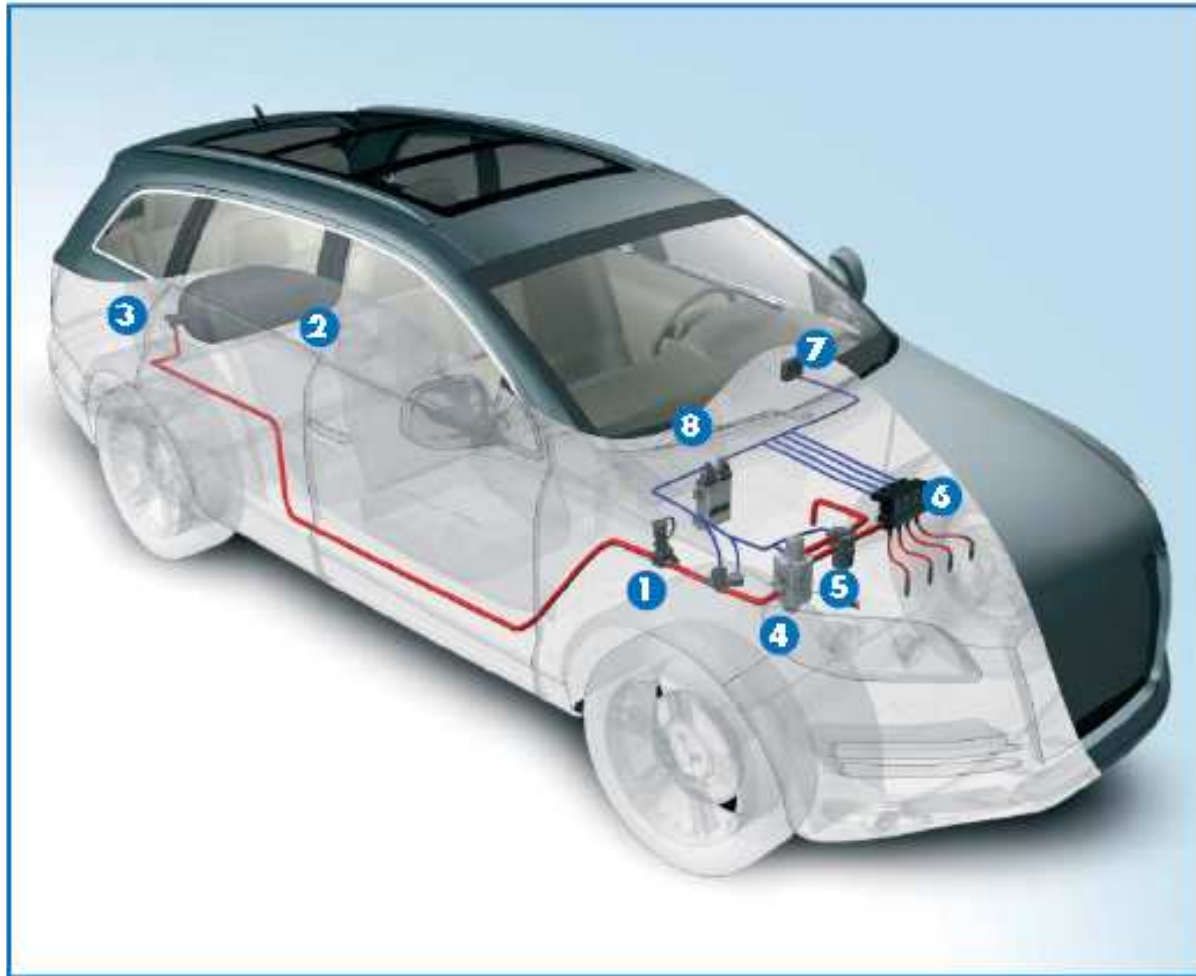


CNG LOVATO Injection System

CNG LOVATO Injection System

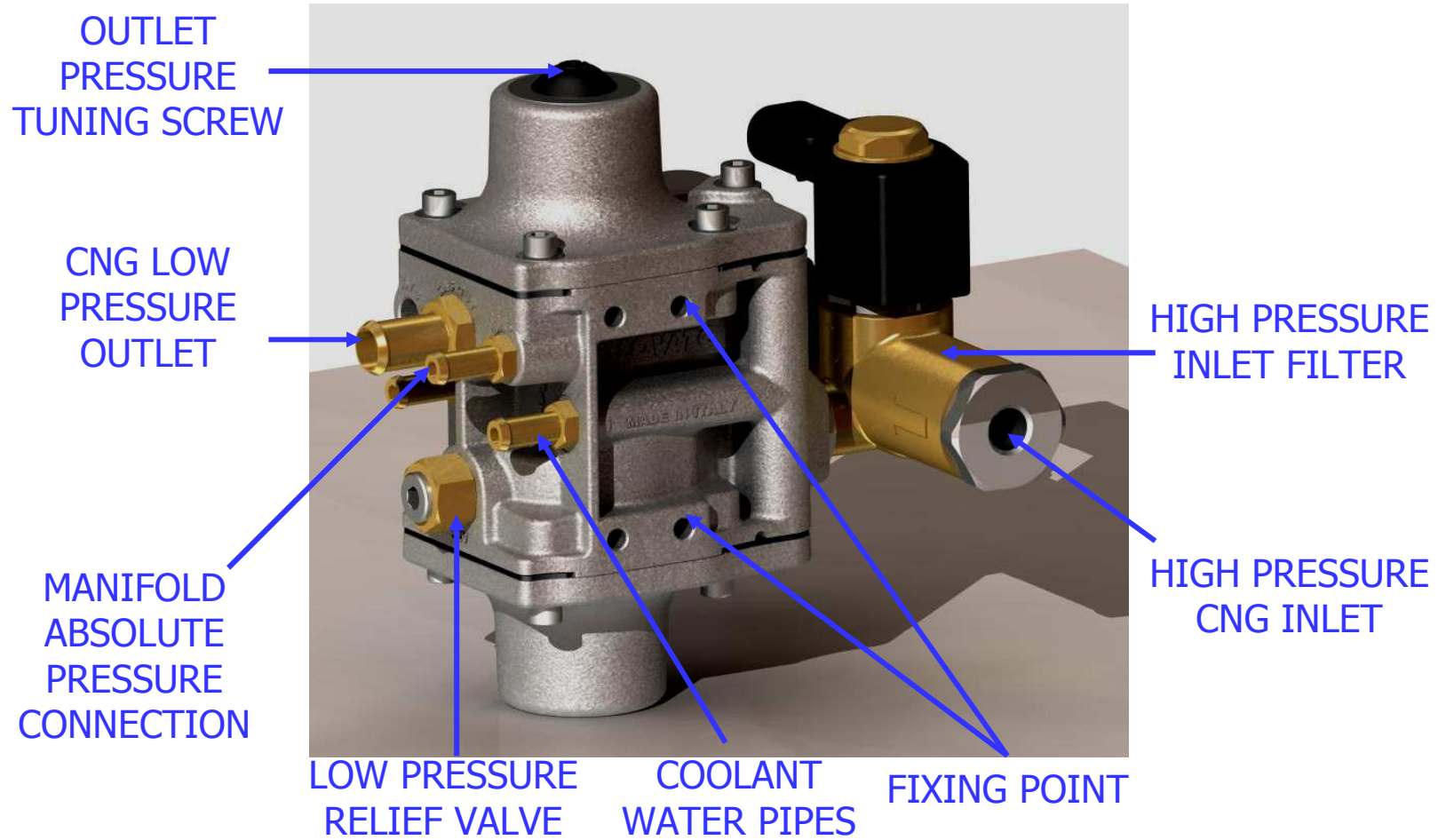


Main components of CNG Injection System



- 1 CNG Filling Valve
- 2 CNG Tank
- 3 CNG Cylinder Valve
- 4 CNG Reducer
- 5 Filter & Sensors
- 6 CNG Injectors
- 7 CNG Switch
- 8 CNG ECU

