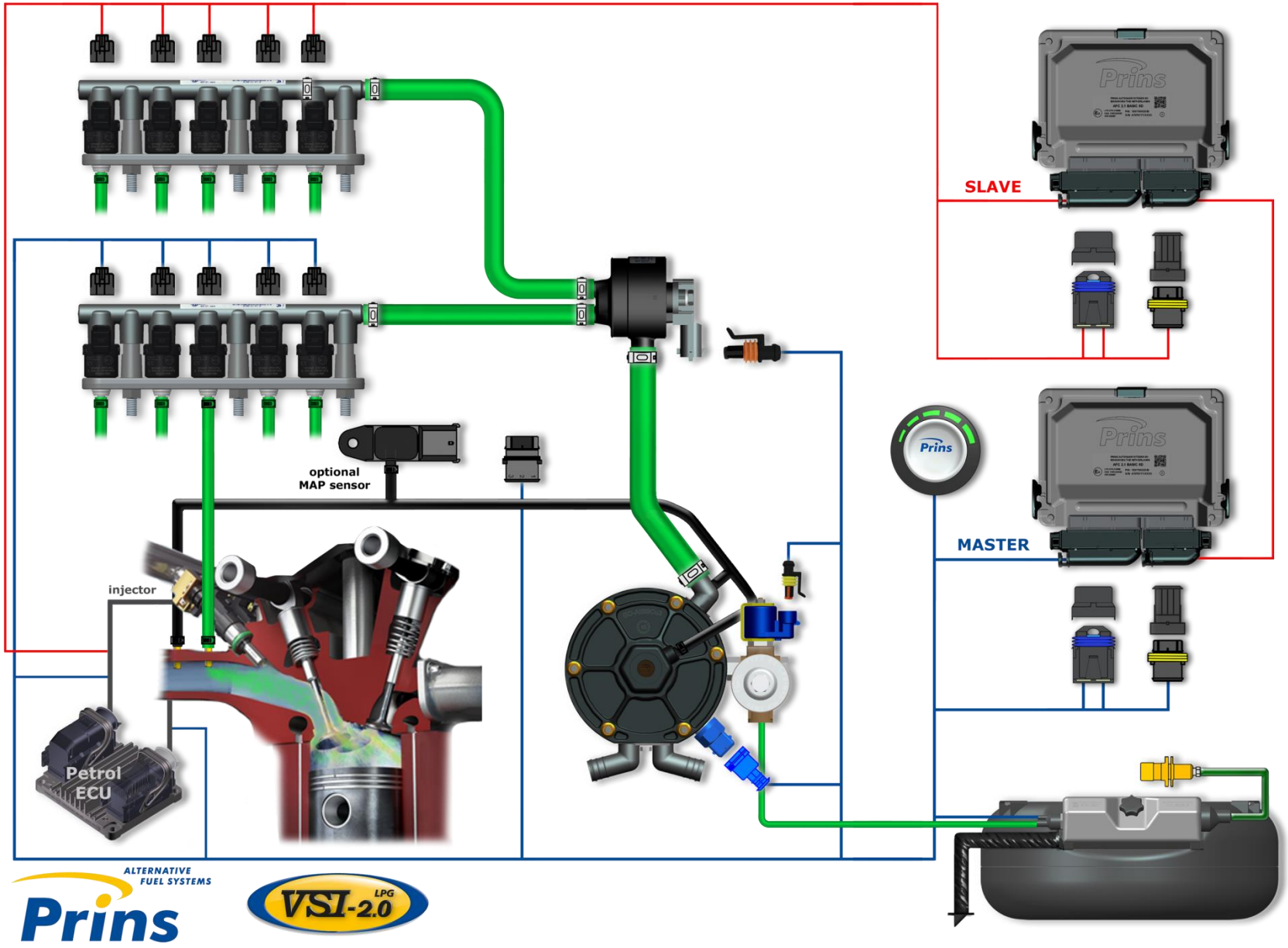
VSI LPG Basic system overview 6 cylinder



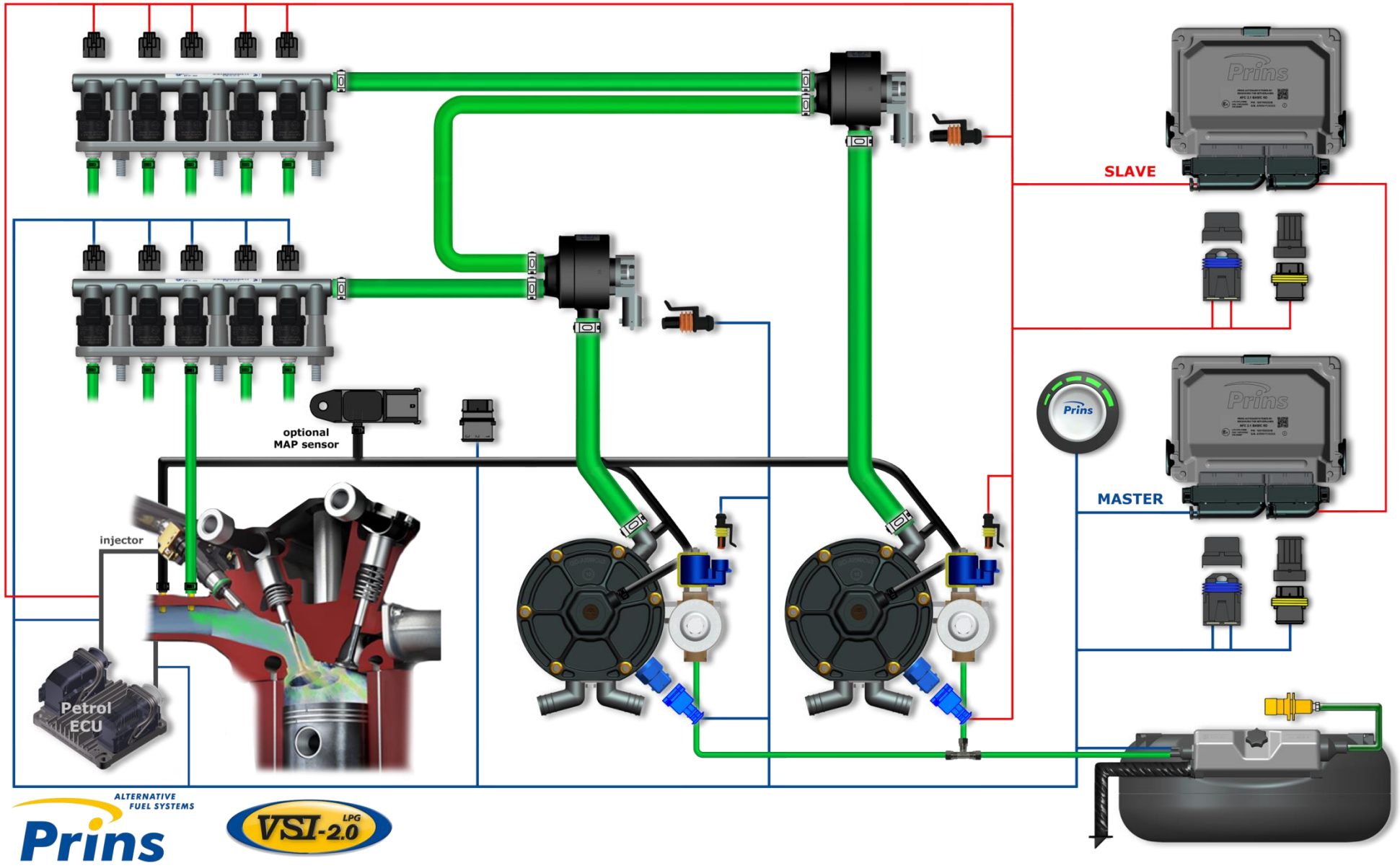
VSI LPG Basic system overview 8 cylinder



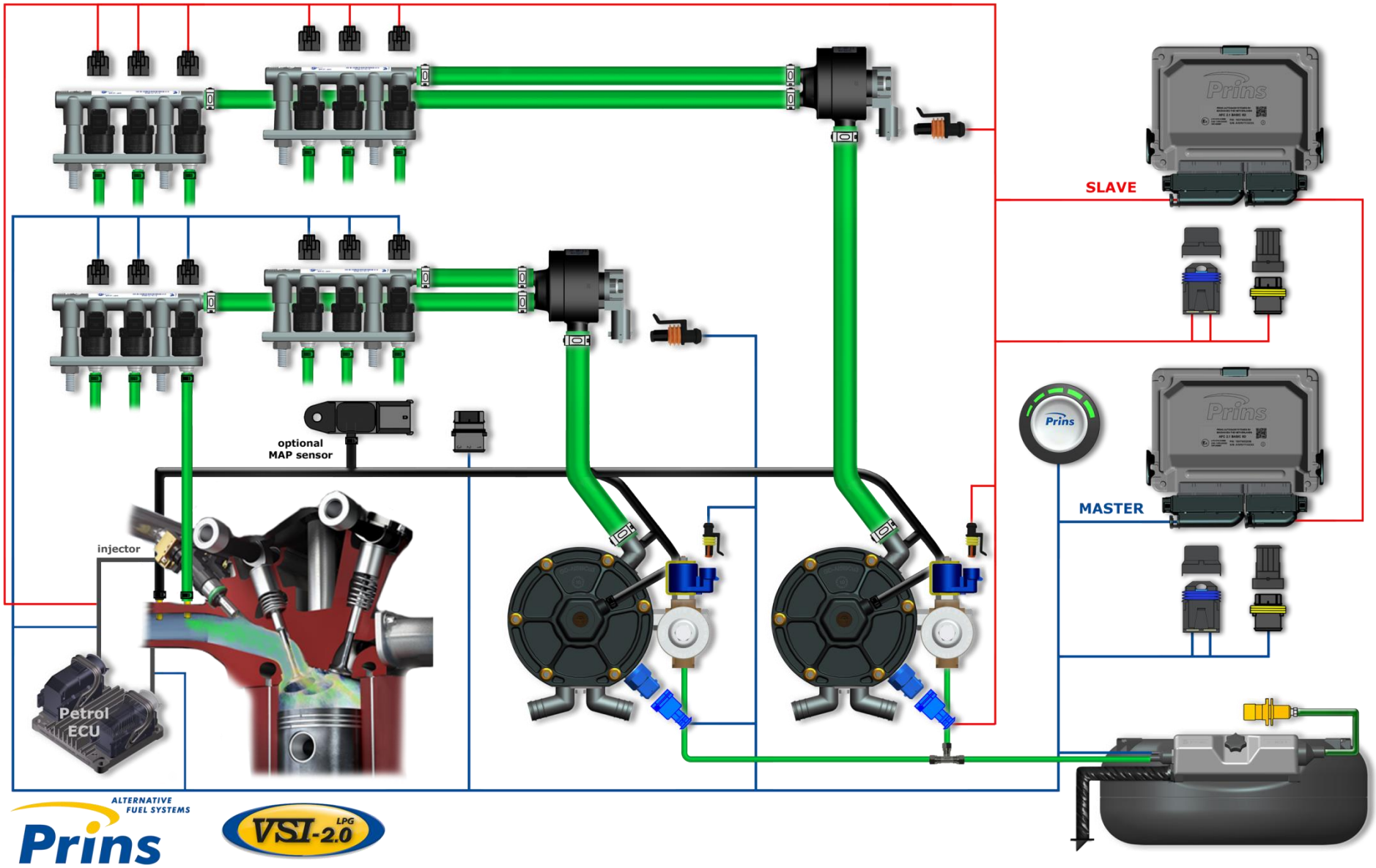
VSI LPG Basic system overview 10 cylinder



