ALTERNATIVE FUEL SYSTEMS

Prins

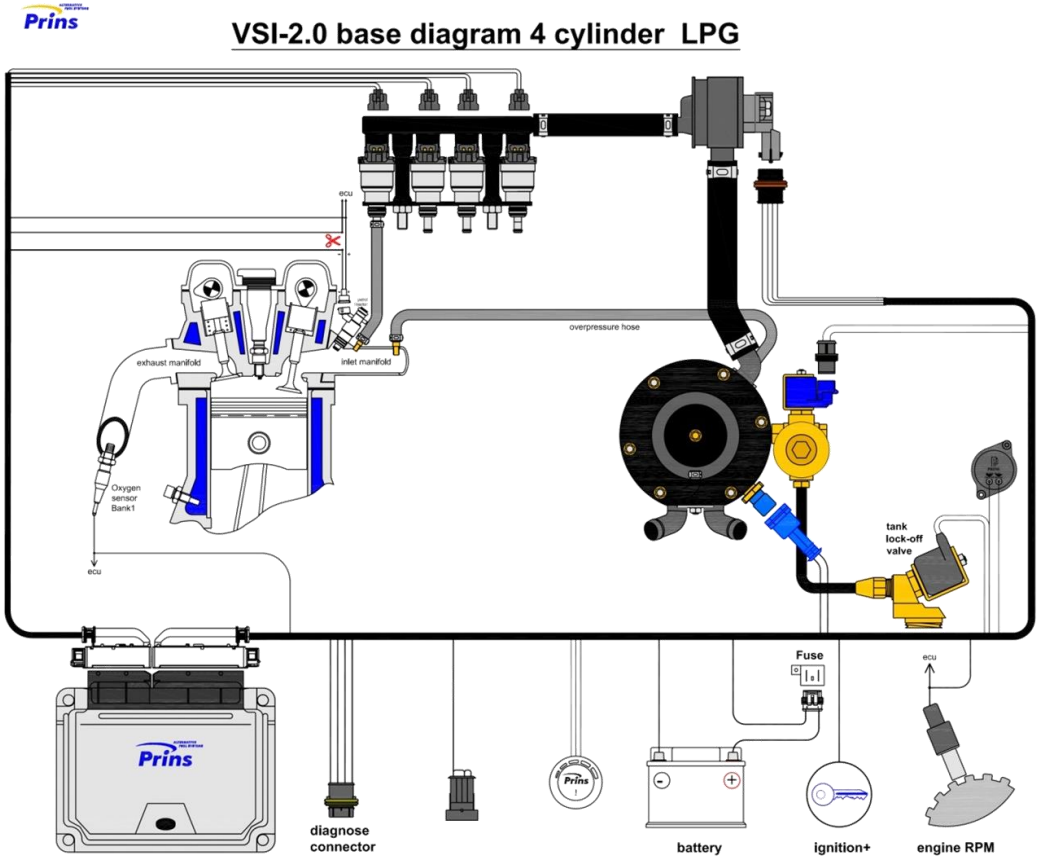
World leader in alternative fuel systems

Silverline specific components

VSI Silverline -2.0 LPG

SilverLine LPG-2.0

SilverLine-2.0 LPG System overview



Prins SilverLine injectorrail

LPG:

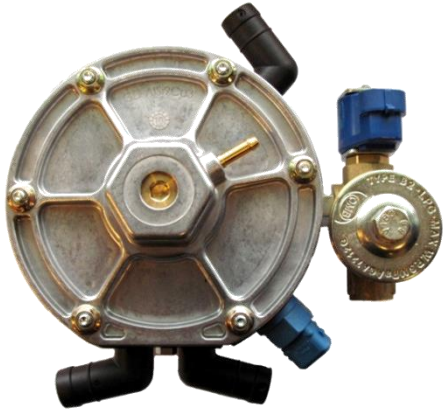
Injector size	Minimum power per cylinder [LPG]		Maximum power per cylinder [LPG]	
	KW	HP	KW	HP
42cc 2.0mm	9	12	15	20
51cc 2.2mm	13	18	20	27
62cc 2.4mm	18	24	27	37
74cc 3.0mm	25	33	35	47

CNG:

Injector size	Minimum power per cylinder [CNG]		Maximum power per cylinder [CNG]	
	KW	HP	KW	HP
42cc 2.0mm	7	10	12	16
51cc 2.2mm	10	14	16	22
62cc 2.4mm	14	24	27	36
74cc 3.0mm	20	27	28	38