RMJ: CNG Pressure Reducer

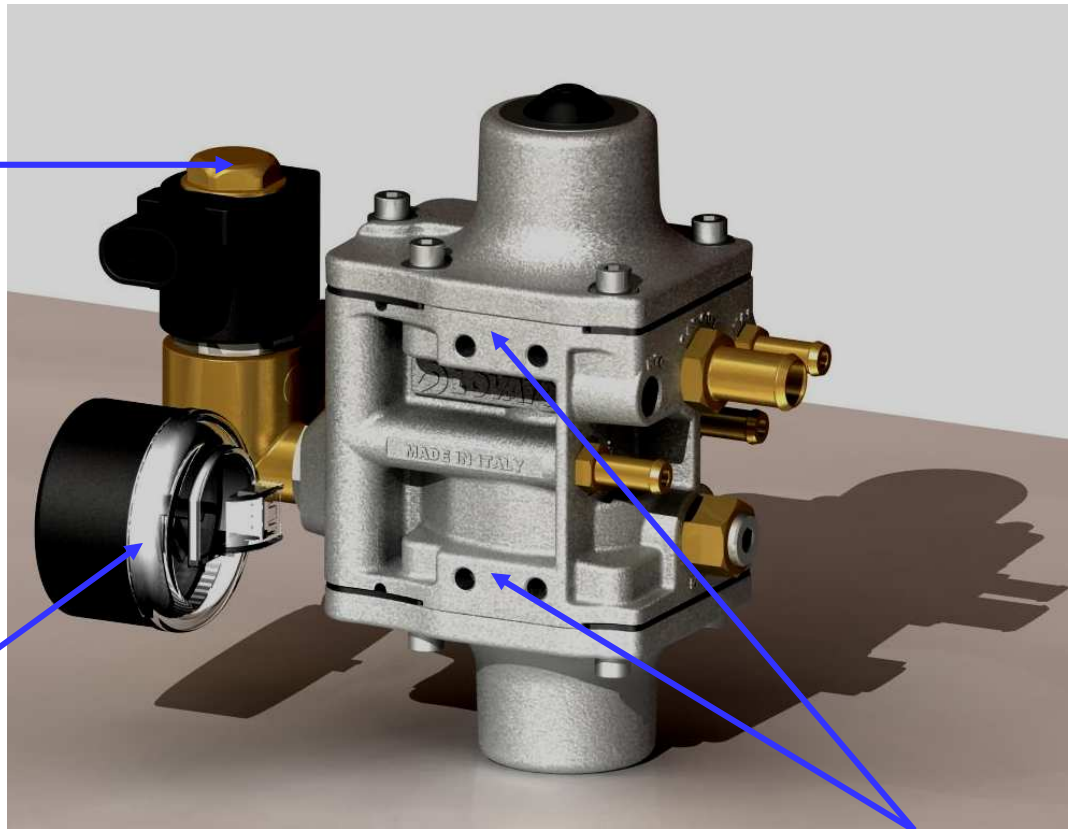


RMJ: CNG Pressure Reducer



HIGH
PRESSURE
SHUT-OFF
VALVE

HIGH PRESSURE
LEVE GAUGE

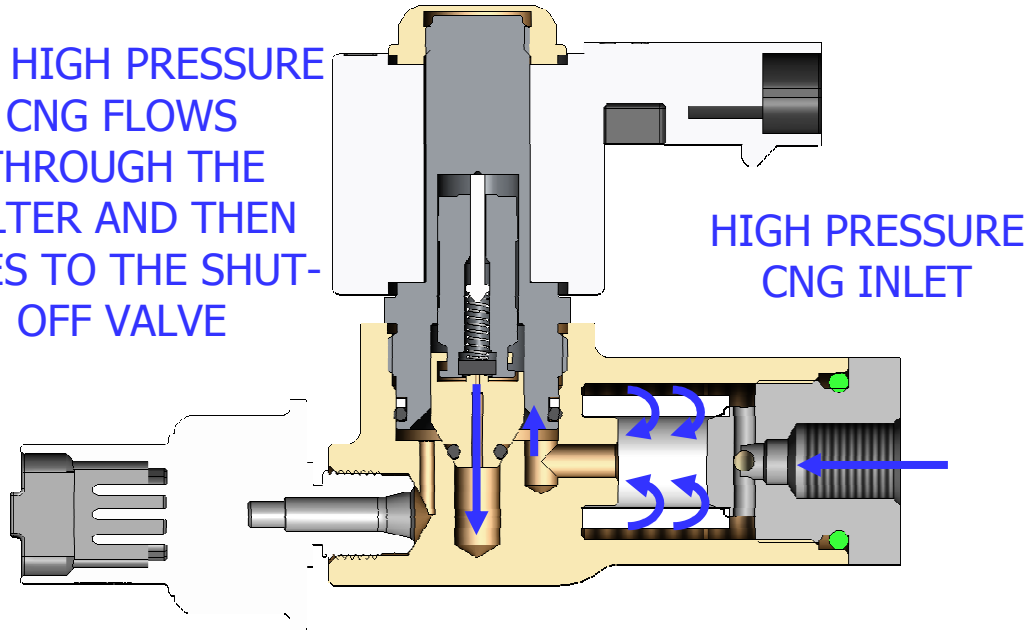


FIXING POINT

RMJ: CNG Pressure Reducer

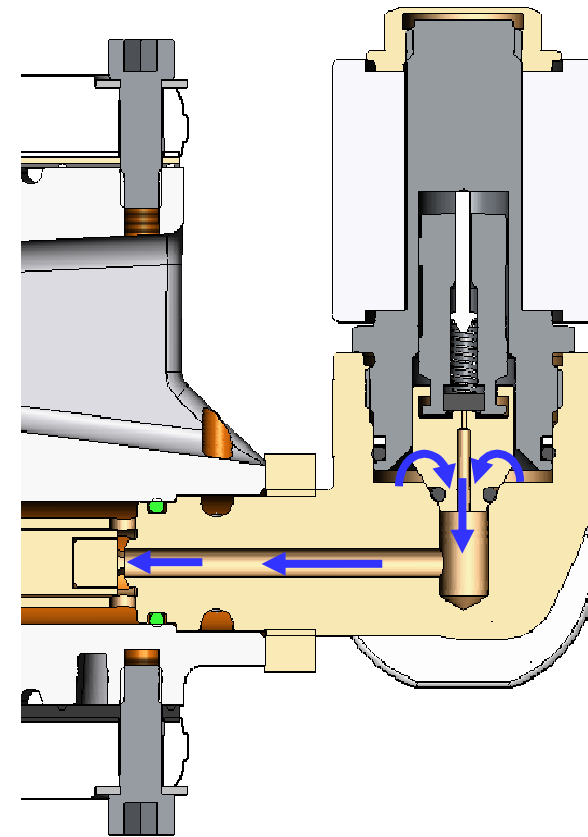


THE HIGH PRESSURE CNG FLOWS THROUGH THE FILTER AND THEN GOES TO THE SHUT-OFF VALVE

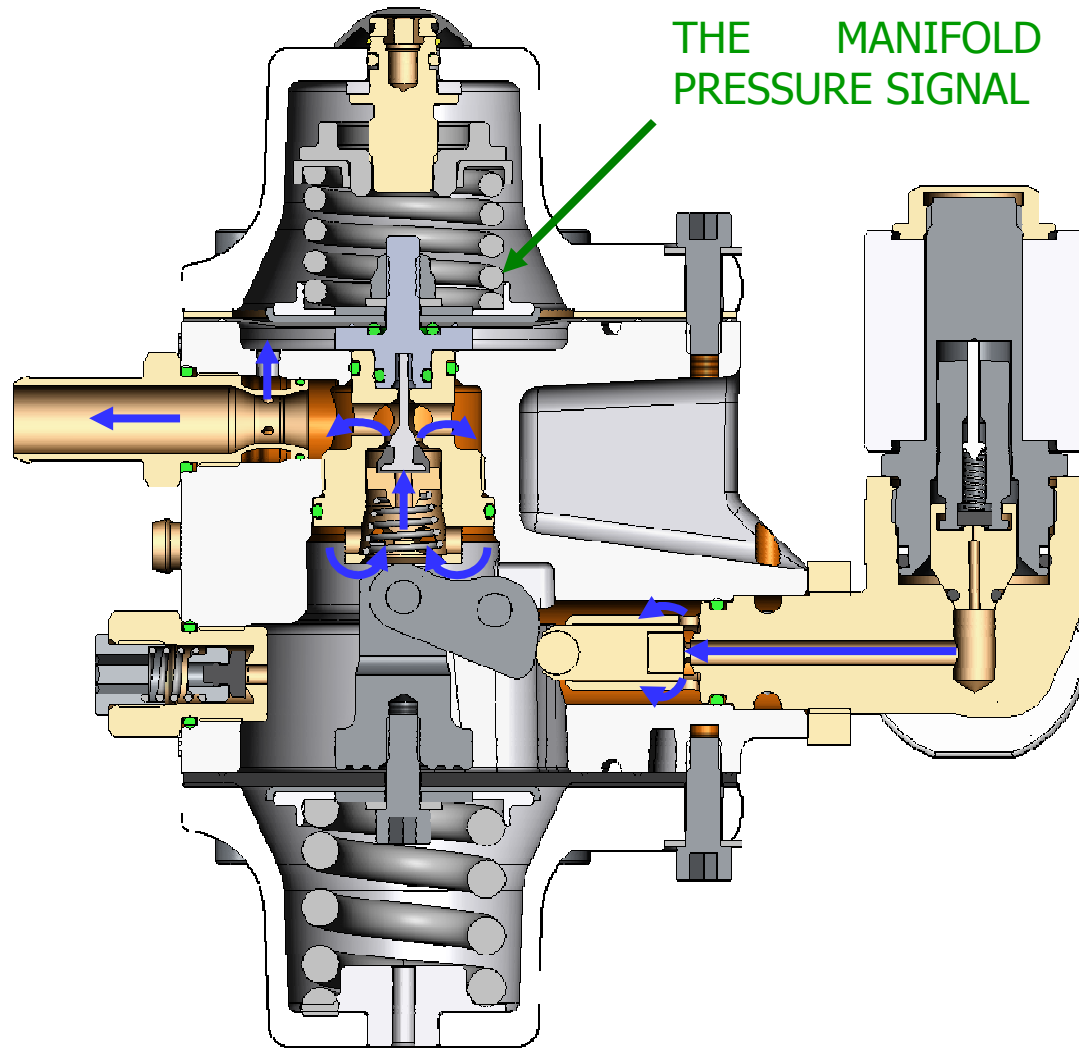


HIGH PRESSURE CNG INLET

IF THE POWER IS OFF THE SHUT-OFF VALVE IS CLOSED AND STOPS THE CNG, WHEN THE POWER IS ON THE SHUT-OFF PLUNGER MOVES TOWARD THE ELECTRO MAGNET AND THE CNG FLOWS TOWARD THE 1° PRESSURE REGULATION STAGE



RMJ: CNG Pressure Reducer



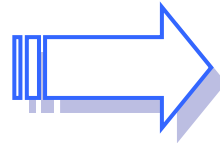
ABSOLUTE

THE CNG FLOWS THROUGH THE TWO PRESSURE REDUCTION STAGES WHERE THE PRESSURE IS REGULATED IN FUNCTION OF THE MANIFOLD ABSOLUTE PRESSURE AND OF THE FLOW RATE. THE CNG FLOWS TOWARD THE INJECTORS THROUGH THE OUTLET PIPE

RMJ: CNG Pressure Reducer Highlights

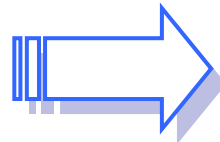


High integrated OEM system



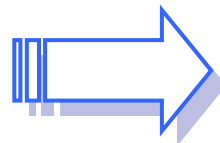
- High pressure valve integrated
- High pressure level gauge integrated
- Inlet body with orientable connection patented

Higher performances



- Little dimensions and low weigh of the reducer
- Easy installation
- Adjustable outlet pressure
- Low outlet pressure variations in all conditions
- Optimized heat exchange with engine coolant water