VSI LPG Basic system overview 10 cylinder High Output

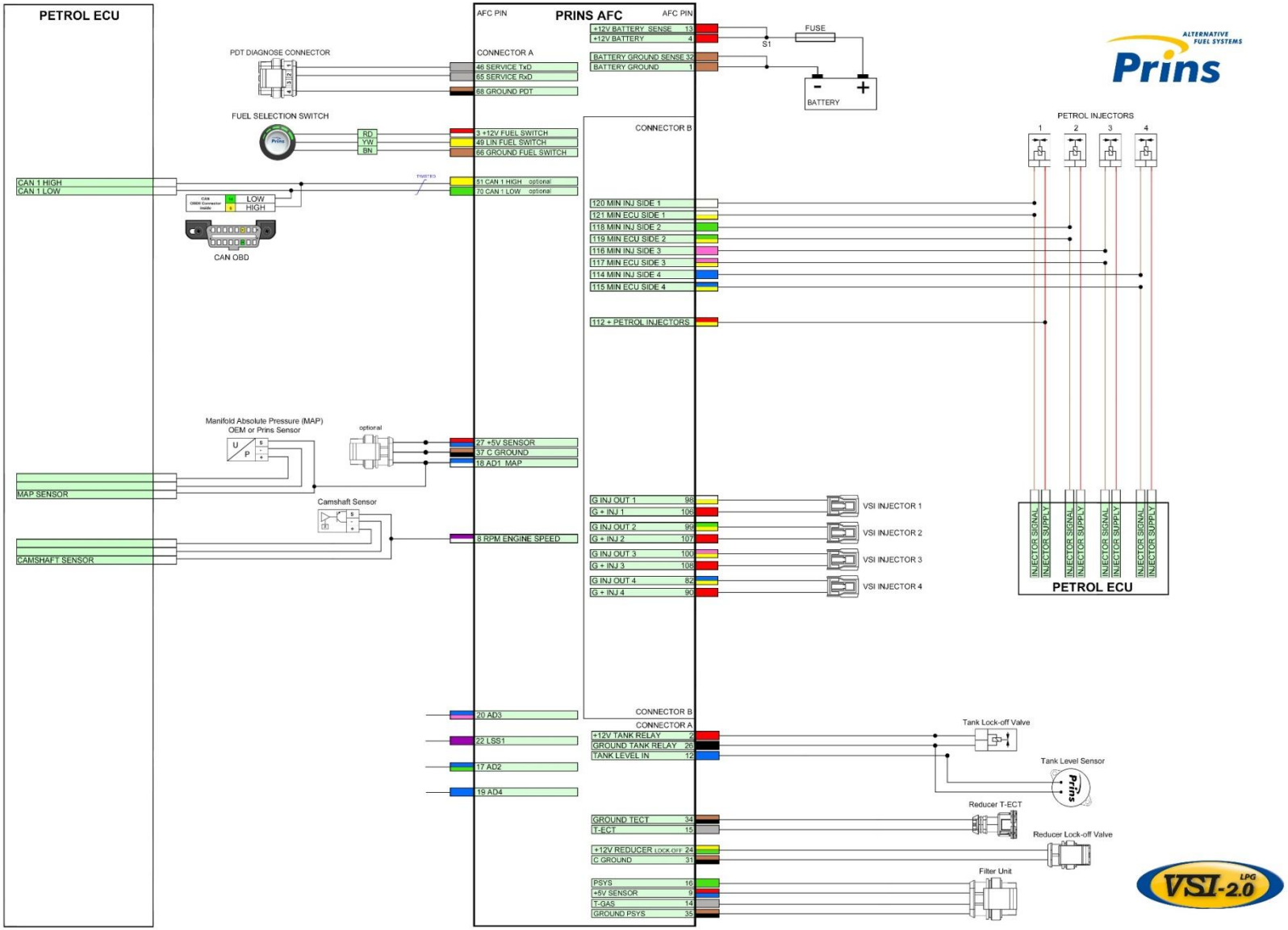


VSI LPG Basic system overview 12 cylinder

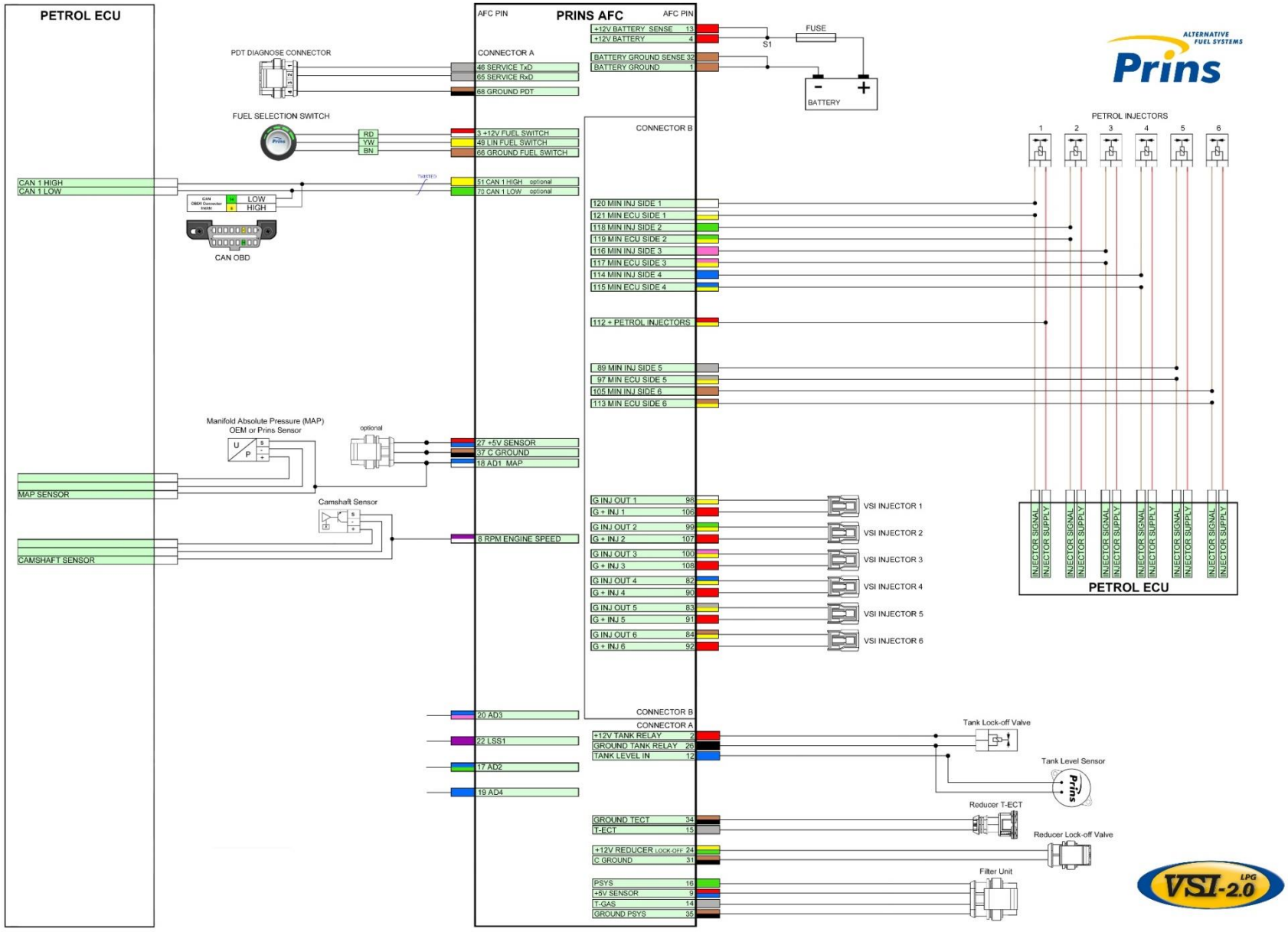


VSI-2 Wiring diagram

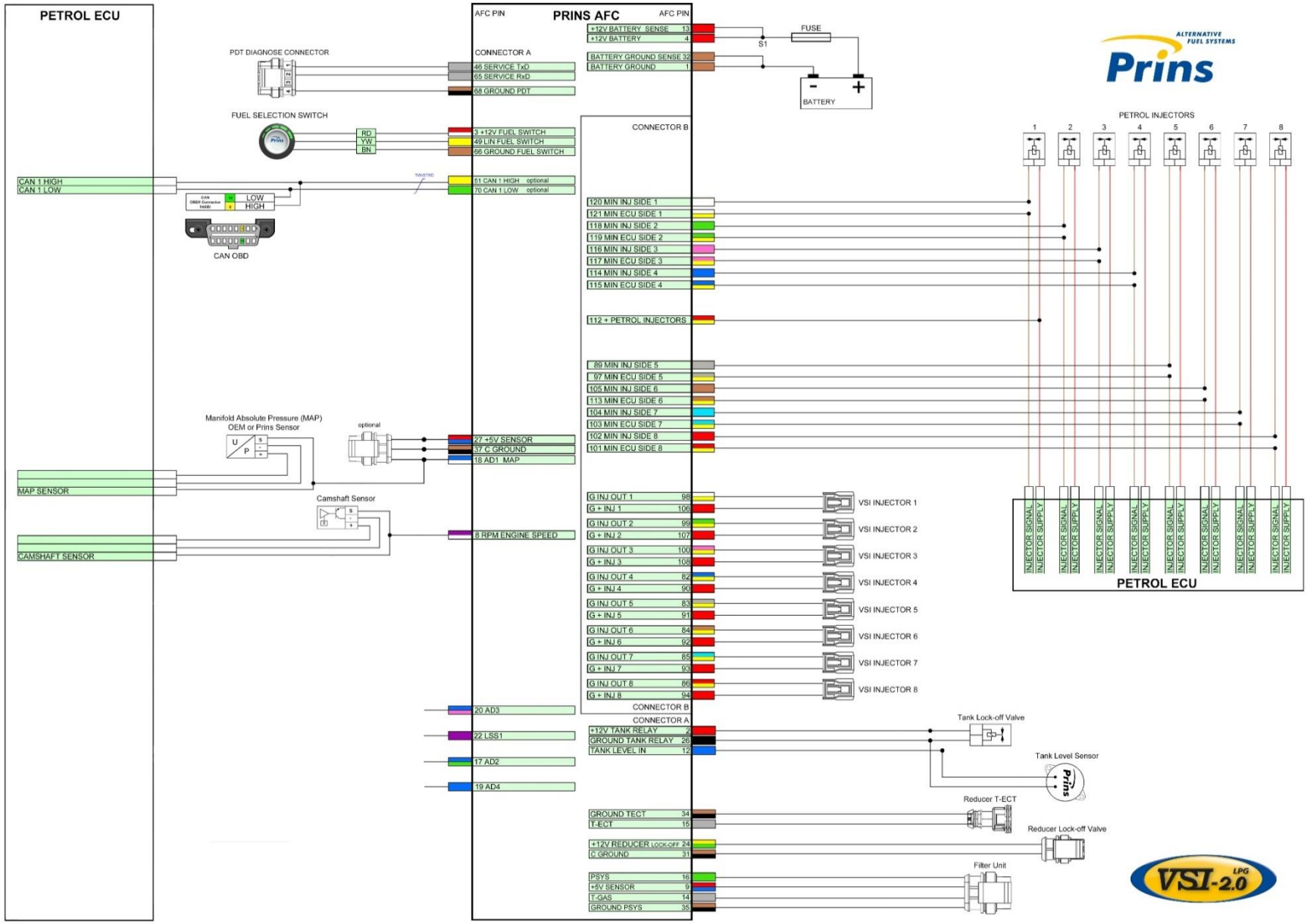
VSI-2 Basic Wiring Diagram 4-cylinder



VSI LPG Basic Wiring Diagram 6-cylinder

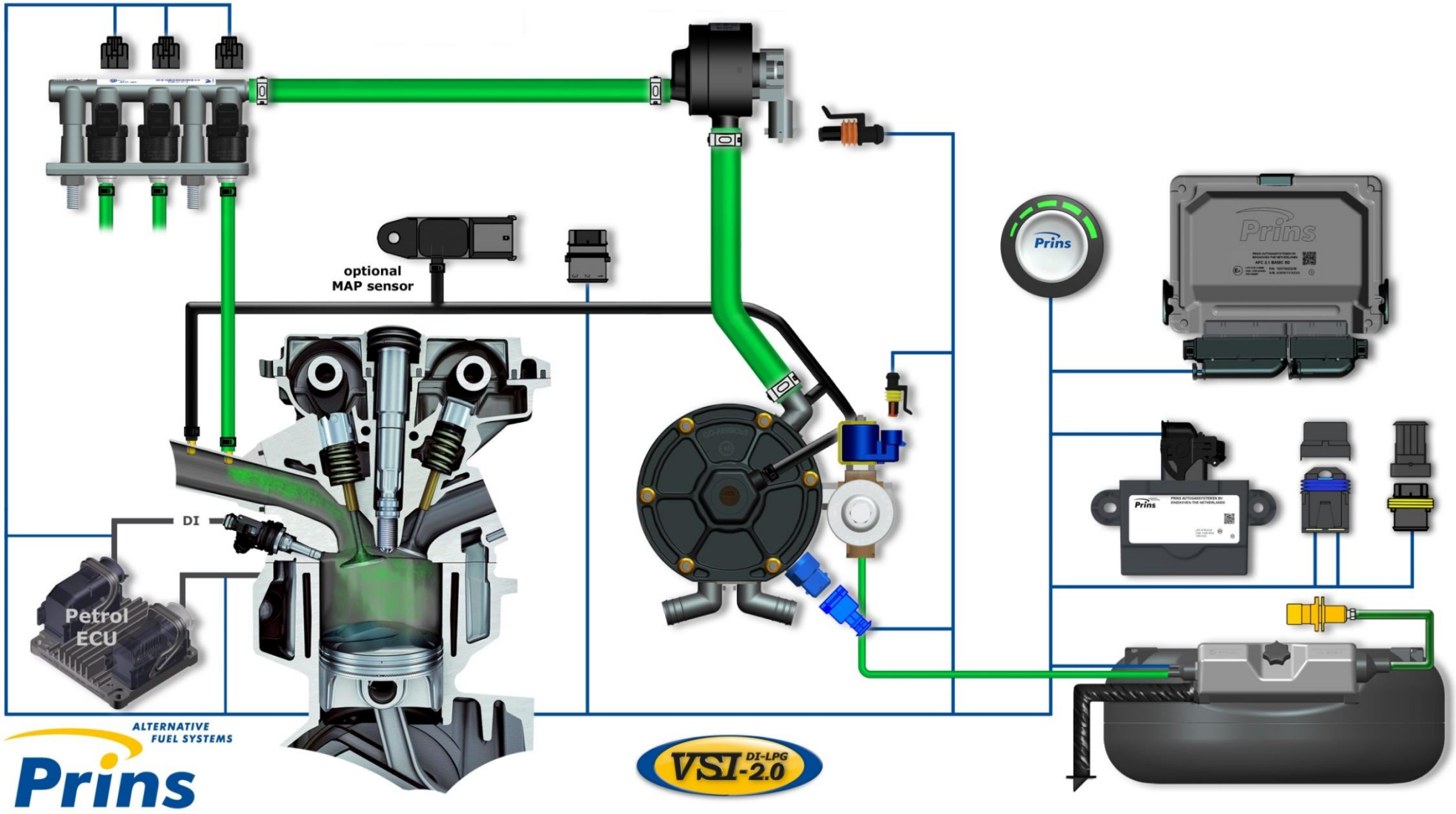


VSI LPG Basic Wiring Diagram 8-cylinder

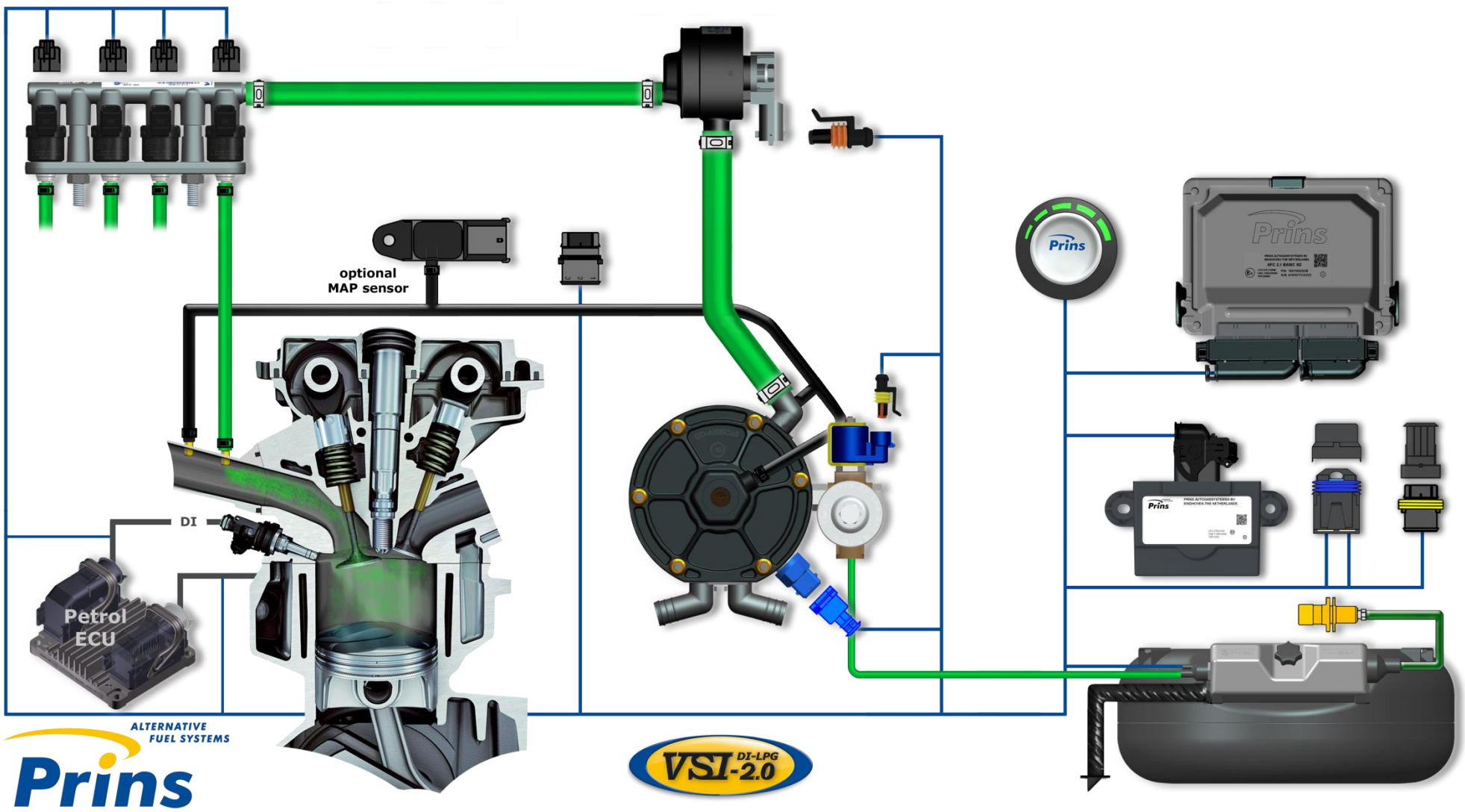


VSI-DI LPG Basic system overview

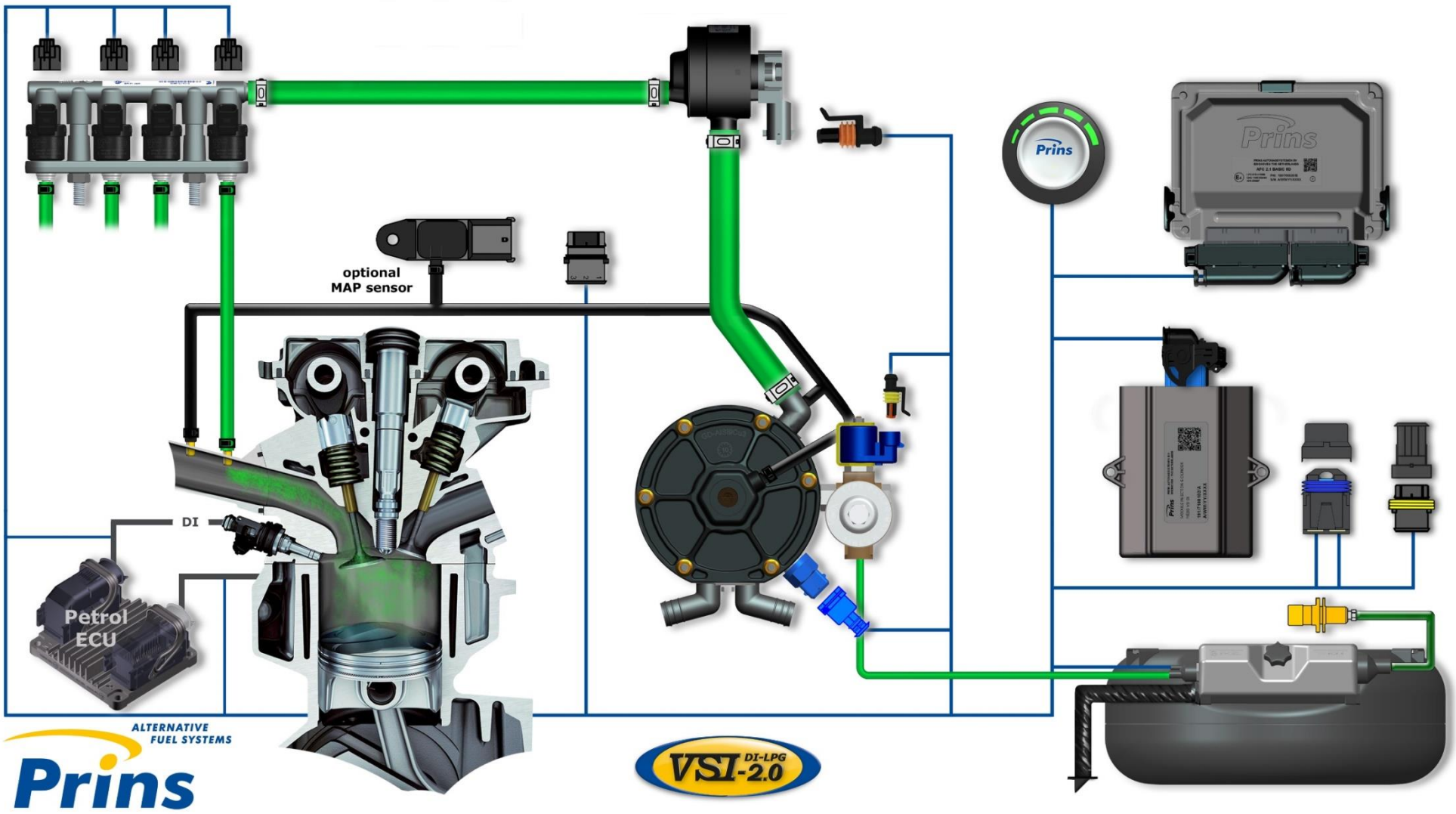
VSI-DI LPG Basic system overview 3 cylinder