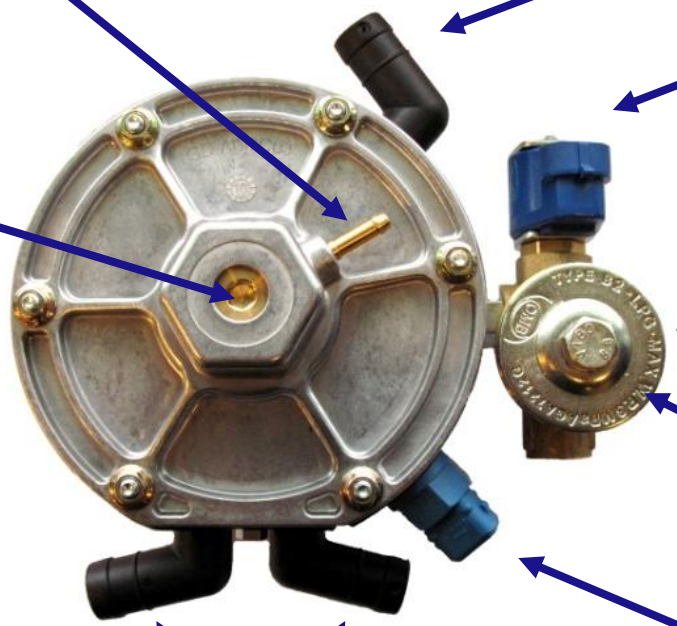
- **Instead of KN9 Silverline is using Prins injector**
- **Standard Prins 4 cylinder injector rail**
- **4 injector flow ranges**
  - Engine capacities from 9 kW up to 47 kW each cylinder.

Prins SilverLine Reducer



- Very stable dynamic pressure behavior
- System pressure control with single stage valve
- System pressure is independent to inlet pressure (MAP).
- Adjustable pressure: 1,7-2,6 Bar
- Integrated temperature sensor (NTC resistor R=2500 ohm at 20 °C)
- Pressure relief valve according to R67-01 regulations

Prins reducer



MAP connection

16mm gas output

System pressure adjusting screw

Water proof connetor

Lock off valve

Filter

Engine Coolant Temperature sensor

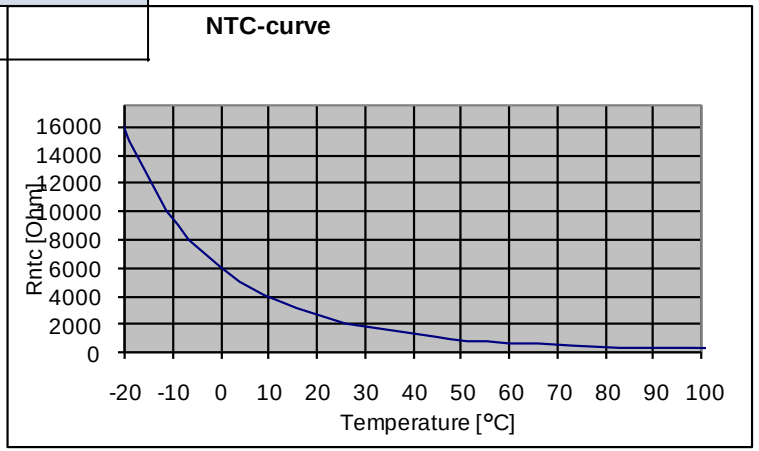
Rotatable 16mm water pipes

Prins AFC Compact Pro

- Ideal Solution for Price Sensitive markets
- Compact housing with 48-pins connector and integrated injector simulator with cylinder selective switching and valve saver functionalities
- Injector drivers based on “closed loop peak & hold current control”, different injector type settings pre-loaded
- Watertight casing IP69K with optimized heat balance control
- High performance 32-bit automotive controller combined with full diagnostics and protected I/O circuits for high reliability and durability
- CAN/K-line communication channels

Engine Coolant Temperature sensor (ECT)

R NTC [Ohm]	Temperature [C]
9400	-10
2500	20
325	80

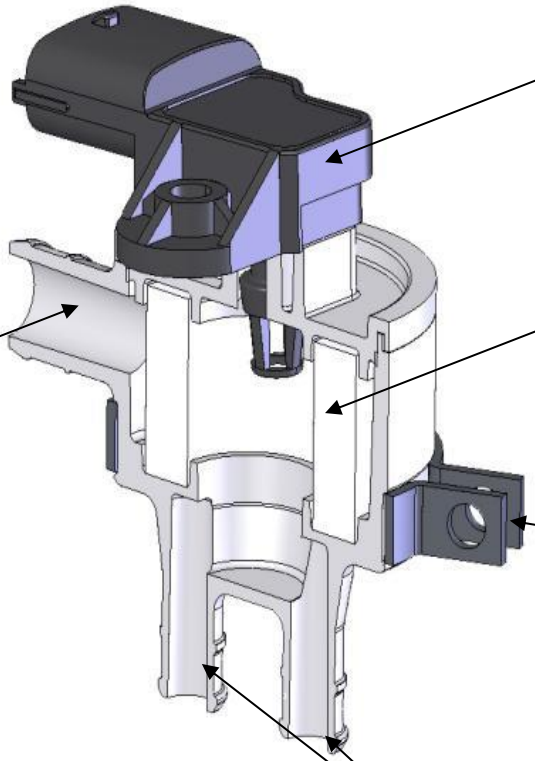


Description:

- Integrated in the coolant section of the evaporator
- Temperature sensor (based on NTC-resistance)
- Controls the switching over timing from petrol to LPG
- Monitoring flow

DTC nr	Description	Critical	Non-critical	Passive	Freeze frame	Possible solution
19	Regulator temperature signal too high	Yes			Yes	Check sensor signal wire for incorrect connection or short circuit to power supply.
20	Regulator temperature signal too low	Yes			Yes	Check sensor signal wire for incorrect connection or short circuit to ground.
129	Regulator water flow too low	Yes			Yes	Coolant flow is to low; check coolant connections and hoses.

Filterunit



Combined Psys and T-LPG sensor

Filter

Vaporous LPG input

Support

Vaporous LPG out

(engines with 2 injector rails only)

Filter Unit

- Lightweight nylon housing
  - high pressure resistance [max.25bar]
- Special glass fiber filter material [3µm]
- Max. oil trap 4-5 gram
- Light weight (0,11 kg)
- 16mm gas inlet
- 11mm outlet [single and double outlet versions]
- Filter element replacement:
  - First time after 25.000km
  - Sub sequential every 75.000km

Attention!

- For warranty the dealer who replaced the filter has to sign/stamp the service booklet/warranty portal!

Combined P/T sensor

The system pressure will be measured:

- To calculate corrections based on pressure fluctuations, thereby the VSI-system is not dependent of pressure fluctuation.

The LPG temperature will be measured because:

- The density of LPG is dependent of the LPG temperature. The colder the LPG the higher the density of the LPG. From 20 to 60˚C the energy flow to the engine will varied up to 12 %.
- Placed after the filter so that filter pollution has no influence on LPG quantity

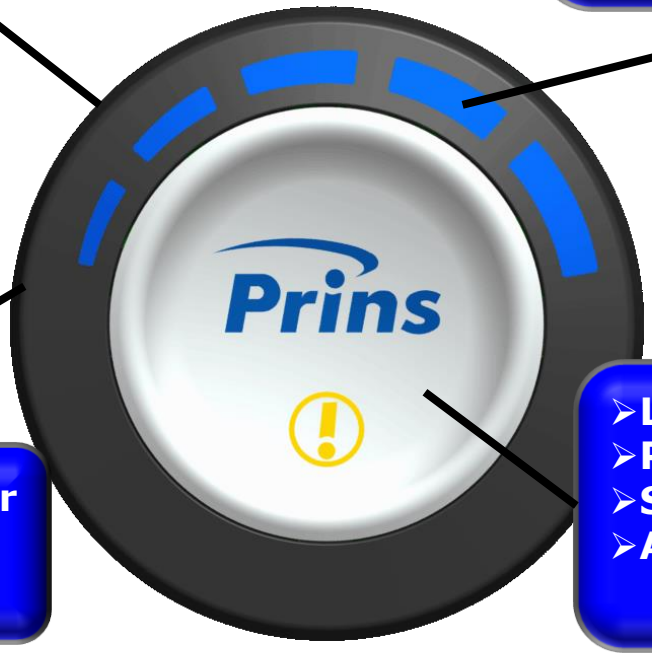
DTC nr	Description	Critical	Non-critical	Passive	Freeze frame	Possible solution
17	System pressure signal too high	Yes			Yes	Check sensor signal wire for incorrect connection or short circuit to power supply.
18	System pressure signal too low	Yes			Yes	Check sensor signal wire for incorrect connection or short circuit to ground.

DTC nr	Description	Critical	Non-critical	Passive	Freeze frame	Possible solution
21	Gas temperature signal too high	Yes			Yes	Check sensor signal wire for incorrect connection or short circuit to power supply.
22	Gas temperature signal too low	Yes			Yes	Check sensor signal wire for incorrect connection or short circuit to ground.

AFC-2.0 Fuel selection switch

- New modern design
- Programmable RGB LED's
- 3-wire connections instead of 7
- LIN communication with AFC-2.0 ECU
- Automatic switch software update

- "6" level indication LED's
- Programmable LED colour
- Tank empty LED, default RED
- Programmable tank levels



- Programmable Beeper volume

- Larger selection button
- Programmable logo colour
- System diagnostic LED
- Automatic daylight correction

AFC-2.0 Fuel selection switch

- **Automatic fuel switch software update**
  - automatic update after communication with diagnostic software (diagnostic LED's flashes blue)
- **Programmable tank sensor selection.**
  - Pre-defined:
    - Hall >> 5 indication levels
    - 0-95 Ohm >> 6 indication levels
    - CNG gauge >> 6 indication levels
  - User defined:
    - >> 6 indication levels
- **Automatic daylight correction:**
  - default linear correction.
  - programmable by look up table for optimization of LED illumination.

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Thank you

for your attention