Validation

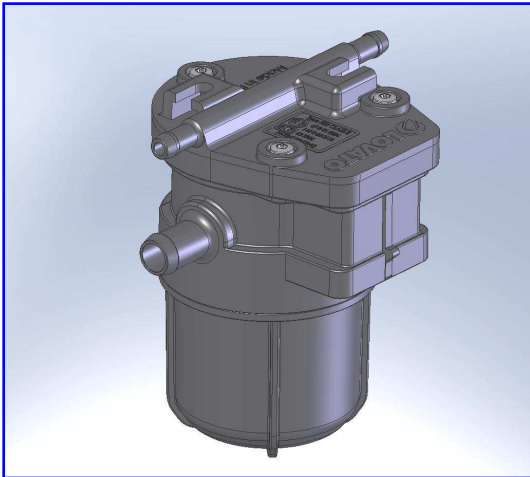


- Hard validation tests
- European and ISO standard compliant

FSU: LPG-CNG Filters



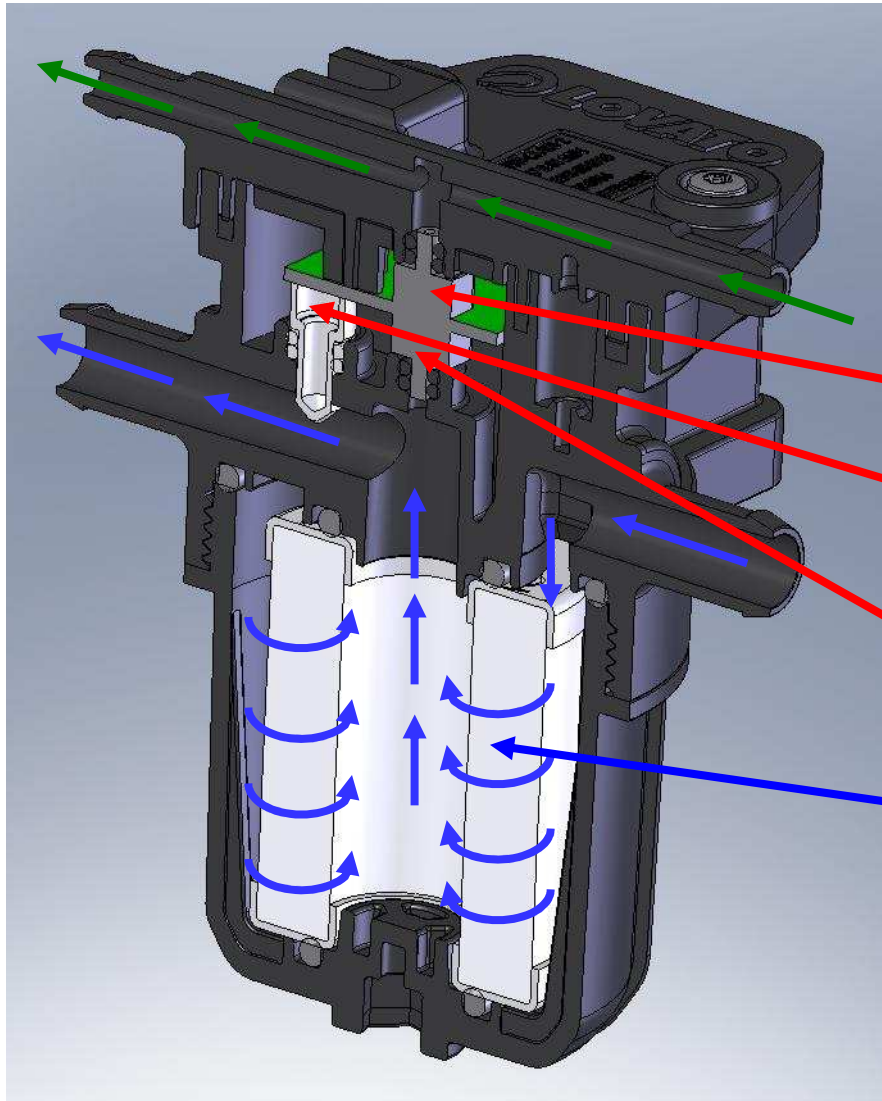
LOW PRESSURE FILTER
WITH INTEGRATED MAP,
GAS TEMPERATURE AND
PRESSURE SENSORS



LOW PRESSURE FILTER



FSU: LPG-CNG Filters



THE MANIFOLD ABSOLUTE PRESSURE SIGNAL

THE MANIFOLD ABSOLUTE PRESSURE SENSOR

THE LPG and CNG TEMPERATURE SENSOR

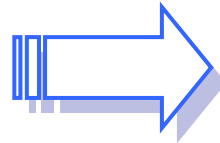