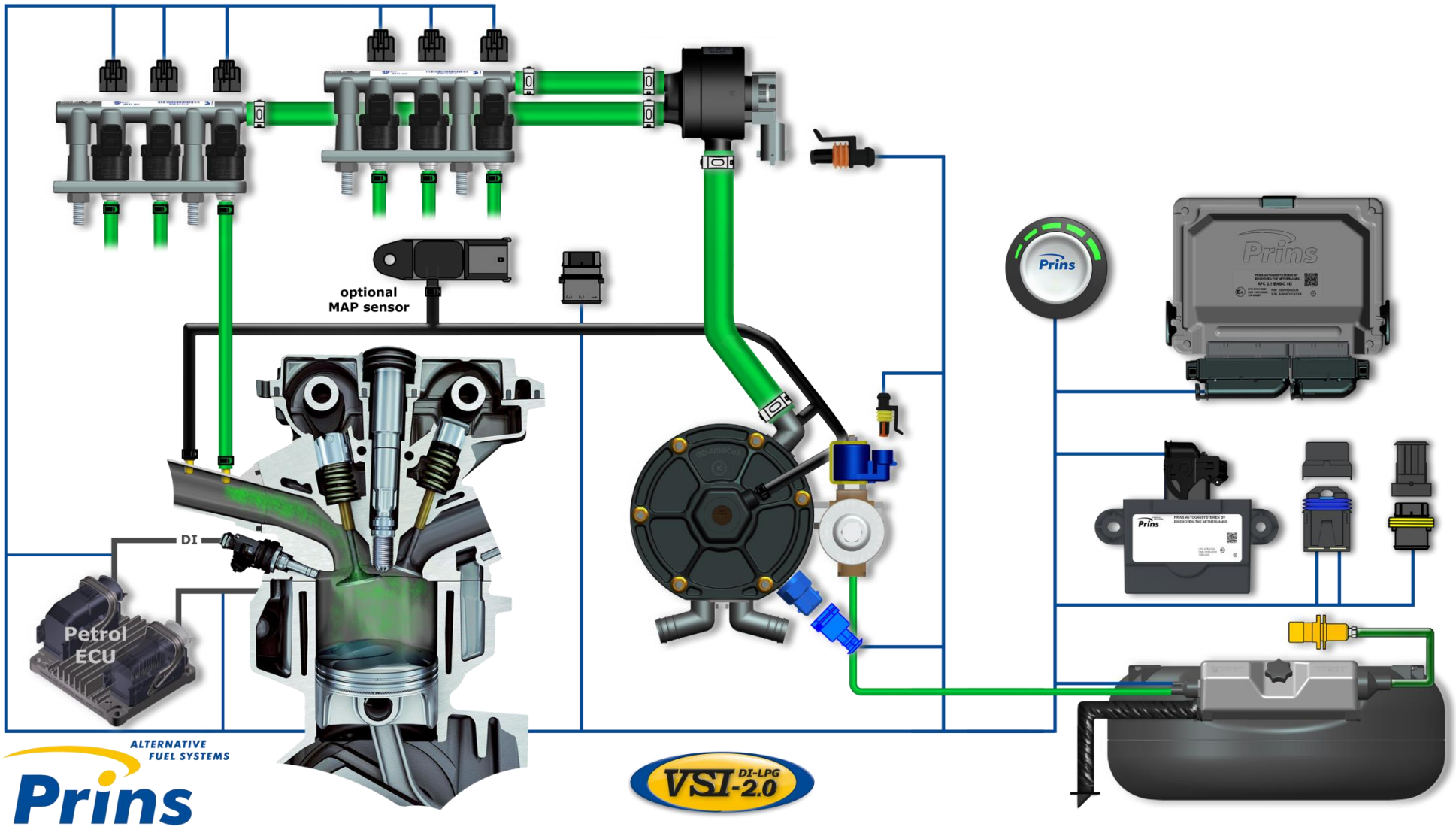
VSI-DI LPG Basic system overview **4 cylinder**



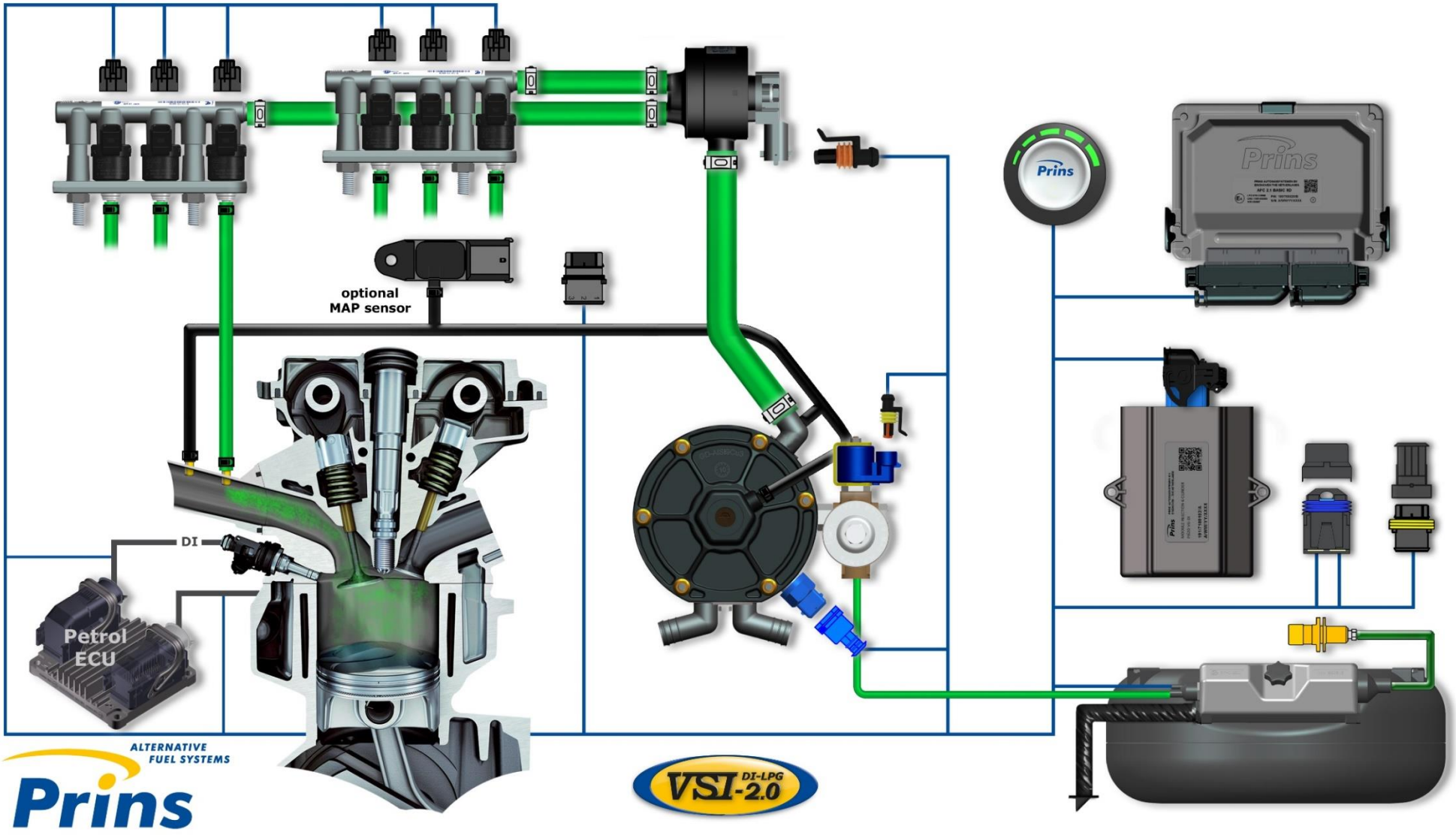
VSI-DI LPG Basic system overview **4 cylinder Piëzo**



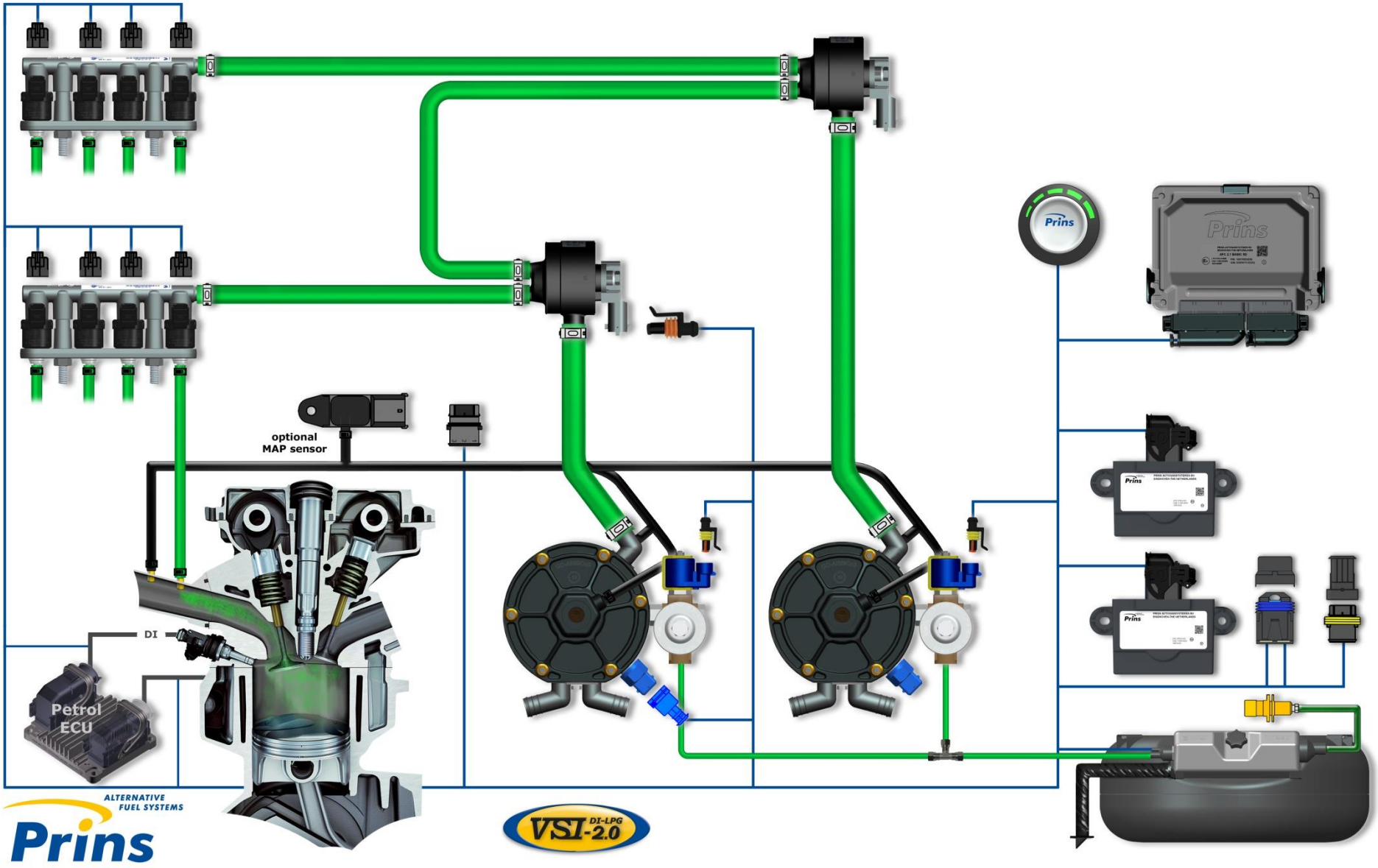
VSI-DI LPG Basic system overview **6 cylinder**



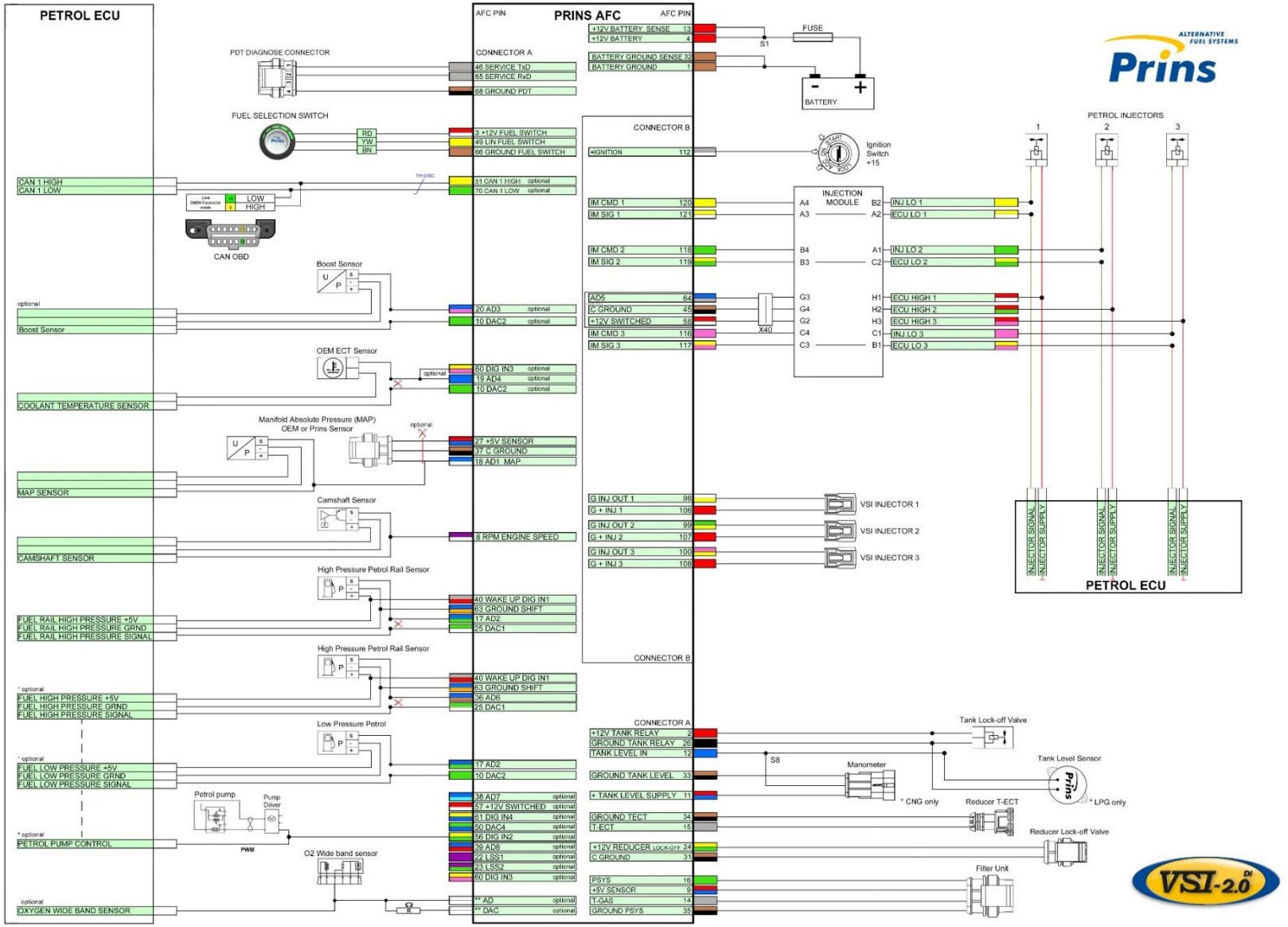
VSI-DI LPG Basic system overview **6 cylinder Piëzo**



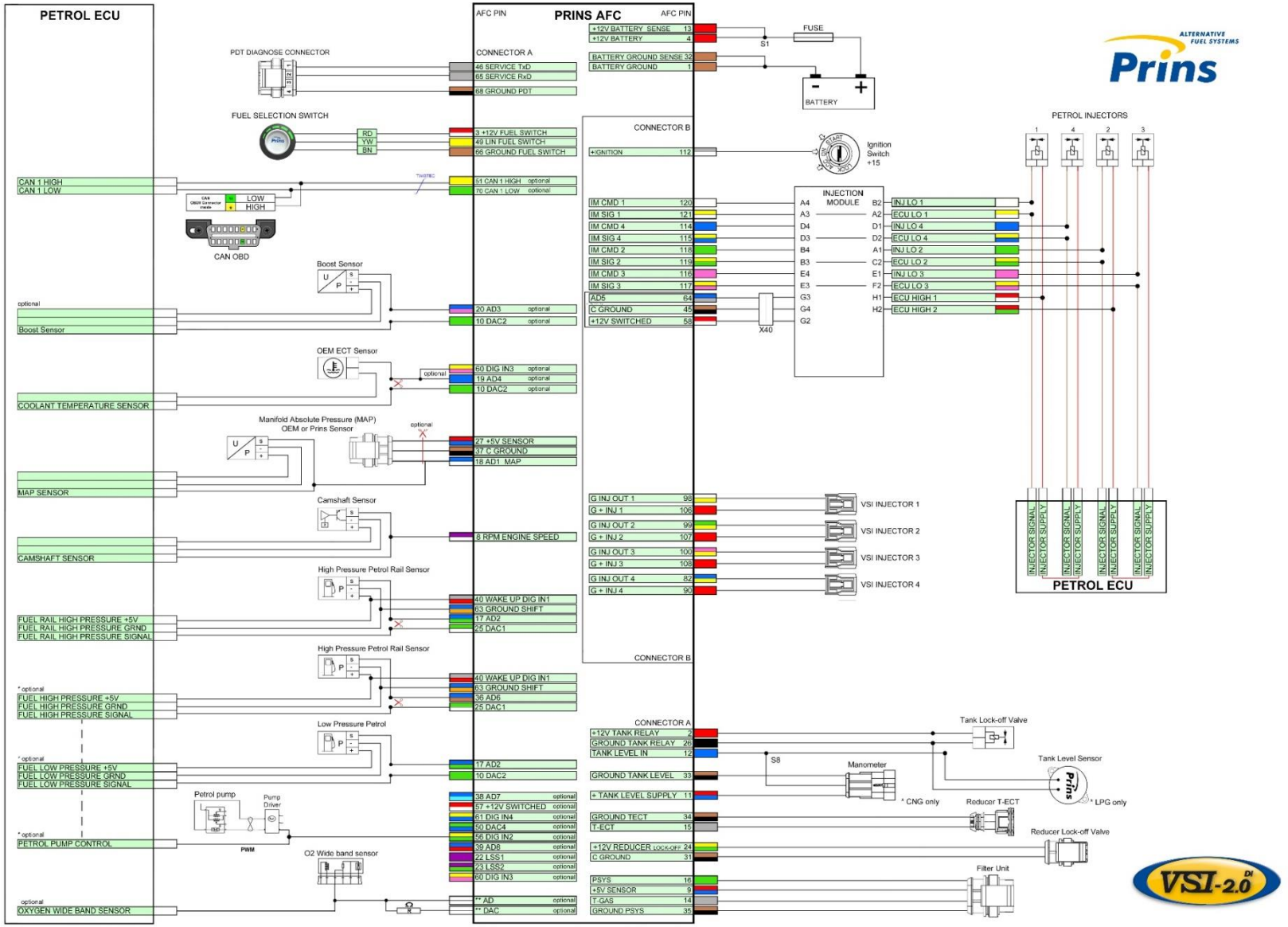
VSI-DI LPG Basic system overview **8 cylinder**



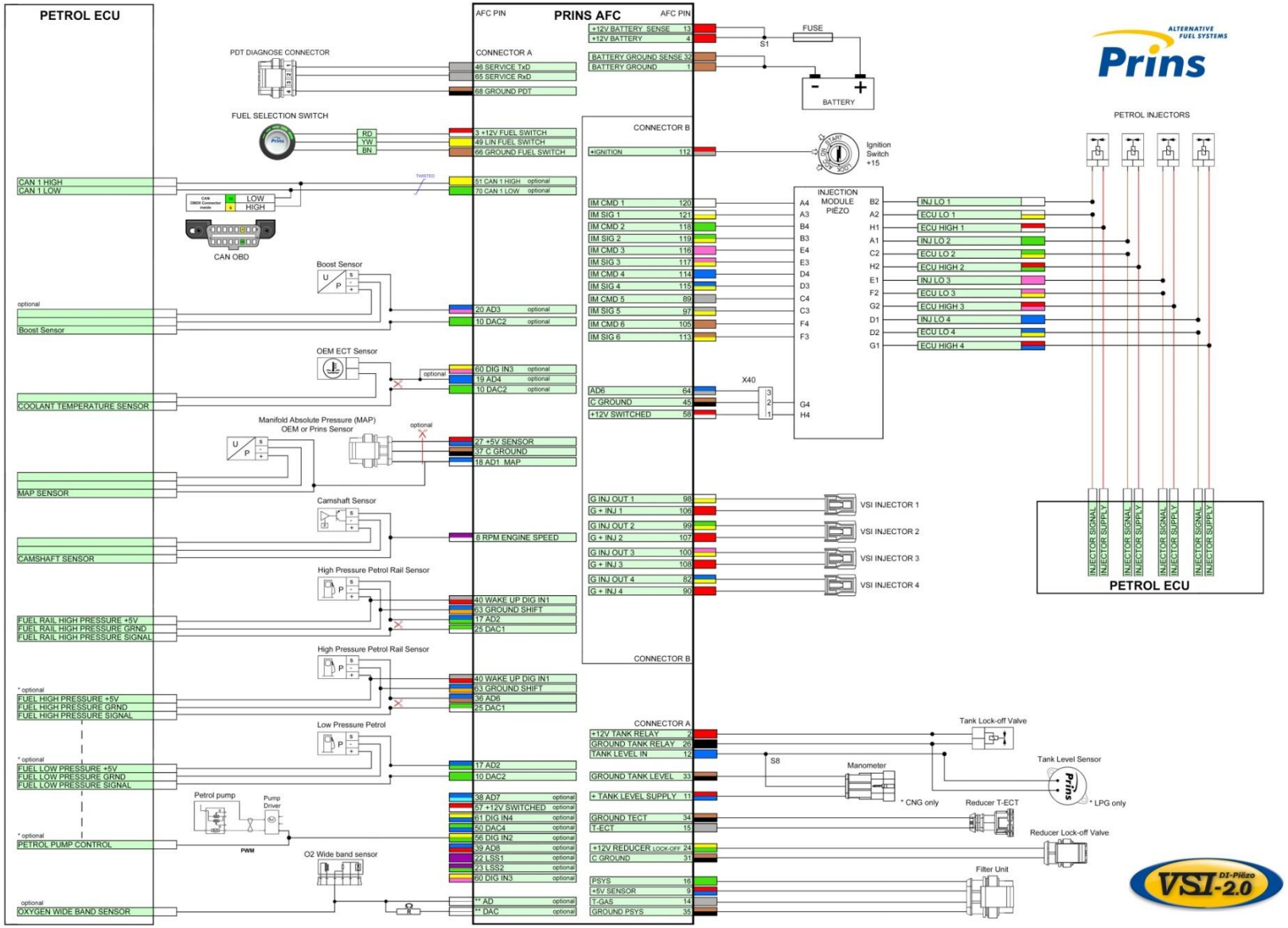
VSI-DI LPG Basic Wiring Diagram 3 cylinder



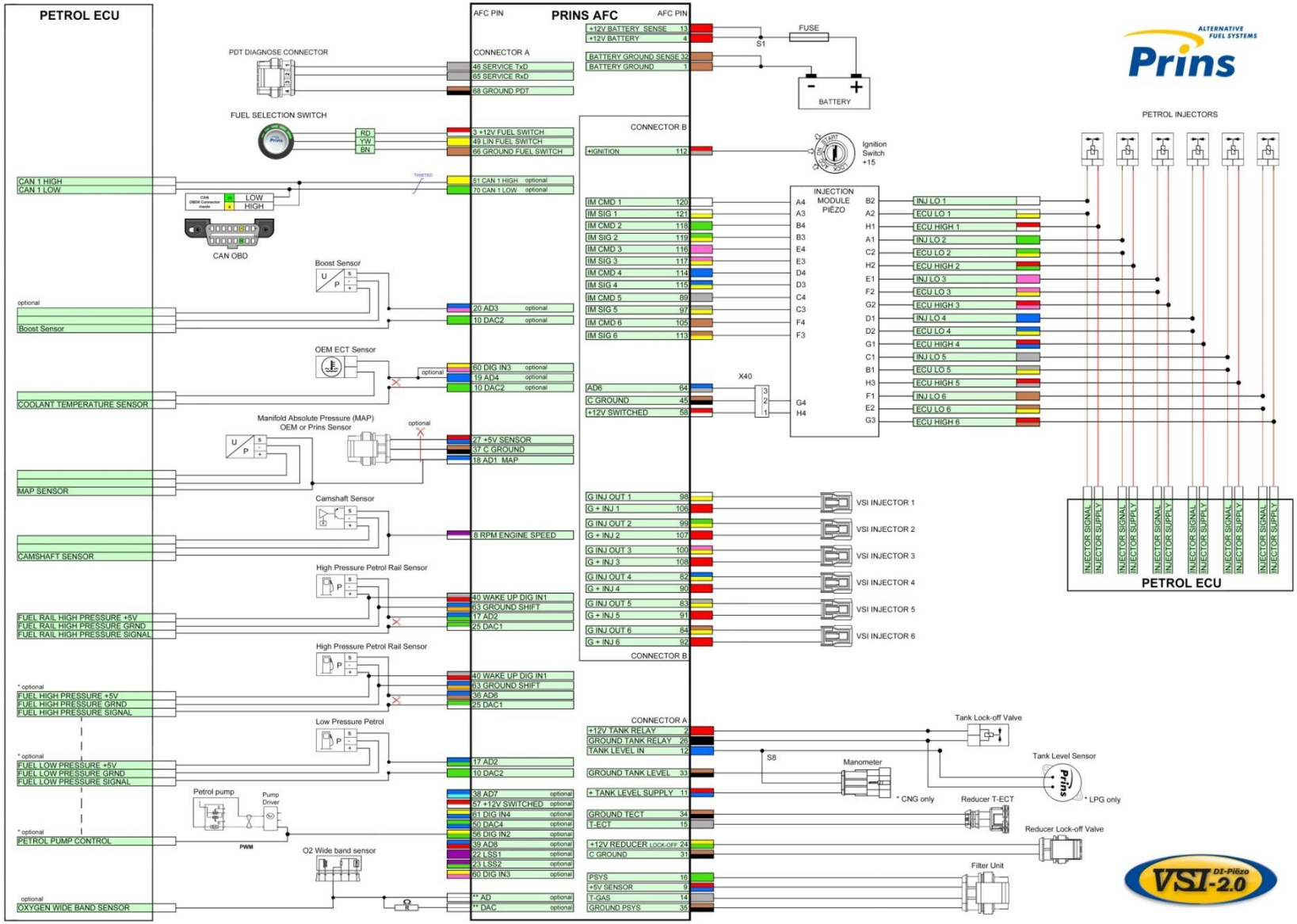
VSI-DI LPG Basic Wiring Diagram 4 cylinder



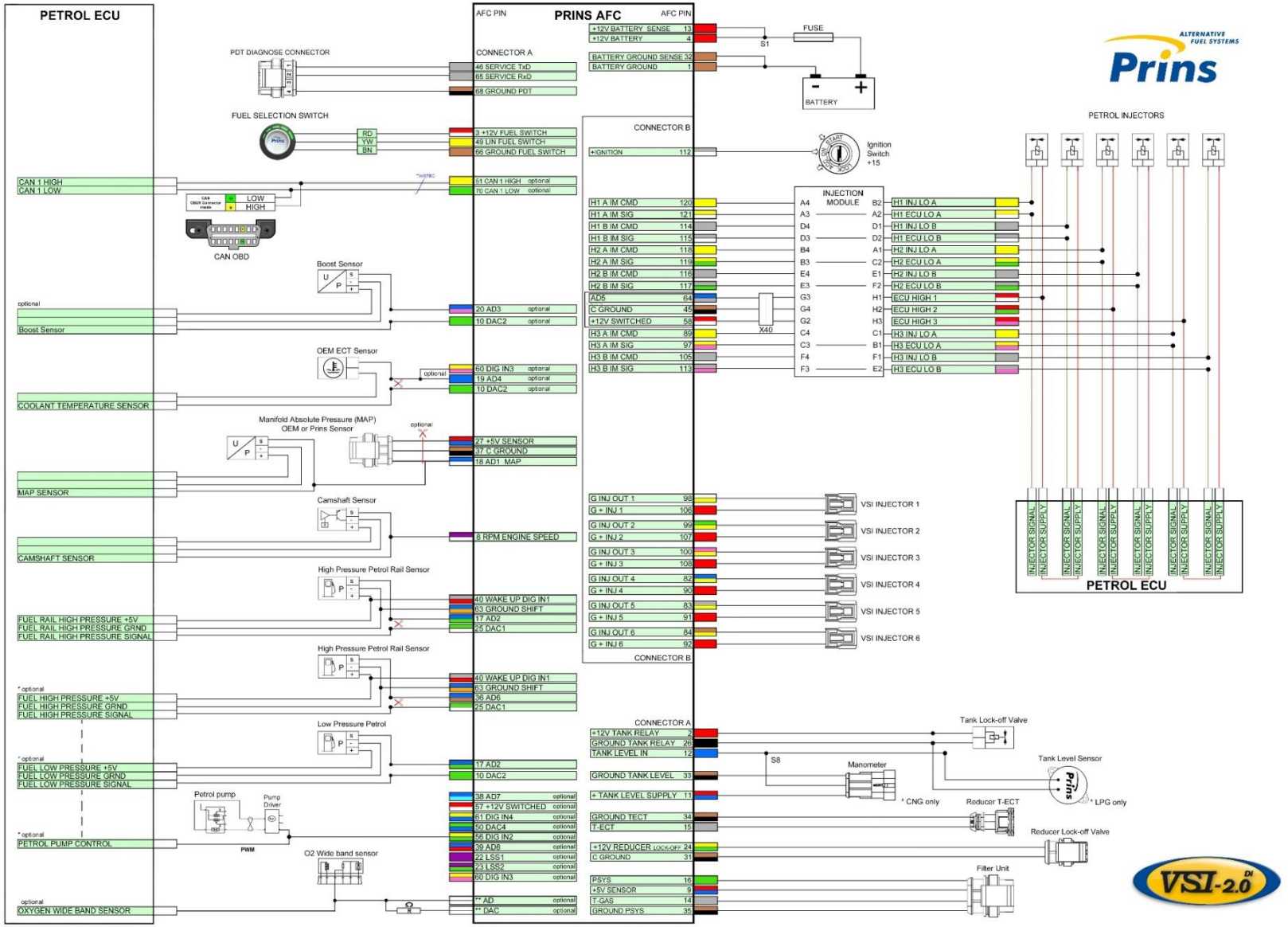
VSI-DI LPG Basic Wiring Diagram 4 cylinder Piëzo



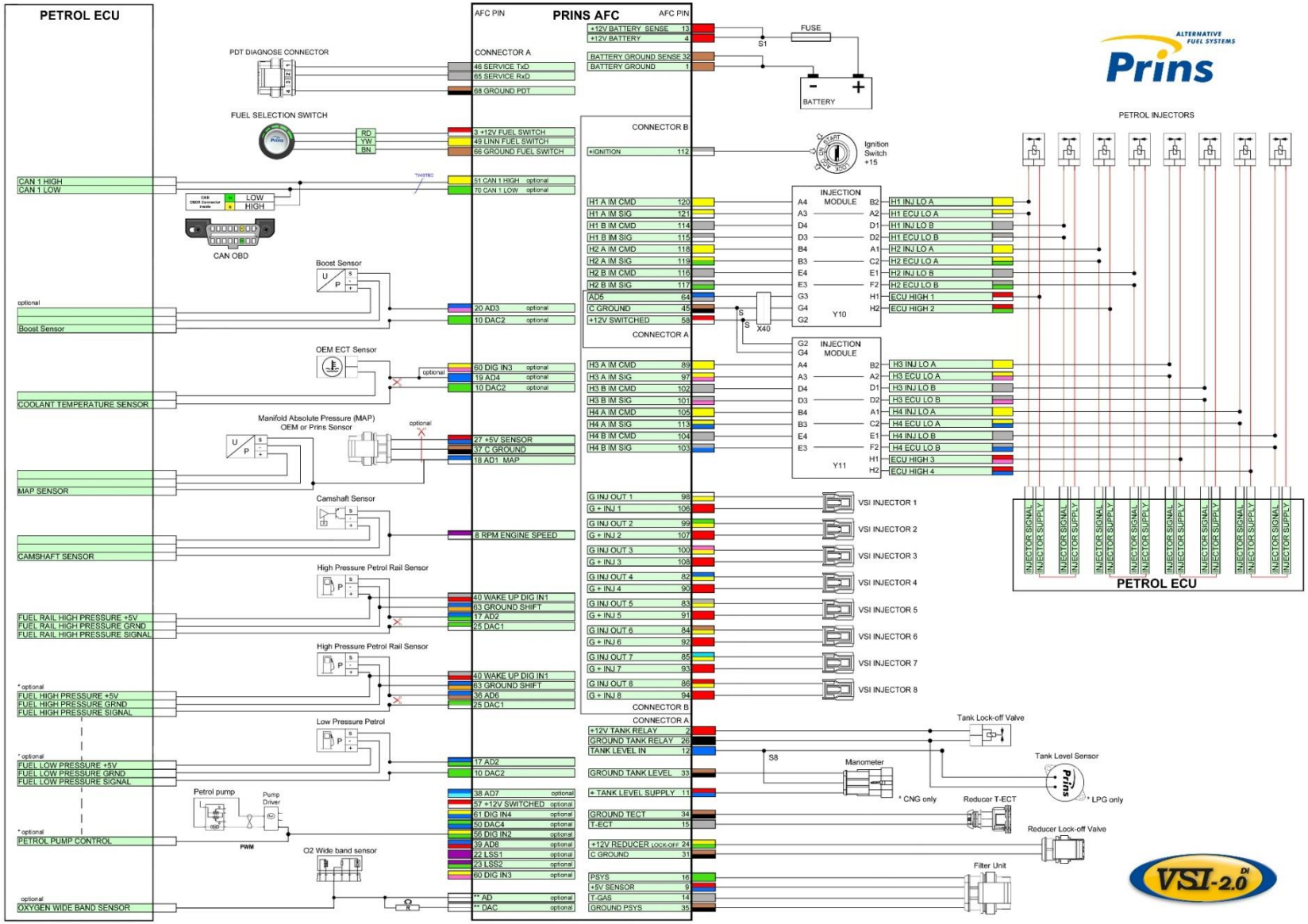
VSI-DI LPG Basic Wiring Diagram 6 cylinder Piëzo