THE LPG and CNG PRESSURE SENSOR

LOW PRESSURE LPG CARTRIDGE

FSU: CNG filter Highlights

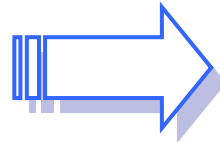


High integrated
OEM system



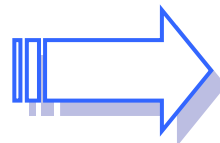
- Injection pressure sensor integrated
- Injection temperature sensor integrated
- Low pressure filter cartridge replaceable

Higher
performances



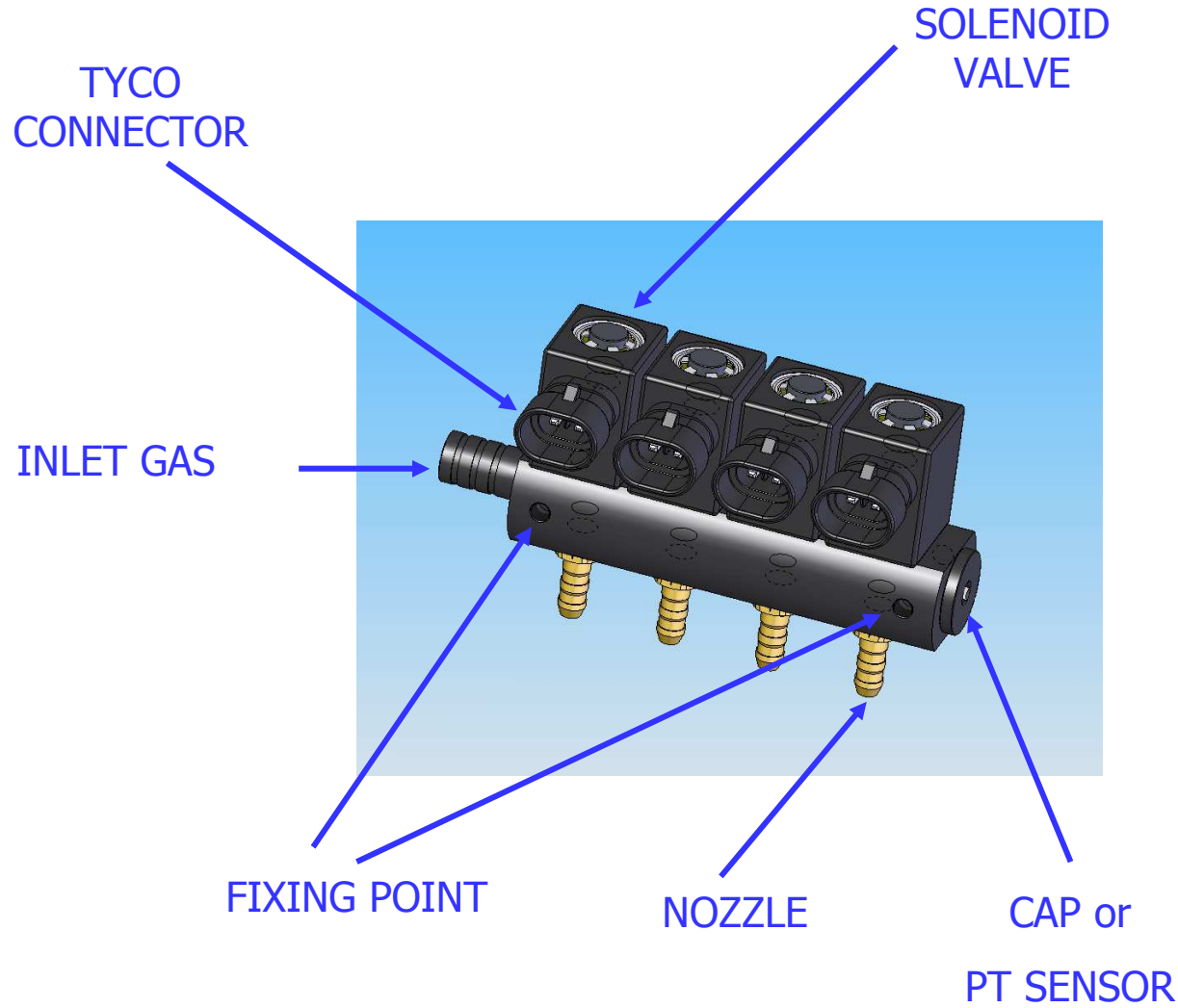
- Low pressure drop at maximum flow rate
- High filtering capacity