VSI-DI LPG Basic Wiring Diagram 6 cylinder

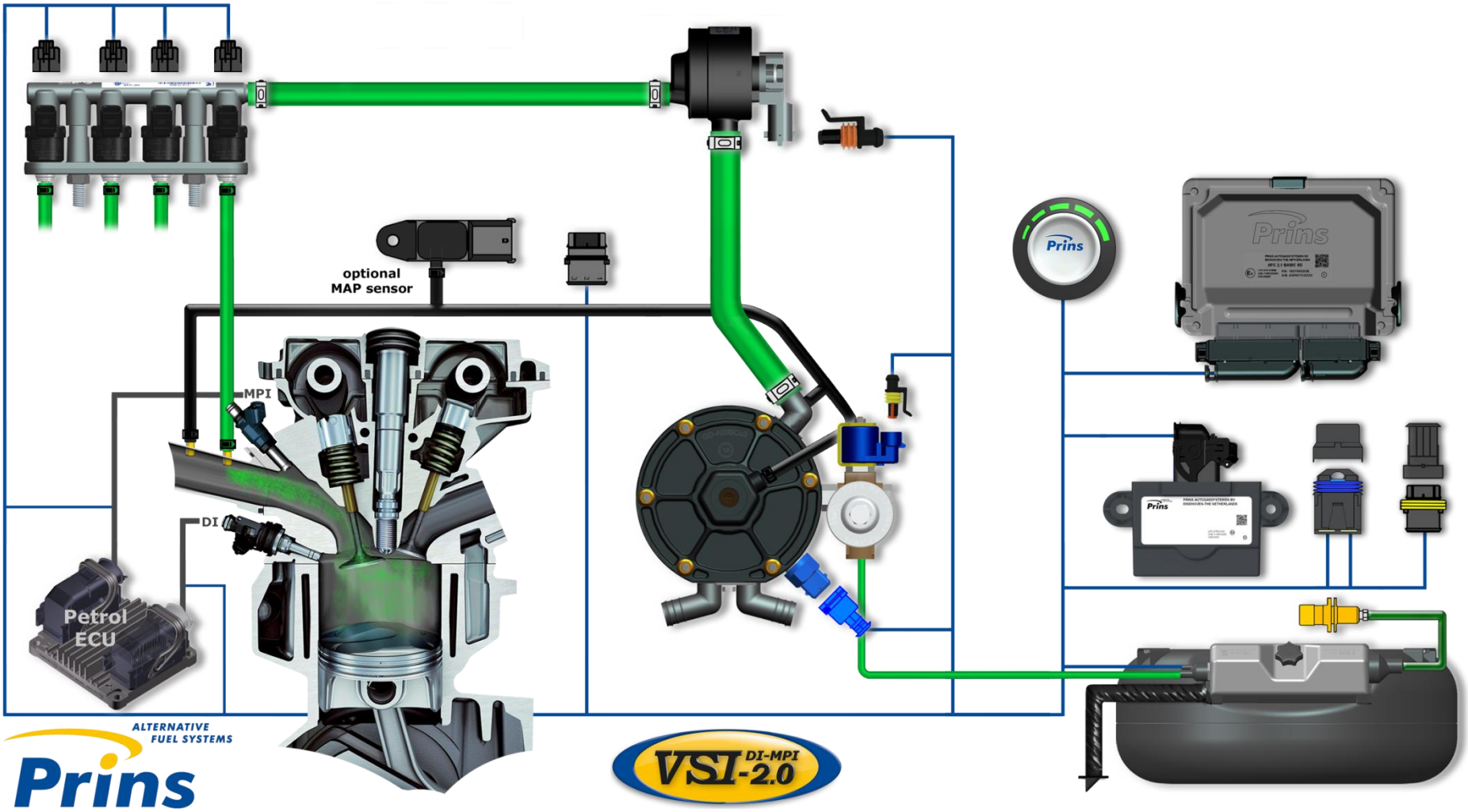


VSI-DI LPG Basic Wiring Diagram 8 cylinder

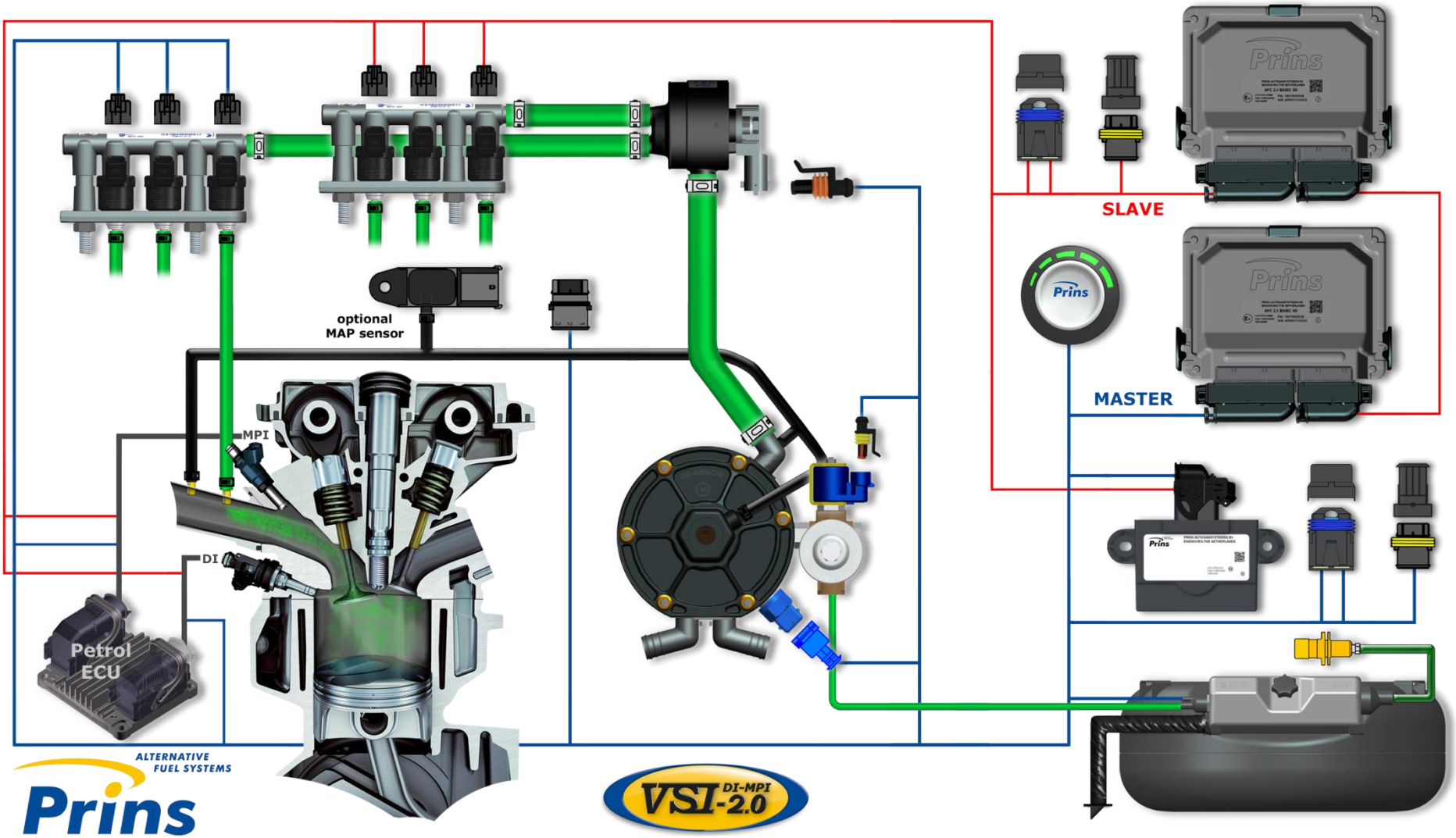


VSI-DI-MPI LPG Basic system overview

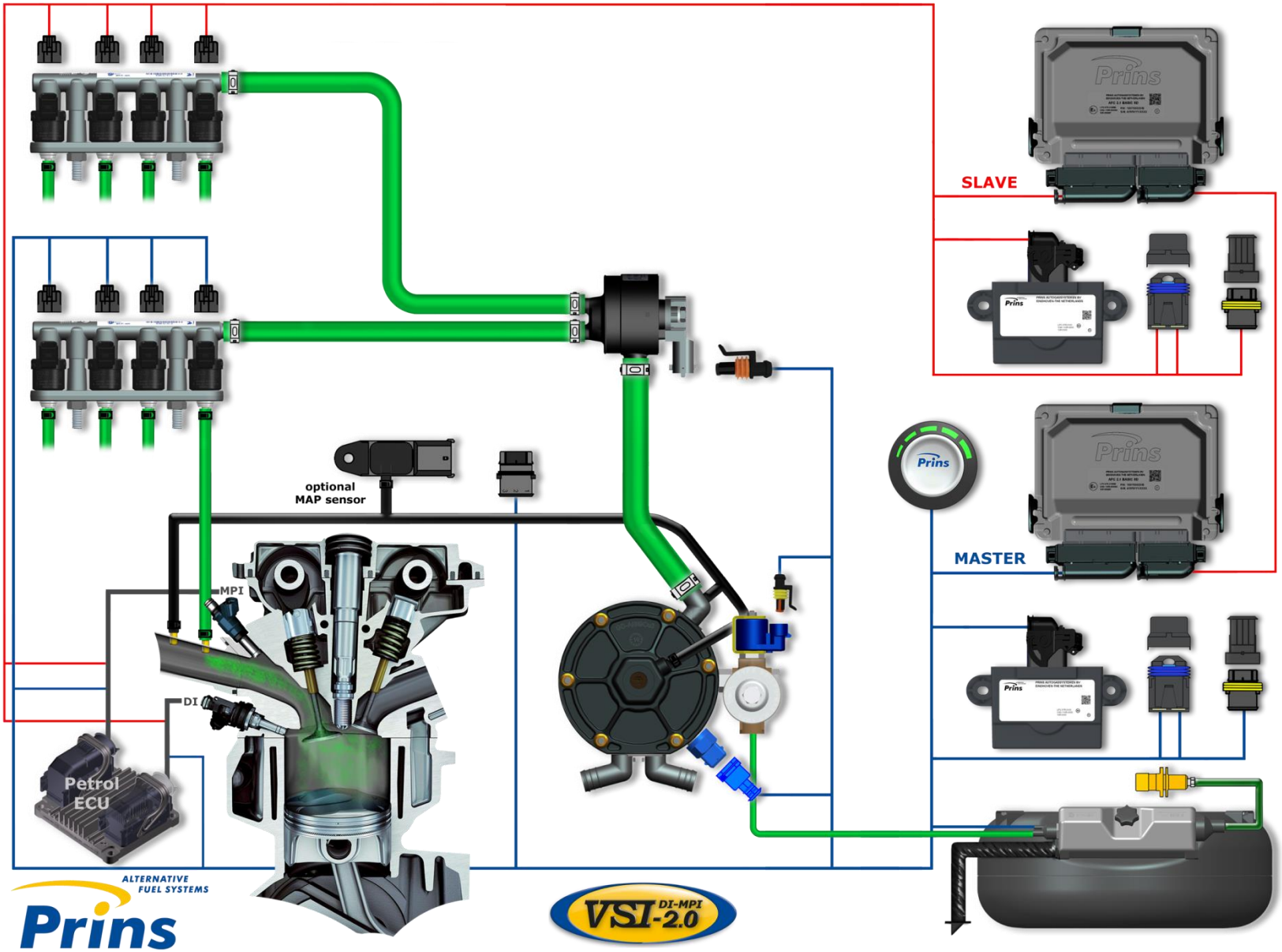
VSI-DI-MPI LPG Basic system overview 4 cylinder



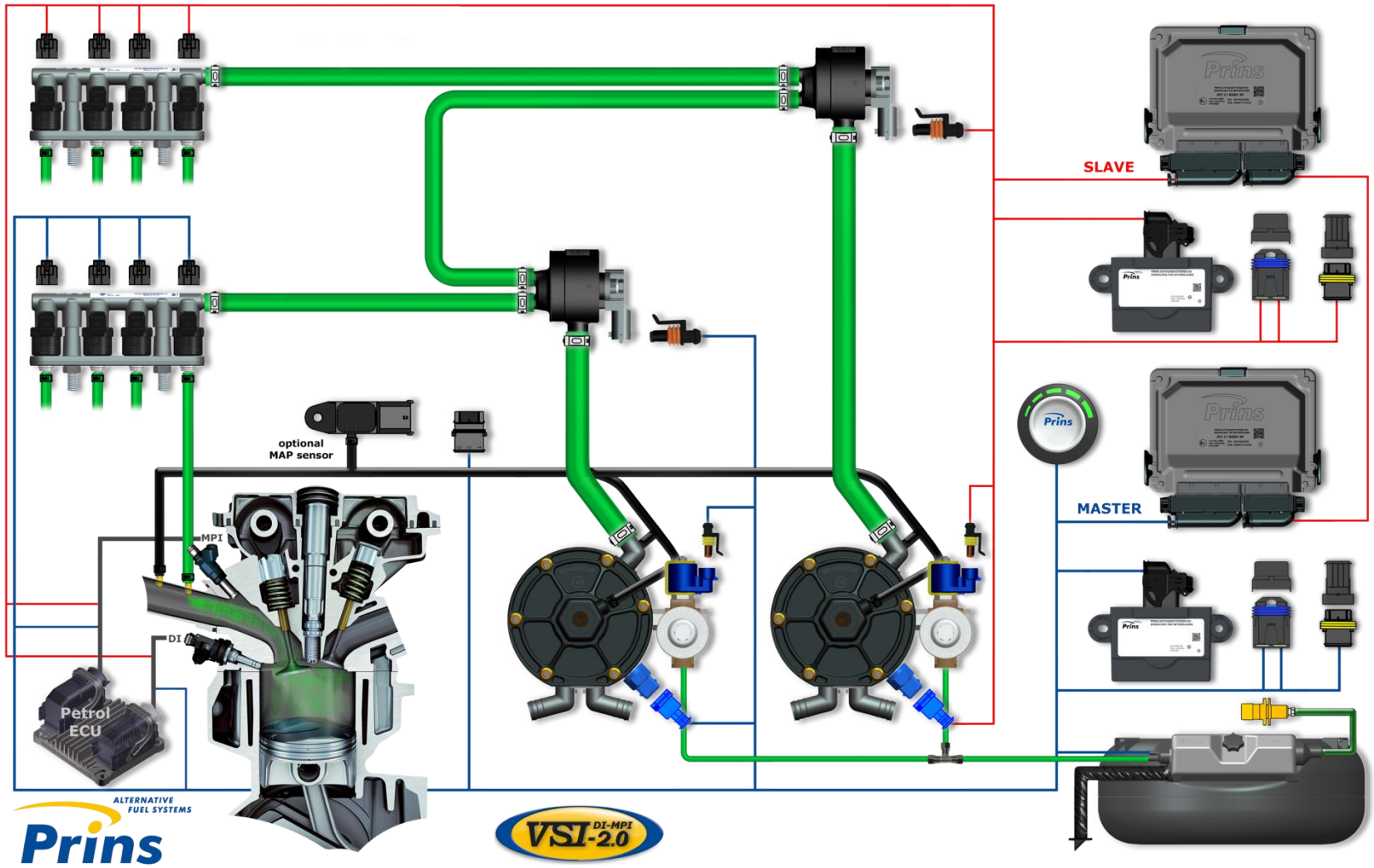
VSI-DI-MPI LPG Basic system overview **6 cylinder**



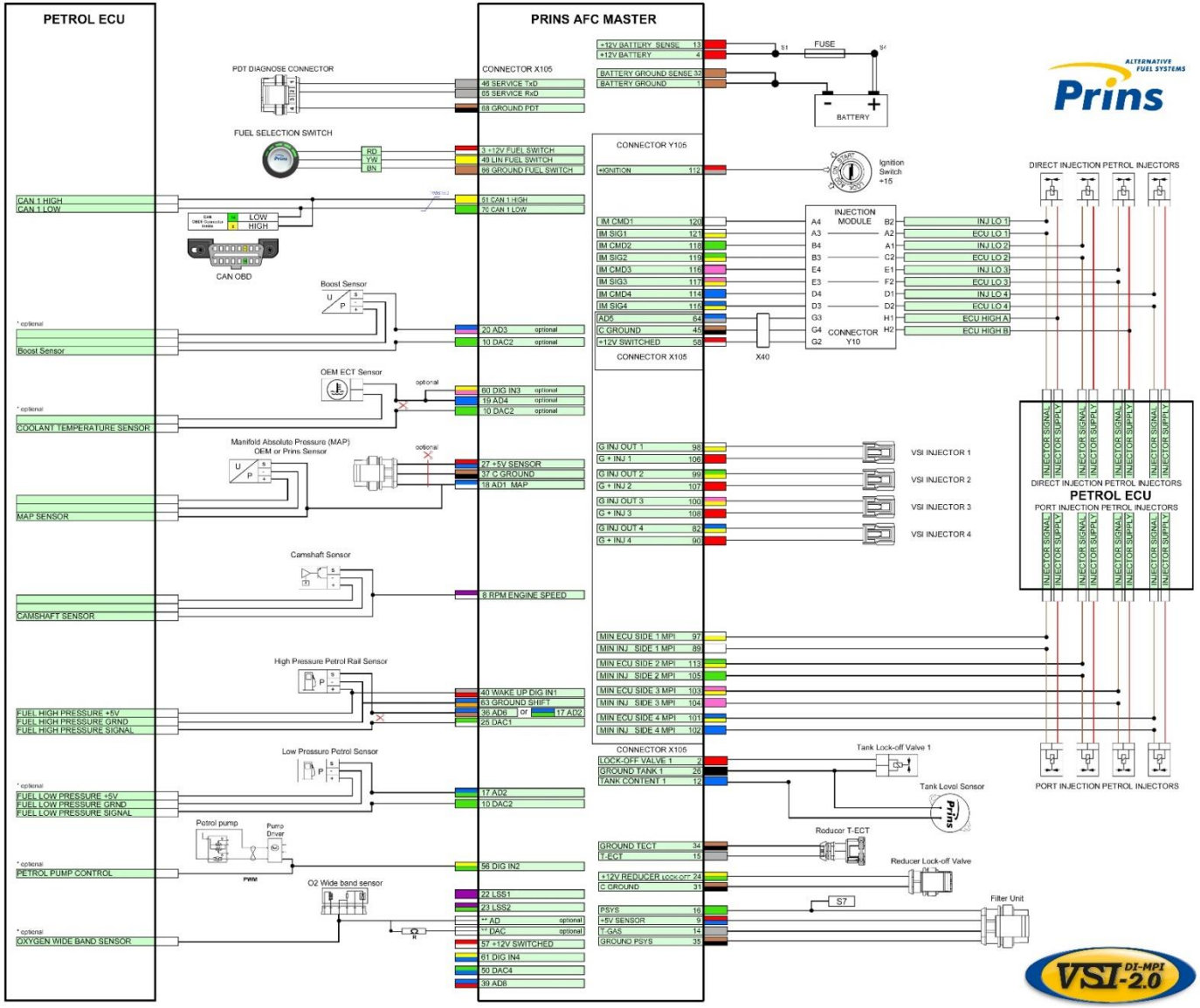
VSI-DI-MPI LPG Basic system overview 8 cylinder



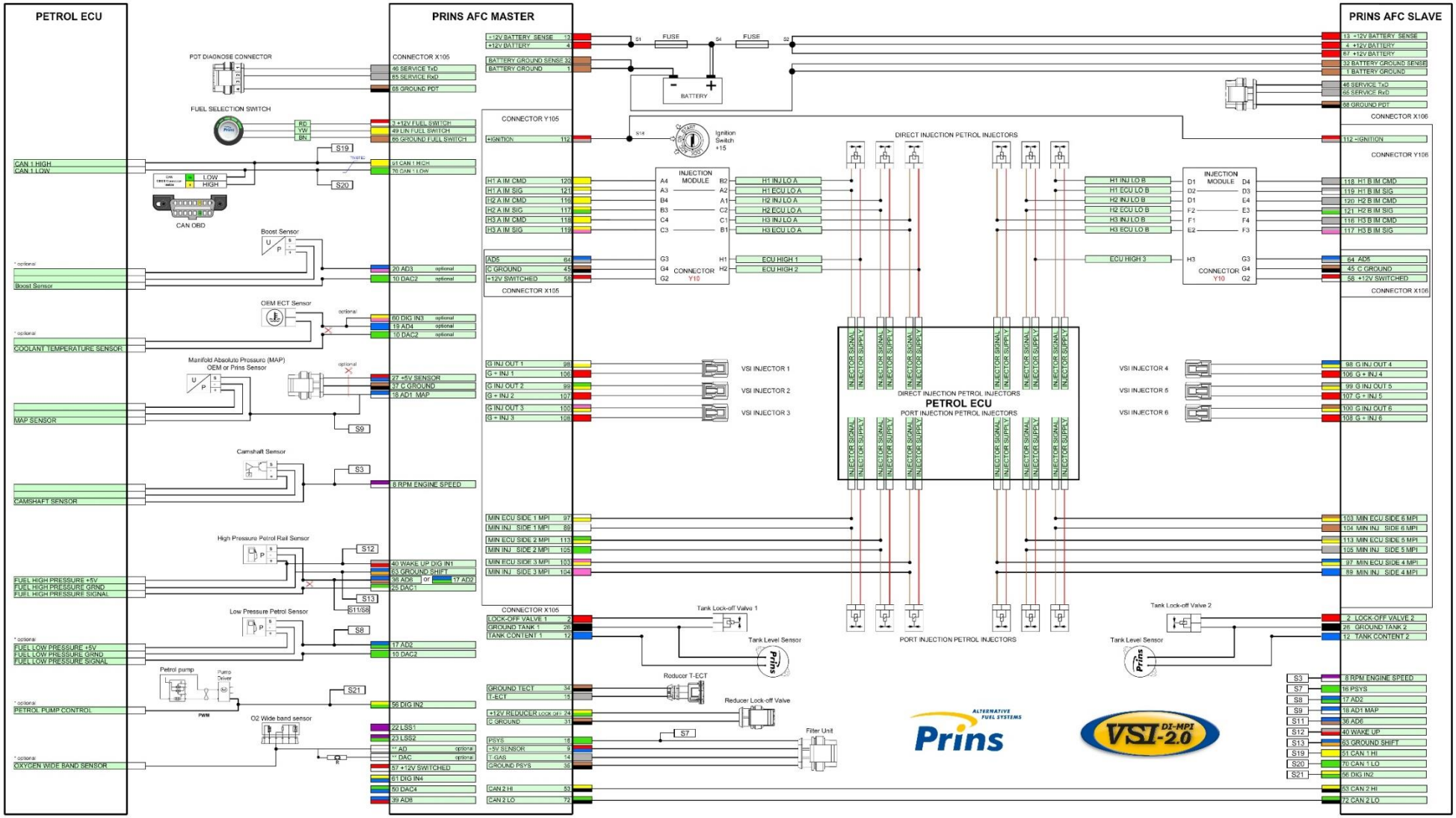
VSI-DI-MPI LPG Basic system overview **8 cylinder High Output**



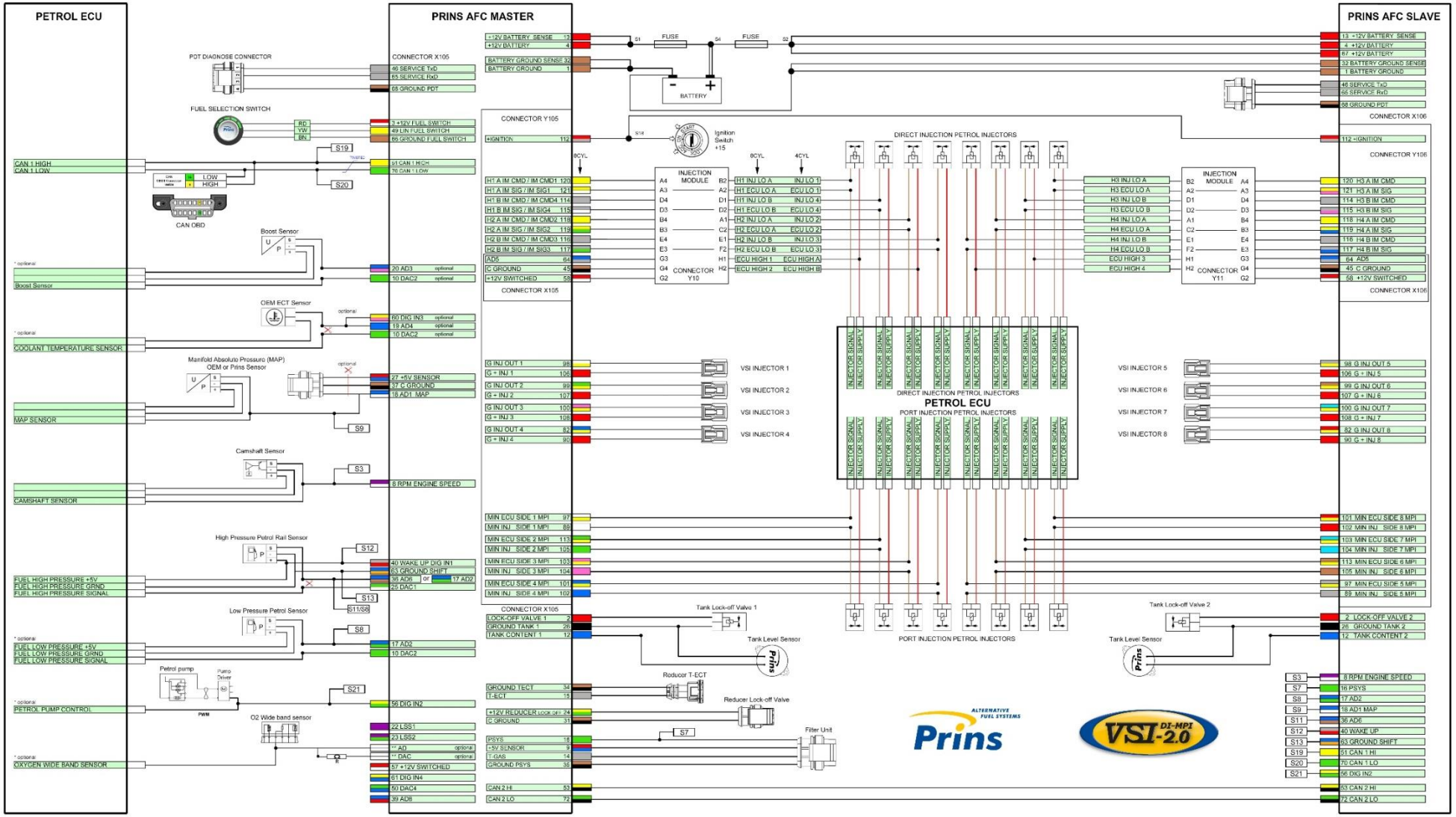
VSI-DI-MPI LPG Basic Wiring Diagram 4 cylinder



VSI-DI-MPI LPG Basic Wiring Diagram 6 cylinder



VSI-DI-MPI LPG Basic Wiring Diagram 8 cylinder



Trouble code chart VSI-I LPG

Trouble code	Definition		Check / solution
100	Lambda to long to rich.		Check when operating on petrol and LPG that there is good lambda signal movement.
101	Lambda to long to lean.		Check when operating on petrol and LPG that there is good lambda signal movement.
102	Lambda to long to lean during open loop.		Check when operating on petrol and LPG that there is good lambda signal movement.
110	T-ECT>= 171°C		Check if the ECT sensor (blue) in the reducer is connector is connected to ground.
111	T-ECT>= -40°C		Check if the ECT sensor (blue) in the reducer has a power connection.
120	T-LPG>= 171°C		Check the ground connection of the Pressure/temperature sensor in the filter unit.
121	T-LPG>= -40°C		Check the power connection of the Pressure/temperature sensor in the filter unit.
150	Psys<= Low_Level		Based on a pressure drop in the system, this can be caused by an empty LPG tank, incorrect solenoid valve, polluted filter or incorrectly adjusted pressure.
160	ECM-VSI not activated		Activate the LPG computer with the diagnostic program, using the F11 function key.
180	T-Board >= 90°C		LPG computer circuit board to hot, replace the VSI computer in a cooler area.
181	Battery voltage to high		Check board voltage / alternator output and condition of the battery.
210-220-230-240-250-260-270-280		VSI injector overload	Injector current to high, check for short circuiting
211-221-231-241-251-261-271-281		VSI injector noload	Injector current to low, check for bad connections.
310	Adjusted pressure on idle out of range		Adjust the idle pressure to the value shown by parameter " Idle Level "
311	Programm error during flahing the memory		Check parameter settings, contact Prins Autogassystemen.
320	Psys voltage to low		Check the ground connection of the Pressure/temperature sensor in the filter unit.
321	Psys voltage to high		Check the power connection of the Pressure/temperature sensor in the filter unit.
322	Psys > 3,5 Bar		Check the coolant temperature (T-ect) and the evaporator for leakage of the first stage.
330	unexpected parameter change		Contact Prins Autogassystemen.
340	reducer warms up to slow		Check the water connections / circuit.
341	Gas leakage, system pressure is less then 1.25 bar after 4 hours when the engine is not running		Check the system for gas leakage.
div.	System switches to LPG but engine stalls immediately.		LPG tank empty ? Lock-off valves open ?
div.	No injection timing on LPG (0 Msec.)		Check the injection module.
div.	The LPG system switches constantly between LPG and Petrol		- Check coolant system for air. - T-ect sensor in the evaporator malfunction.
div.	Engine hesitates on high revs, and not running on all cylinders. Engine runs good on idle.		Check for kinked or jammed LPG hoses (between VSI injector and couplings). Check for blocked inlet couplings.
div.	Switch LED's don't lit up		Check the main fuse of the VSI system Check ignition+ (VSI wire 13)
div.	Fault codes when turning the ignition off (key out the ignition)		Caused by different switch off times between ignition+ and injector power. Connect VSI wire 13 to the petrol injector feed instead of ignition+.
div.	The orange LED on the switch flashes		Activate the LPG computer with the diagnostic program, using the F11 function key.
div.	The LPG system switches to LPG but engine stalls immediately		LPG tank empty?
div.	Not running on all cylinders on lpg		Check parameter 10, number of cylinders.
div.	No injection times on lpg		Check the connections of the injection module.
div.	Injection time "falls" to 0 mSec on LPG		Check the injection module.
div.	Check engine while running on LPG, injector circuit malfunction, no lambda control (limb home)		Replace injection module
div.	Not starting / running on petrol		Check the connections of the injection module.

Maintenance instructions

When you drive on LPG/CNG, maintaining your car is even more important than when using petrol. Since the specifications of LPG/CNG differ from those of petrol, minor engine problems which won't disturb the driving comfort while using petrol, may cause major problems while using CNG. Follow the maintenance instructions in order to use LPG/CNG without any problem.

- General maintenance to the car regarding spark plugs, spark plug cables, ignition circuit, valves, etc., has to be carried out according to the instructions of the car manufacturer.
- Proof of maintenance according to the guidelines of the importer is obligatory (completely filled in maintenance booklet).
- Maintenance has to be carried out by a dealer authorised by the importer.
- Adjustments and repairs on your Prins VSI- system should only be carried out by a dealer authorised by Prins Autogassystemen B.V.

MAINTENANCE AND SERVICE

Registration of maintenance and service of the VSI-LPG system.

	25.000 km or after 2 years	**100.000 km** or after 2 years	**175.000 km** or after 2 years	**250.000 km** or after 2 years
Checklist executed services:				
Lock off valve filter replacement*	❑	❑	❑	❑
Filter unit filter replacement*	❑	❑	❑	❑
Hoses + filling hoses checked	❑	❑	❑	❑
Fastening of components checked	❑	❑	❑	❑
Electrical connection + wiring checked	❑	❑	❑	❑
Checked for fuel leakage	❑	❑	❑	❑
Checked for trouble codes (petrol and LPG) + system pressure	❑	❑	❑	❑
Checked for exhaust emissions	❑	❑	❑	❑
Tightening torque of the allen screws of the reducer checked at 8Nm	❑	❑	❑	❑
	Number of kilometres: Date:	Number of kilometres: Date:	Number of kilometres: Date:	Number of kilometres: Date:

Dealer stamp

*The service intervals of the filter replacements may be divergent because of the variable LPG quality. Ask your Prins dealer for more information.

Registration of maintenance and service of the VSI-CNG system.

	25.000 km or after 2 years	**100.000 km** or after 2 years	**175.000 km** or after 2 years	**250.000 km** or after 2 years
Checklist executed services:				
Keihin inlet filter replacement*	❑	❑	❑	❑
Filter unit filter replacement*	❑	❑	❑	❑
Hoses + pipes checked	❑	❑	❑	❑
Fastening of components checked	❑	❑	❑	❑
Electrical connection + wiring checked	❑	❑	❑	❑
Checked for fuel leakage	❑	❑	❑	❑
Checked for trouble codes (petrol and CNG) + system pressure	❑	❑	❑	❑
Checked for exhaust emissions	❑	❑	❑	❑
	Number of kilometres: Date:	Number of kilometres: Date:	Number of kilometres: Date:	Number of kilometres: Date:

Dealer stamp

*The service intervals of the filter replacements may be divergent because of the variable CNG quality. Ask your Prins dealer for more information.

Installation of the LPG container general manual

GENERAL REGULATIONS FITTING A LPG CONTAINER

The requirements of Regulation No. 67-01 series, concerning the fixation of the LPG container(s) shall be deemed to be met if the container is secured to the vehicle by at least:

- The LPG container shall be permanently installed in the vehicle and shall not be installed in the engine compartment.
- The LPG container shall be installed in the correct position, according to the instructions from the container manufacturer.
- The LPG container shall be installed such that there is no metal to metal contact, other than at the permanent fixing points of the container.
- The LPG container shall have permanent fixing points to secure it to the vehicle or the container shall be secured to the vehicle by a container frame and container straps.
- When the vehicle is ready for use the LPG container shall not be less than 200 mm above the road surface, unless:
  the container is adequately protected, at the front and the sides and no part of the container is located lower than this protective vehicle structure.
- No component of the LPG installation shall project beyond the external surface of the vehicle for more than 10 mm.
- No component of the LPG installation shall be located within 100 mm of the exhaust or a similar heat source, unless such components are adequately shielded against heat.
- No component of the LPG installation, except the container, may extend beyond the lower edge of the vehicle unless another part of the vehicle, within a radius of 150 mm, is situated lower.
- If more than one LPG container is connected to a single delivery tube each container shall be fitted with a non-return valve installed downstream of the remotely controlled service valve and a tube pressure relief valve shall be installed in the delivery tube, downstream of the non-return valve. An adequate filter system has to be placed upstream of the non-return valve(s) to prevent fouling of the non-return valve(s).
- The LPG-system shall be installed such that is has the best possible protection against damage, such as damage due to moving vehicle components, collision, grit or due to the loading or unloading of the vehicle or the shifting of those loads.
- All electrical connections shall be soldered and insulated.
- The LPG-system shall show no leaks.
- Certificates containers can be downloaded at www.prinsautogas.com

Installing a cylindrical container

- If the container is secured to the vehicle by a container frame and container straps, the container shall be secured to the container frame by at least two container straps (diagram 1).
- Install the frame with a minimum of four bolts (diagram 1).
- Appropriate washers or plates if the body panels at that location are single thickness (diagram 1).
- If the container straps also carry the mass of the fuel container, at least three container straps are necessary.
- The container straps shall ensure that the fuel container will not slide, rotate or be dislodged.
- A protective material such as felt, leather or plastic shall be interposed between the fuel container and the container straps.
  Locate the tension straps in such a way that the identification stickers remain visible.
- A tension strap has to be in contact with the tank over at least half the tank diameter, with a minimum of 15 centimetres.
- Assuming that the material grade is Fe 370, the fixing bolts shall be of class 8.8, and have the dimensions specified in diagram 1 below:

Container content [litres]	Minimum dimensions of the washers or plates [mm]	Minimum dimensions of the container straps [mm]	Minimum diameter of bolts Class 8.8 [mm]
up to 85	round: 30 x 1.5 round: 25 x 2.5	20 x 3 30 x 1.5	8
85 - 100	round: 30 x 1.5 round: 25 x 2.5	30 x 3 20 x 3 */	10 8 */
100 - 150	round: 50 x 2 round: 30 x 3	50 x 6 50 x 3 **/	12 10 **/
more than 150	shall meet the provisions of Regulation No. 67, 01 series of amendments, for LPG containers, or Regulation No. 110 for CNG containers		

Diagram 1

*/ In this case the container shall be secured by at least three container straps.
**/ In this case the container shall be secured by at least four container straps.