Validation



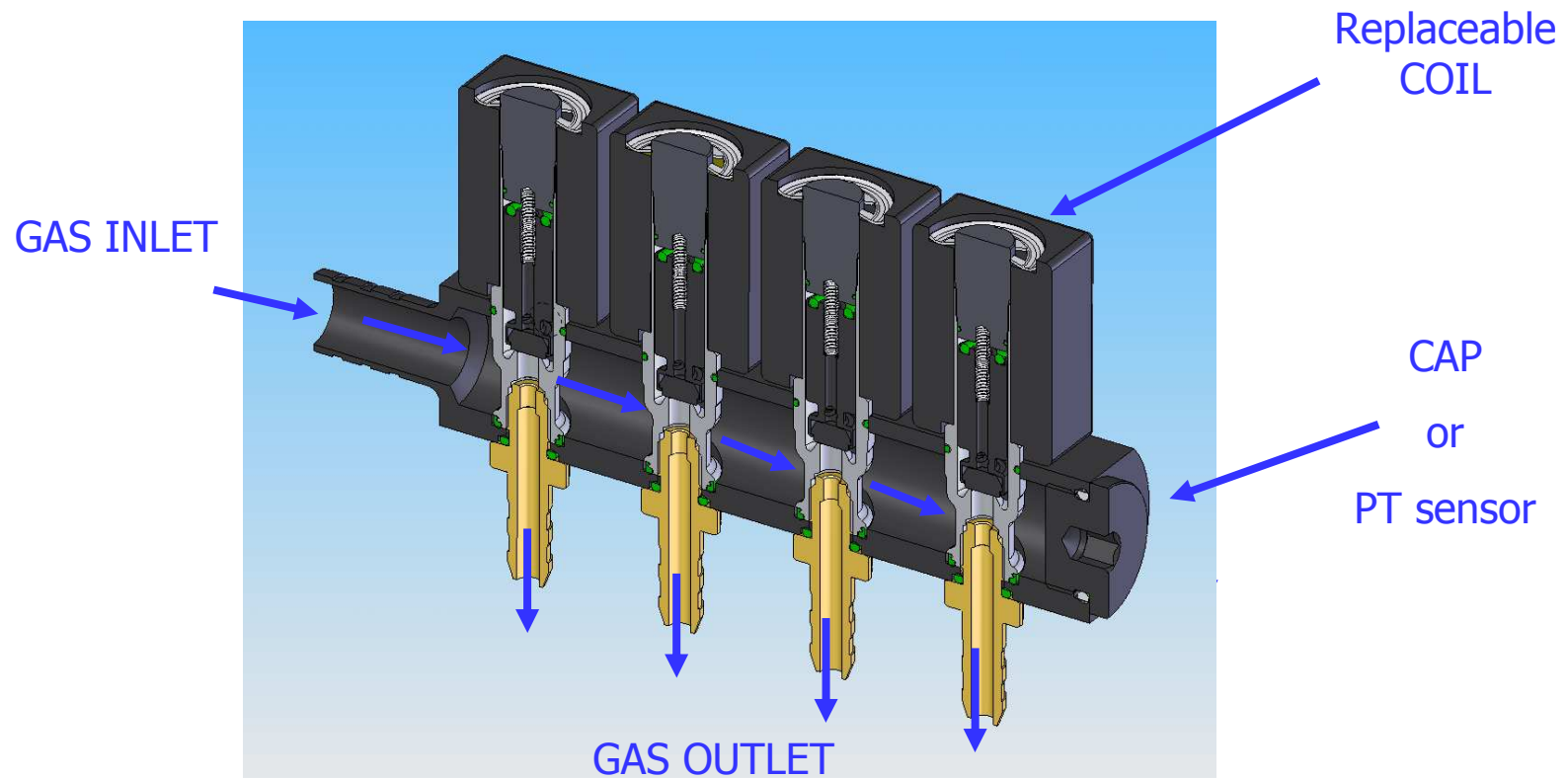
- Hard validation tests
- European standard compliant

JLP: Gas Injectors (LPG/CNG)



November 2008

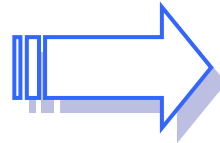
JLP: Gas Injectors (LPG/CNG)



JLP: CNG injector Highlights

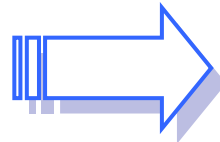


High integrated
OEM system



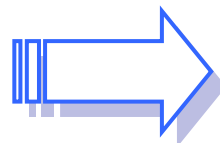
- Modular composition for easy fitment for every type of engine
- Nozzle size customized on the engine application

Higher
performances



- High flow rate capacity
- Low sensitivity to gas quality (oil and other impurities)
- Low current consumption
- High reliability (100 % on line tested)