Cylindrical container installed longitudinally

- If the container is installed behind a seat, a total clearance of at least 100 mm, in the longitudinal direction of the vehicle, shall be provided. This clearance may be divided between the container and the rear panel of the vehicle and between the seat and the container (diagram 2).
- If the cylindrical container is installed longitudinally to the vehicle, a transverse connection shall be present at the front of the container frame which is:
  - at least of the same thickness as the container frame
  - at least 30 mm high and its top is at least 30 mm above the bottom of the container
  - as close as possible, or even within, the domed end of the container

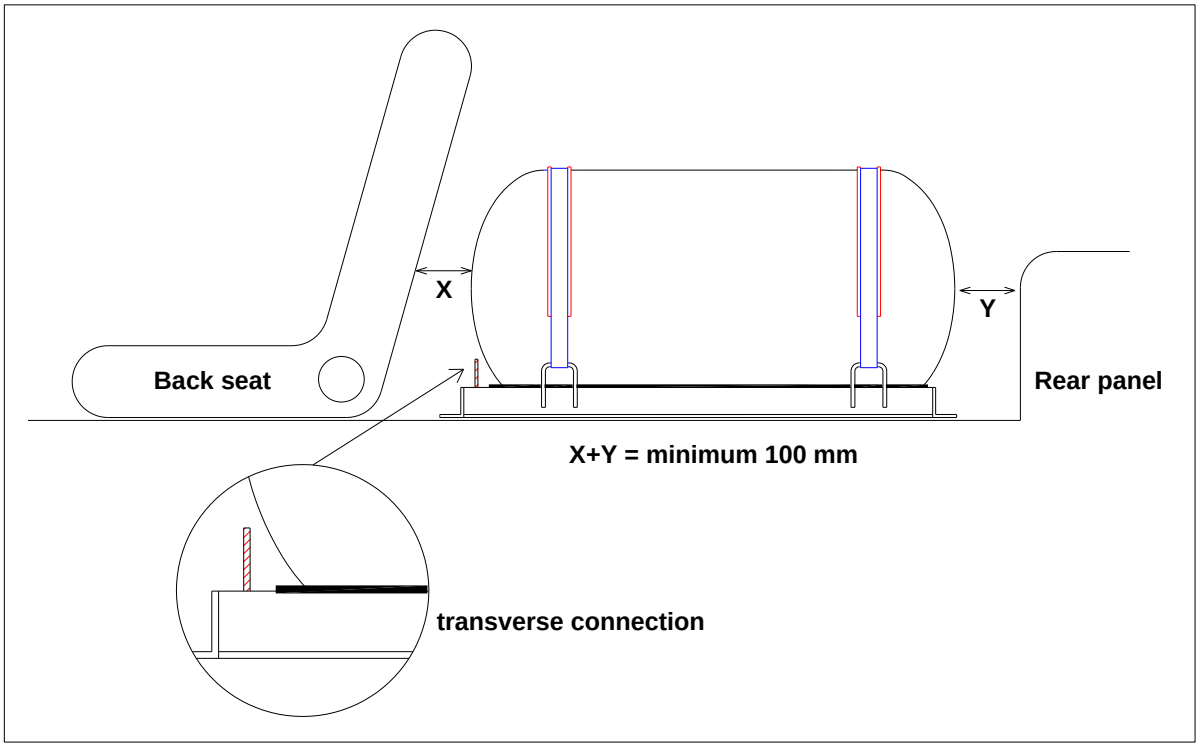


diagram 2

By "installed longitudinally" it is meant that the axis of the cylindrical fuel container makes an angle of no more than 30 degrees with the longitudinal centre plane of the vehicle.

Installing a toroidal container

Container installed into the spare-wheel room (flush-mounted):

- The LPG container shall be installed such that there is no metal to metal contact, other than at the permanent fixing points of the container.
- Installation of the container:
  - with frame or brackets (mounting points on top of the container).
  Frame/bracket material: minimum 4mm thick x 40mm wide.
  Use of Prins M8 certified M8 brackets
  (Prins Autogassystemen B.V. declares that the threaded ends, that have been delivered with a toroidal tank, are fitted with a threaded end M8 or M10 with strength class 8.8.)
  Other kinds of threaded ends may not be used with these mountings.

  - directly to the vehicle floor with bolts and washers / plates
  (with tank mounting points on the underside of the container) see diagram 1.

Example of brackets inside the vehicle

Container installed under the vehicle (sub-structure):

- The LPG container shall be installed such that there is no metal to metal contact, other than at the permanent fixing points of the container.
- When the vehicle is ready for use the LPG container shall not be less than 200 mm above the road surface, unless:
- the container is adequately protected, at the front and the sides and no part of the container is located lower than this protective vehicle structure.
- the container is installed in place of the original petrol tank and keeps at least the same height above the road.
- No component of the LPG installation shall be located within 100 mm of the exhaust or a similar heat source, unless such components are adequately shielded against heat.
- Installation of the container:
  - with a frame or brackets (mounting points on top of the container)
  Frame/bracket material: minimum 4mm thick x 40mm wide.
  - directly to the vehicle floor with bolts and washers / plates (mounting points on top of the container) see diagram 1.
- Treat the LPG tank when mounted with a black body coating.

Installing the LPG fuel line and filling unit

- It is not permitted to have LPG tubes routed through the passenger compartment or a closed cargo space.
- Note the jack supporting points and moveable parts when mounting the LPG line.
- Remove the inner burrs after shortening the LPG line (to prevent the flow from being reduced).
- The number of joints shall be limited to a minimum.
- In a passenger compartment or enclosed luggage compartment the gas tube or hose shall be no longer than reasonably required; this provision is fulfilled when the gas tube or hose does not extend further than from the fuel container to the side of vehicle.
- There shall be no gas-conveying connections in the passenger compartment or enclosed luggage compartment with the exception of:
  the connections on the gas-tight housing;
  and the connection between the gas tube or hose and the filling unit if this connection is fitted with a sleeve which is resistant against LPG and any leaking gas will be discharged directly into the atmosphere.
- The filling unit shall be secured against rotation and shall be protected against dirt and water.
- The filling unit is connected to the container by a hose or pipe.
- When the LPG container is installed in the passenger compartment or an enclosed (luggage) compartment, the filling unit shall be located at the outside of the vehicle.

Accessories of the LPG container

Remote controlled valve with excess flow valve on the container

The remotely controlled service valve with excess flow valve shall be installed directly on the fuel container, without any intervening fittings.
The remotely controlled service valve with excess flow valve shall be controlled such that it is automatically closed when the engine is not running, irrespective of the position of the ignition switch, and shall remain closed as long as the engine is not running.

Spring-loaded pressure relief valve in the container
The spring-loaded pressure relief valve shall be installed in the fuel container in such a manner that it is connected to the vapour space and can discharge to the surrounding atmosphere. The spring-loaded pressure relief valve may discharge into the gas-tight housing if that gas-tight housing fulfils the requirements of paragraph

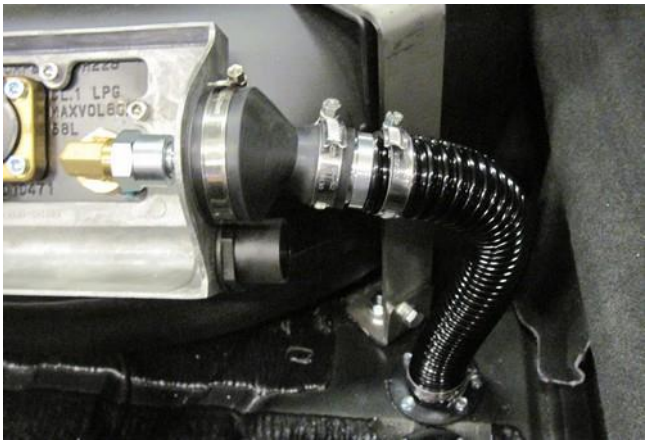
80 % stop valve
The automatic filling level limiter shall be suitable for the fuel container it is fitted to and shall be installed in the appropriate position to ensure that the container cannot be filled to more than 80 per cent.

Level indicator
The level indicator shall be suitable for the fuel container it is fitted to and shall be installed in the appropriate position.

Gas-tight housing on the container
A gas-tight housing over the container fittings shall be fitted to the fuel container, unless the container is installed outside the vehicle and the container fittings are protected against dirt and water.

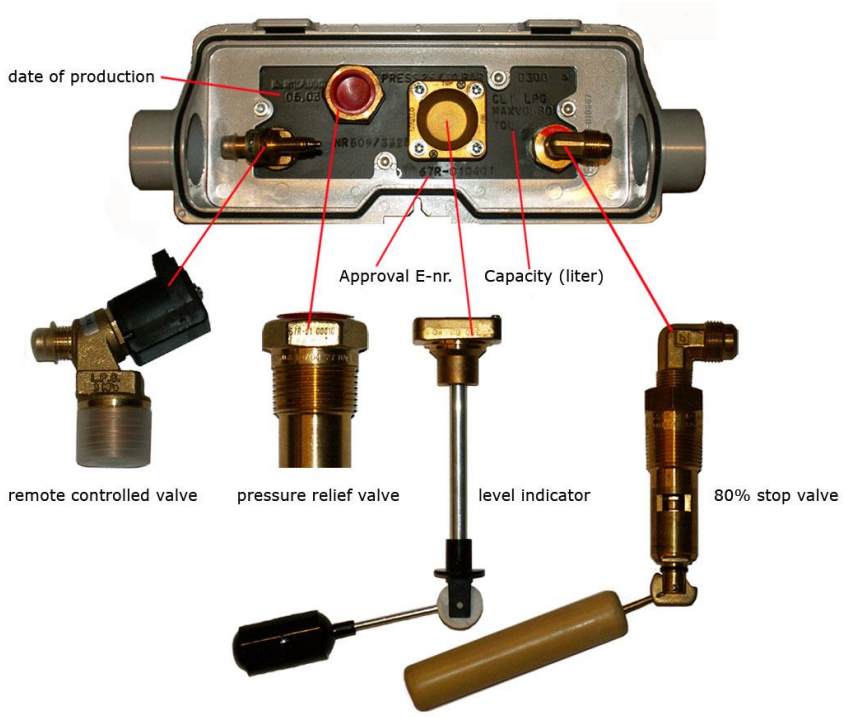
The gas-tight housing shall be in open connection with the atmosphere, where necessary through a connecting hose and a lead-through.

The ventilation opening of the gas-tight housing shall point downwards at the point of exit from the motor vehicle. However, it shall not discharge into a wheel arch, nor shall it be aimed at a heat source such as the exhaust.

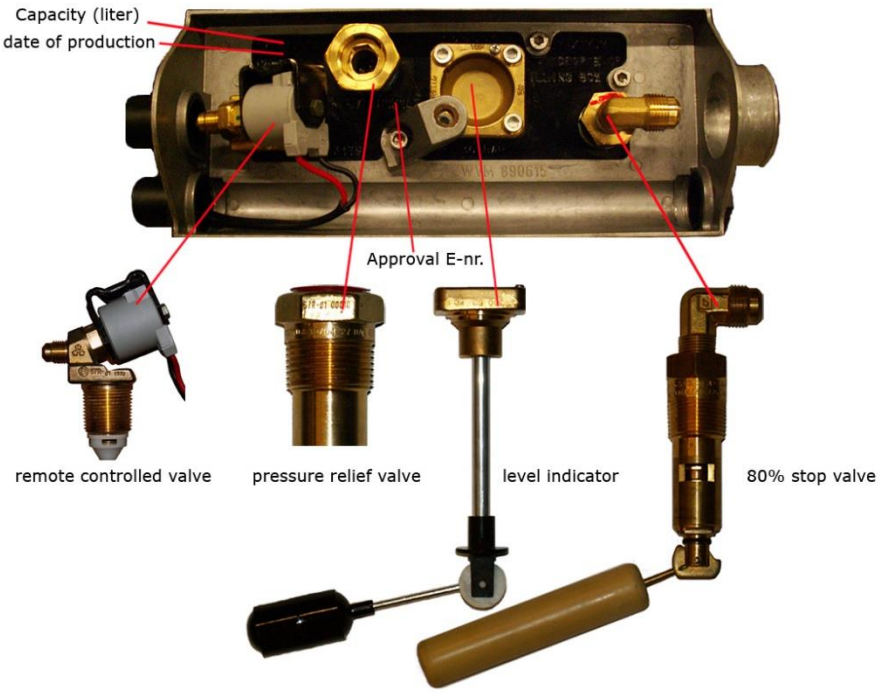


Any connecting hose and lead-through in the bottom of the bodywork of the motor vehicle for ventilation of the gas-tight housing shall have a minimum clear opening of 450 mm^2. If a gas tube, other tube or any electrical wiring is installed in the connecting hose and lead-through, the clear opening shall also be at least 450 mm^2.

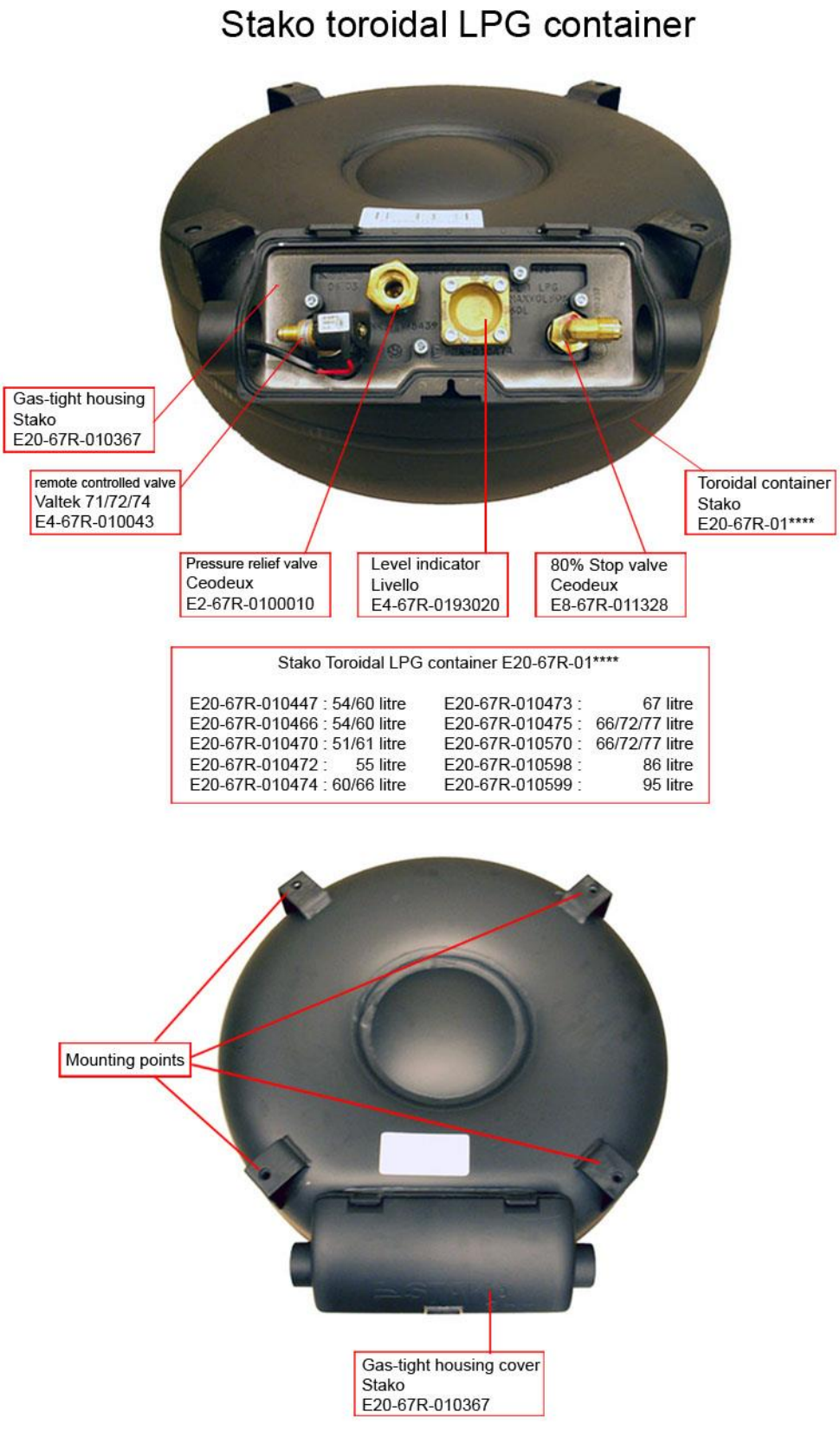
Stako container accessories



WvM container accessories

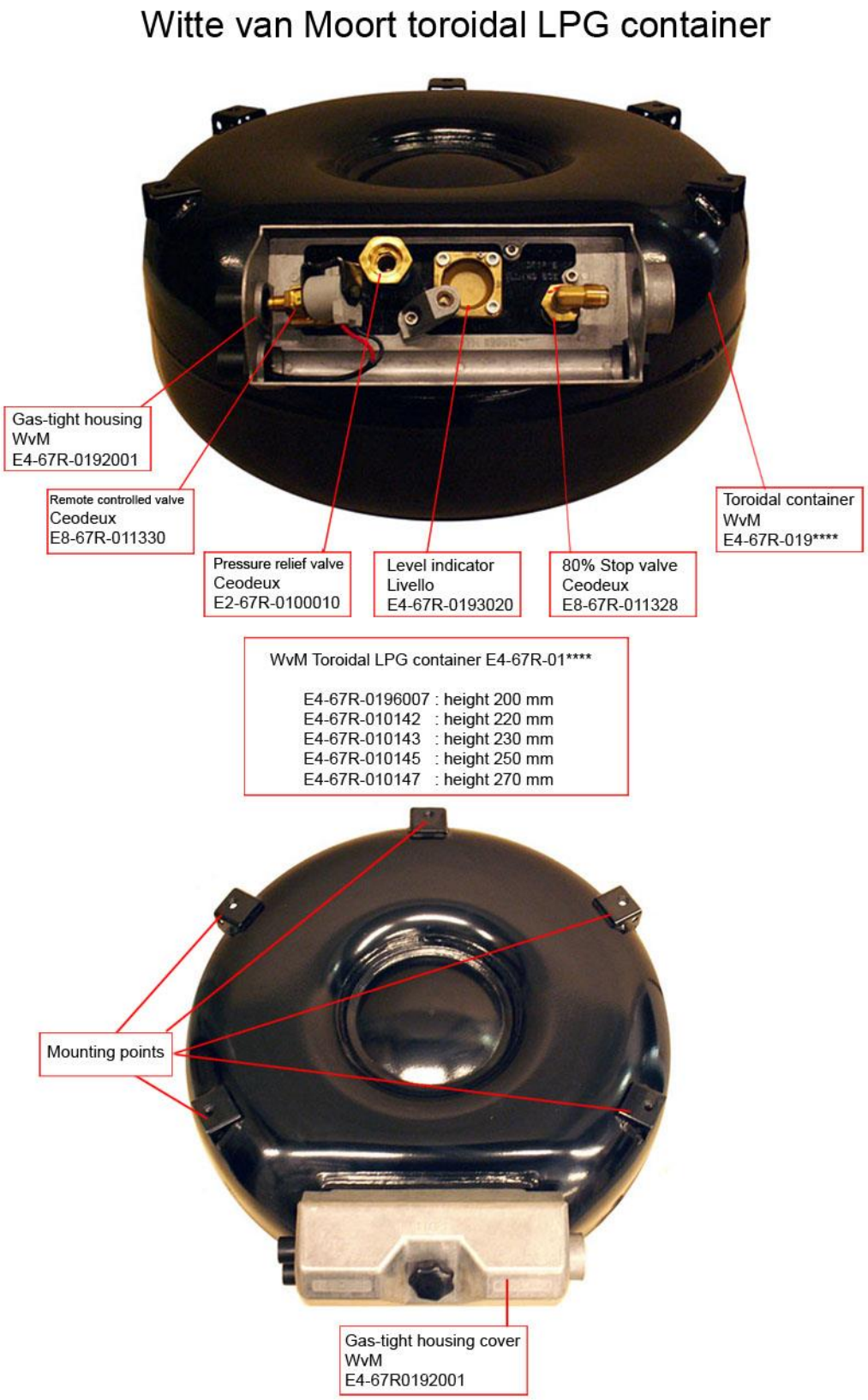


Stako toroidal container

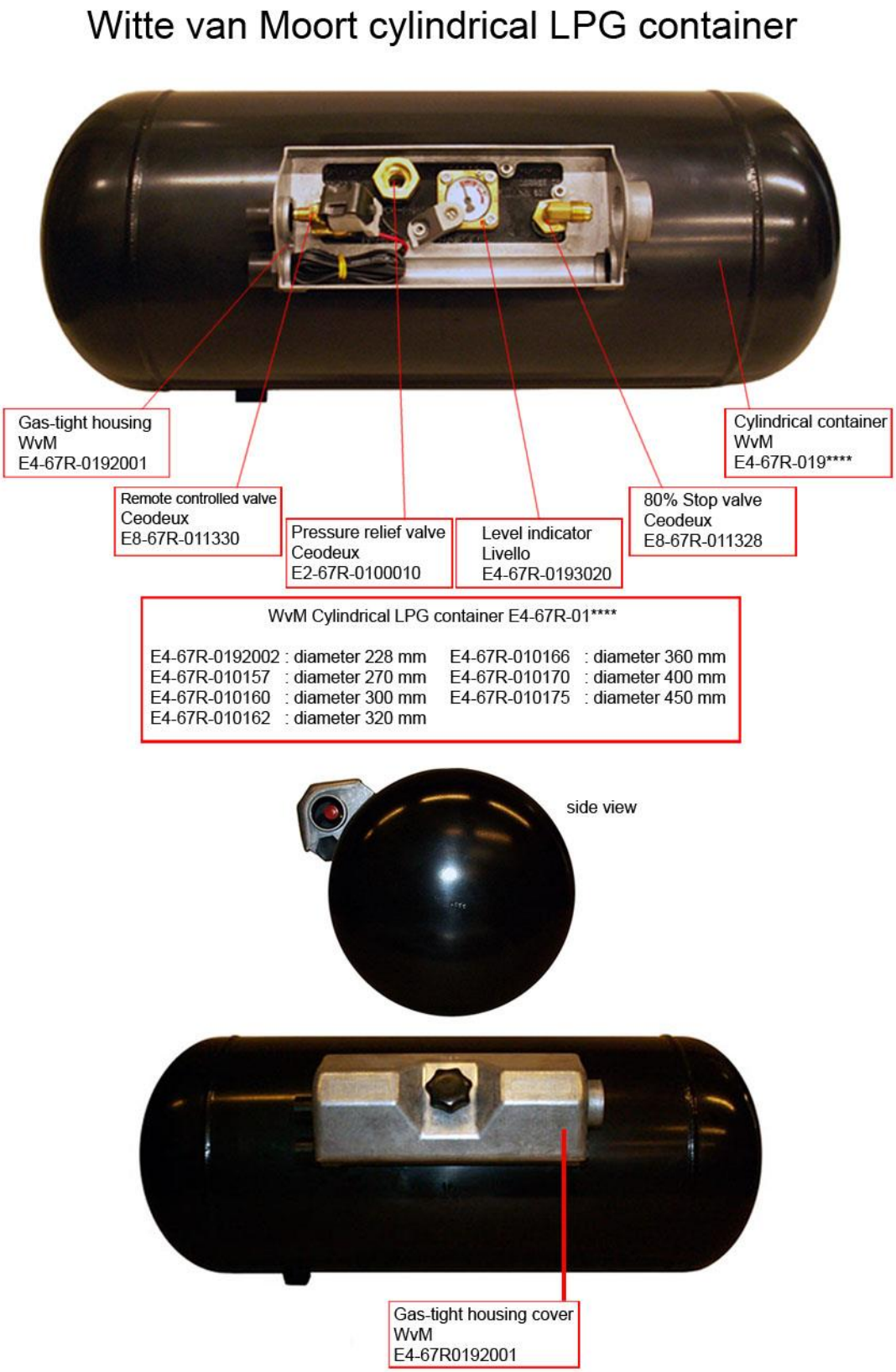


Stako cylindrical container

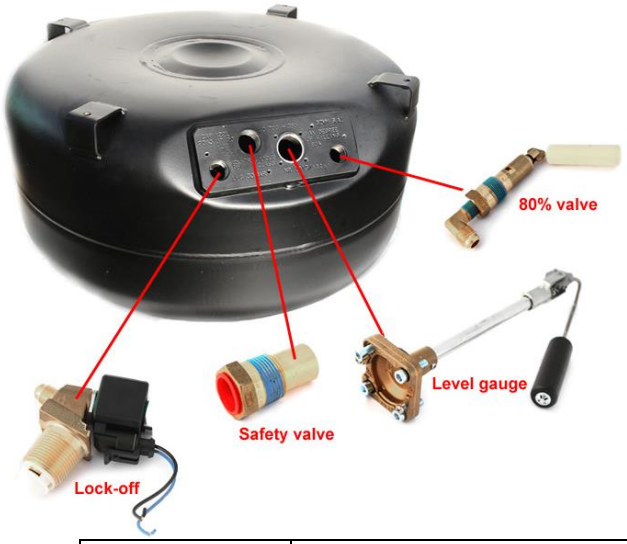
Witte van Moort toroidal container



Witte van Moort cylindrical container



GZWM Toroidal & cylinder container



Tank type	Approval number tank	Diameter (Ømm)	Hole
Cylinder	E20-67R-01-0611	D=315	4
Cylinder	E20-67R-010612	D=360	4
Cylinder	E20-67R-010796	D=450	4
Cylinder	E20-67R-010612	D=360	4
Cylinder	E20-67R-010796	D=450	4
Toroidal	E20-67R-011009	H=350	4
Toroidal	E20-67R-010617	H=230	4
Toroidal	E20-67R-010618	H=250	4
Toroidal	E20-67R-010700	H=270	4
Toroidal	E20-67R-010783	H=270	4
Toroidal	E20-67R-010963	H=200	4
Toroidal	E20-67R-011009	H=350	4
Toroidal	E20-67R-010617	H=230	4

Approval numbers tank accessories:		
Lock-off Valve	Ceodeux 071307	E20-67R-010711
	Ceodeux 071307 – option	E8-67R-011330
	Valtek 74 – option	E4-67R-010043
	OMB B3 – option	E8-67R-014449
Safety Valve	Ceodeux 070770	E2-67R-0100010
Level Gauge	Shramifa (Livello) L1	E4-67R-0193020
	SRG (497 serie) – option	E4-67R-010038
80% Valve	Ceodex 070116	E8-67R-011328
	OMB Type 4B – option	E8-67R-010216

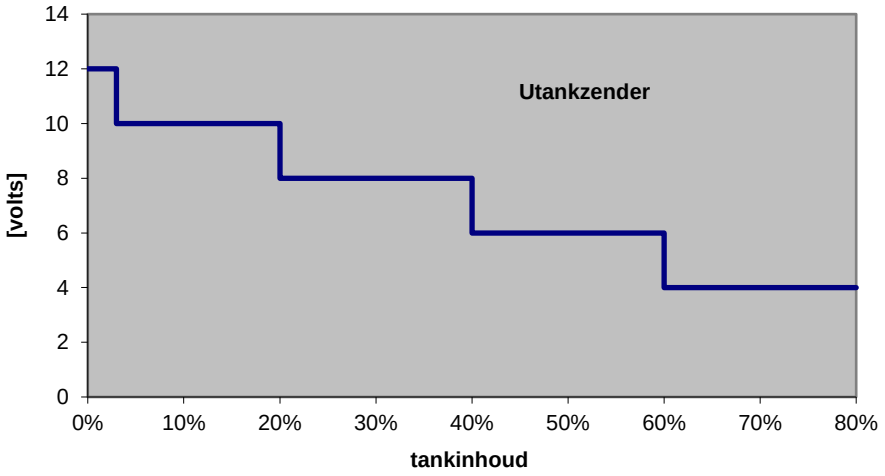
Approval numbers (optional) gas tight housing:	
GZWM OP-280	E20-67R-010711
Del Al Type D – option	E4-67R-010103

Tank coupler

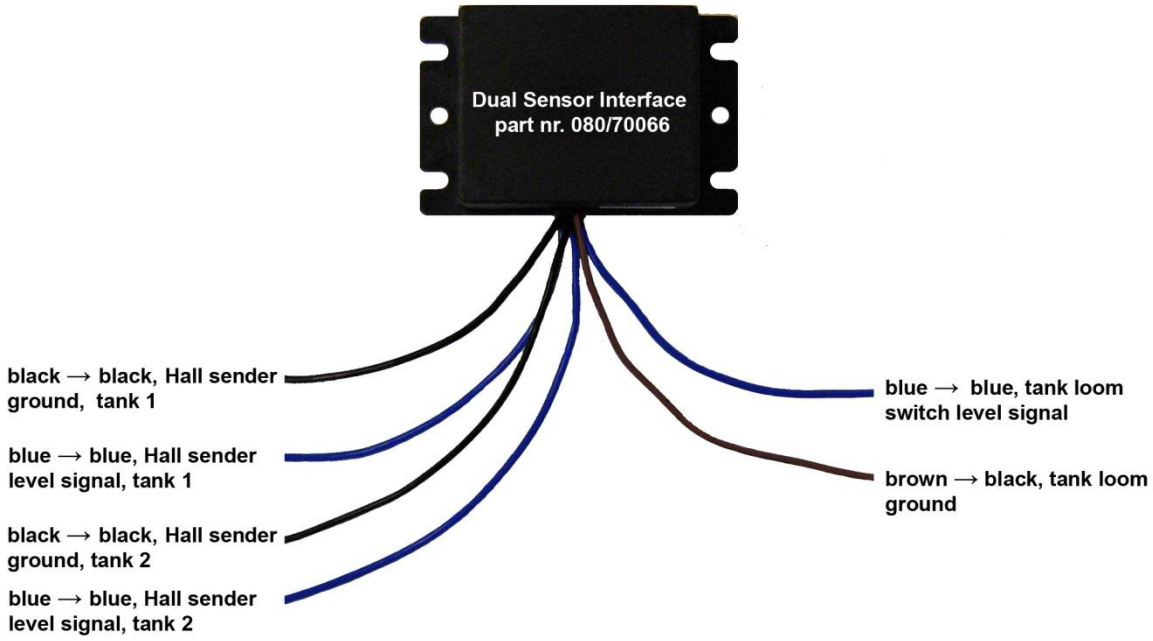
This unit is specially designed and tested according R67R-01 (chapter 17.5) test procedures to connect multiple tanks.

Hall sender

The fuel level in the reservoir is measured by a hall sensor mounted to the reservoir. This sensor informs the computer on the actual reservoir level, in five voltage levels. Switching from the one to the other level results in hysteresis. This implies that at the transition between 40 and 60% of the level, the 60% LED will extinguish as soon as the reservoir level is measured lower than 40% for some time. In this way, changes in indication when driving through a curve (fuel level at the position of sensor becomes lower temporarily) are prevented.
Refer to the diagram for the relation between the reservoir level and reservoir level sensor voltage generated by the reservoir level hall sensor.

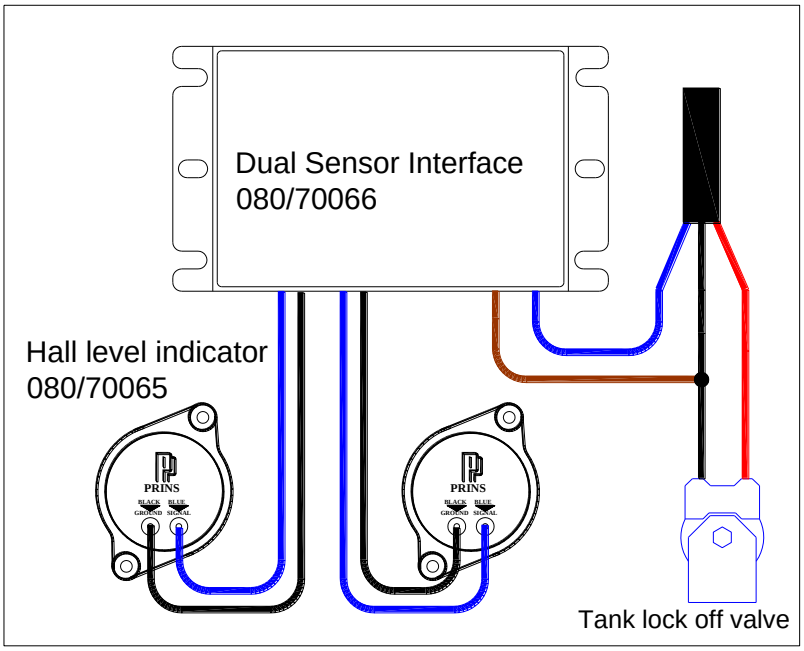


Dual sensor interface



Connect the interface wiring according to drawing, all blue and black wires are exchangeable since they are internally connected.

The DSI makes it possible to connect two level sensors to one lpg switch.
The DSI will always show the highest lpg level on the switch.



Filling Units

The filling unit shall be secured against rotation and shall be protected against dirt and water.

When the LPG container is installed in the passenger compartment or an enclosed (luggage) compartment, the filling unit shall be located at the outside of the vehicle.

The filling unit shall be equipped with at least one soft-seated non-return valve, and it shall not be dismountable by design.

The filling unit shall be protected against contamination.

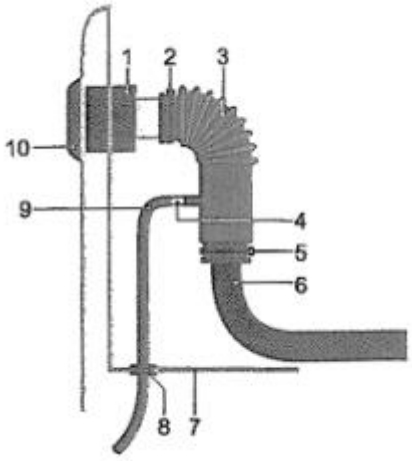
The outside filling unit is connected to the container by a rubber hose, XD hose or copper pipe.

There shall be no gas-conveying connections in the passenger compartment or enclosed luggage compartment with the exception of:
(i) the connections on the gas-tight housing; and
(ii) the connection between the gas tube or hose and the filling unit if this connection is fitted with a **sleeve** which is resistant against LPG and any leaking gas will be discharged directly into the atmosphere.

EN **The purpose of the rubber sleeve is to get rid of eventual leaking gas**

1	Filler housing	6	Filler hose
2	Cable tie	7	Bodywork
3	Rubber sleeve	8	Grommet in hole Ø14
4	Hose adaptor	9	Hose
5	Cable tie	10	External filler

- Slide the rubber sleeve over the filler hose
- Assemble the filler hose at the external filler
- Drill a hole Ø14mm in the area of the external filler and fit the grommet inside
- Slide the hose covering over the filler coupling
- Assemble the 4mm hose with the hose adapter
- Bring the hose to size and feed it through the grommet
- Use the Ø30mm grommet as an inspection gap in the covering panel. To make sure the connections can be checked easely (for in case the filler housing is assembled behind a difficult to remove panel)



Bayonet filling unit

90° connection

straight connection

E8-67R-011329

ACME filling unit

90° connection

straight connection

E8-67R-011329

Homologation no.

Dish filling unit (Italian)

Flat 90° connection

Flat straight connection

E8-67R-012481

Homologation no.

Euro filler

90° connection

straight connection

E8-67R-010077

Homologation no.

Flat filler

90° connection

straight connection

E8-67R-010023

Homologation no.

Bayonet

ACME

Dish

Euro

Korean / Japanese

Eurasian

Adaptors

Mini filler Ceodeux

straight connection

E13-67R-010300

Homologation no.

Bayonet | ACME | Dish | Euro | Korean / Japanese | Eurasian

Adaptors

Adapters per region

Fuel supply hose XD-3 / XD-4 / XD-5

XD Approval number E4-67R-010247

Minimum bending radius:
50mm XD-3 / 85mm XD-4
105mm XD-5 / 120mm XD-6
60mm XD-500-3

Filling hose XD

XD Approval number E4-67R-010247

Minimum bending radius: 120mm XD-6

Checklist after installation

1. Connect the serial interface cable and run the VSI diagnosis program.
   Install the VSI main fuse, and program the fuel switch.
   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/CNG system, you must activate the VSI computer with the diagnosis software. When the VSI-I computer has not been activated, it will keep generating error code 160. To activate the VSI-I computer, select function F11 (activate ECM). After activation erase fault code 160.

3. Check whether the program in the VSI computer matches with the car (dedicated engine set):
   Refer with F2 to the box number and car description in the diagnosis software and compare these with the set number.

4. The system will switch over to LPG/CNG as soon as the temperature of the coolant (T-ect) becomes higher than the parameter T-min set and when the TSO-cold time is expired.

5. Check all components and connections for any gas leakage (use a LPG/CNG leak detector device) or foam leak spray. Caution for moving and rotating parts in the engine compartment !

6. Let the engine run warm on petrol >80°C.
   Check if the evaporator/coolant water heats up.
   Check the engine signals: petrol injection time, RPM, ECT, lambda
   Let the engine run idle on LPG/CNG.
   Adjust the LPG evaporator pressure. Refer to the parameter list (or F2 : ID box) for the idle level value set.
   Adjust the LPG 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 to high.
   Seal the evaporator with the sticker included in the delivery after having adjusted the pressure.

7. Use the diagnosis software to check again all input and output signals.

8. Check the system for error codes and solve these, if required.
   Check the petrol MMS for EOBD error codes.
   Place the protection connector on the VSI communication connector.

9. Make a test drive and check the driveability on LPG/CNG and petrol.