Validation

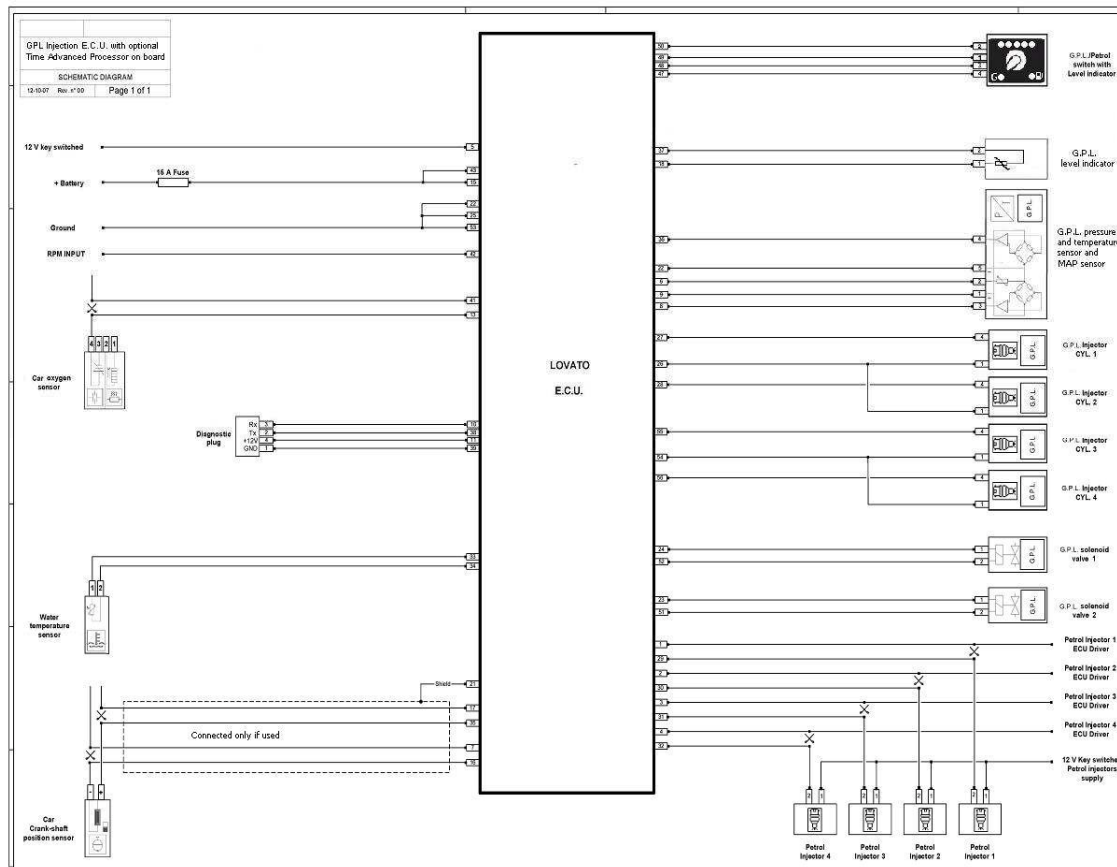


- Hard validation tests
- European and ISO standard compliant

ECU : Gas management system



Synoptic

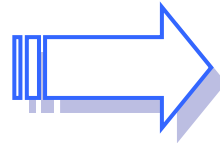


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ECU: CNG Electronic Unit Highlights

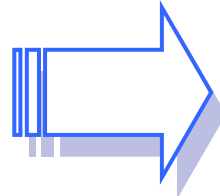


High integrated
OEM system



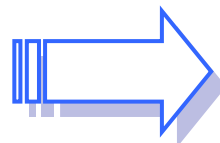
- no sensors duplication (MAP, water sensor)
- on GAS mode spark advance management integrated in the GAS ECU

Higher
performances



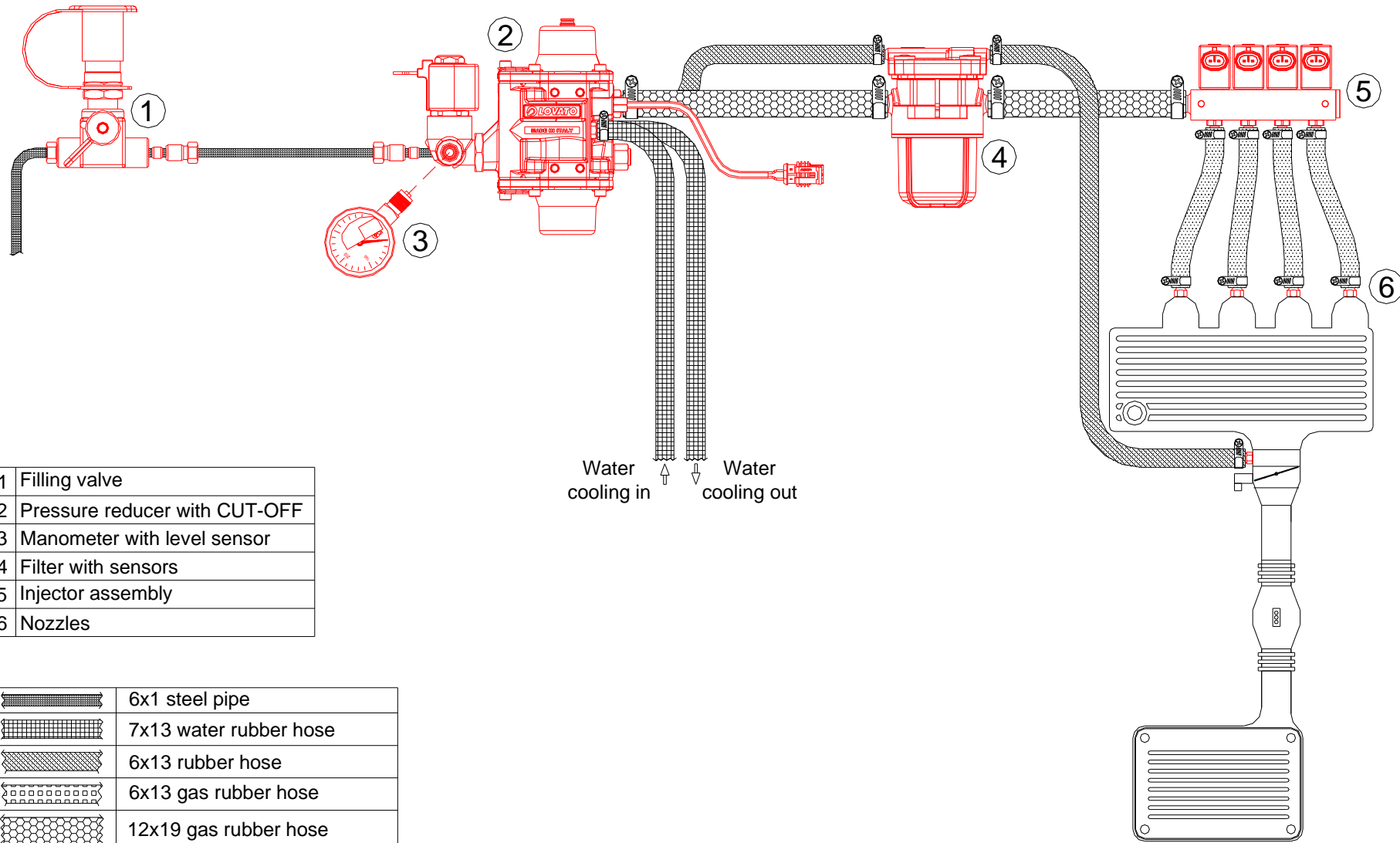
- Euro 4 STD emission level compliance
- Several strategies in specific engine condition
- Not intrusive system on petrol system diagnosis
- Dedicated configuration to get emission, drivability and performance target
- Diagnostics system on gas equipment components

Validation



- Hard validation tests
- European and ISO standard compliance

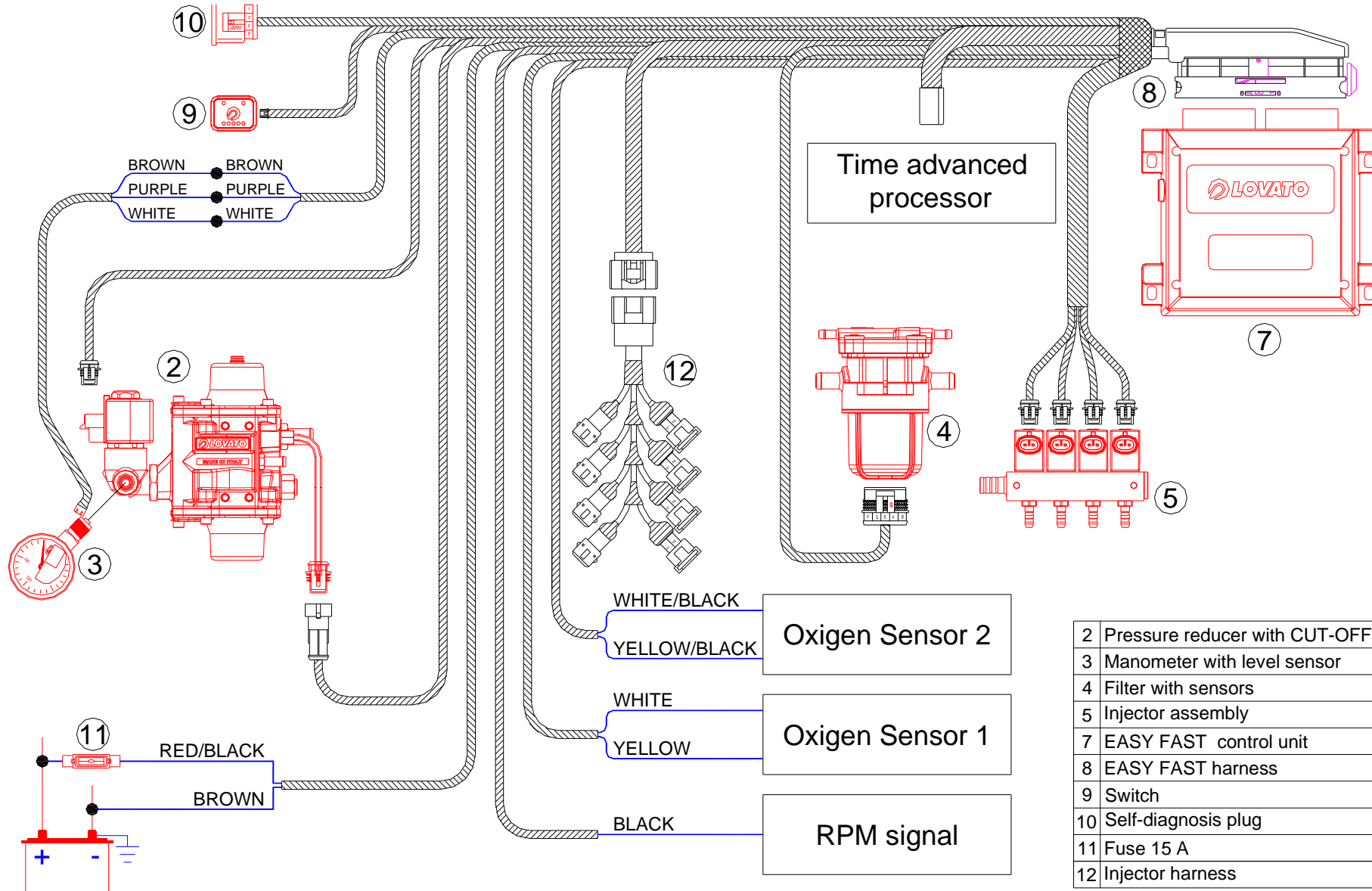
CNG Pneumatic Lay-out



| | |
|---|-------------------------------|
| 1 | Filling valve |
| 2 | Pressure reducer with CUT-OFF |
| 3 | Manometer with level sensor |
| 4 | Filter with sensors |
| 5 | Injector assembly |
| 6 | Nozzles |

| | |
|--|------------------------|
| | 6x1 steel pipe |
| | 7x13 water rubber hose |
| | 6x13 rubber hose |
| | 6x13 gas rubber hose |
| | 12x19 gas rubber hose |

CNG Electrical Lay-out



| | |
|----|-------------------------------|
| 2 | Pressure reducer with CUT-OFF |
| 3 | Manometer with level sensor |
| 4 | Filter with sensors |
| 5 | Injector assembly |
| 7 | EASY FAST control unit |
| 8 | EASY FAST harness |
| 9 | Switch |
| 10 | Self-diagnosis plug |
| 11 | Fuse 15 A |
| 12 | Injector harness |