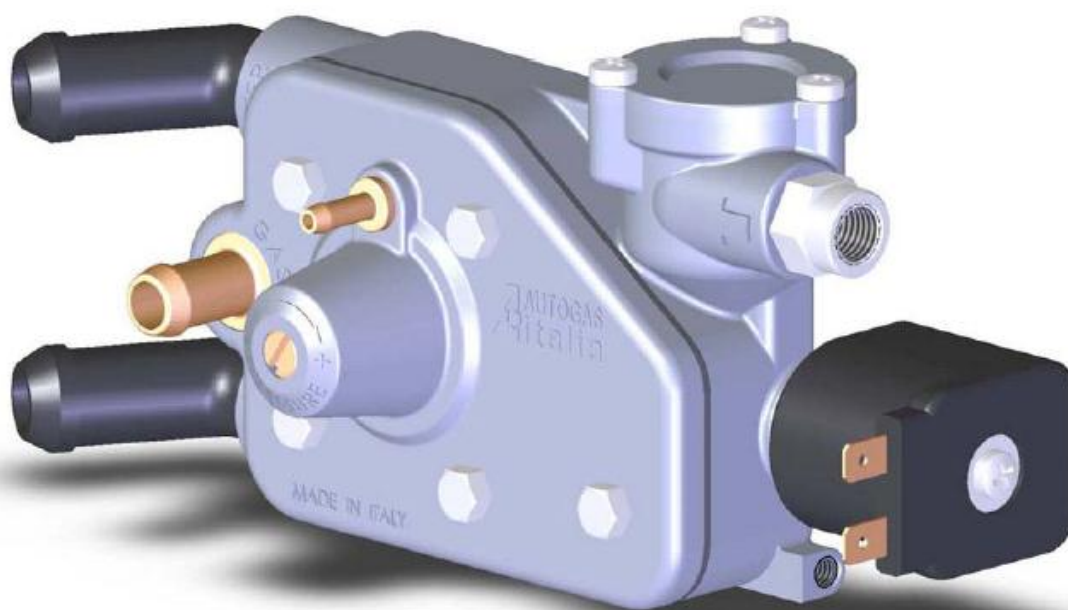


POWERJET PJ+ SYSTEM

Installation manual



Index

1	SYSTEM	5
	Operating principle	5
2	PROCESSED SIGNALS	6
2.1	Input signals	6
2.1.1	Fuel injection	6
2.1.2	RPM (rev)	6
2.1.3	MAP (collector aspiration pressure)	6
2.1.4	Coolant temperature	6
2.1.5	Gas temperature	7
2.1.6	Gas pressure	7
2.1.7	Fuel level (gas)	7
2.2	Output	7
2.2.1	Gas injection	7
2.2.2	Gas solenoid valves	7
2.2.3	Switch	7
2.2.4	IT / computing diagnosis	7
3	COMPONENTS	8
3.1	RPN09 pressure reducer	8
3.2	Water temperature sensor	10
3.3	Low pressure filter	10
3.4	Rail injectors	11
3.5	Nozzle manifolds	12
3.6	PJ + ECU	13
3.7	Switch	14
3.8	Wirings	15
3.8.1	PJ+ ECU 1 connector 4 cyl. wiring	15
3.8.2	PJ+ ECU 2 connectors 6 cyl. wiring	16
3.8.3	PJ+ ECU 2 connectors 8 cyl. wiring	17
3.8.4	Fuel injectors excluded wiring	18

4	INSTALLATION	18
4.1	Equipment / tools needed	18
4.2	Mechanic materials	19
4.3	Installer technical expertise level	19
4.4	Before beginning the intallation	19
4.5	Components installation	20
4.5.1	Gas managements components infos	20
4.5.2	Clamps opening / closing	20
4.5.3	RPG09 pressure / vaporization reducer	20
4.6	Low pressure filter	22
4.7	Rail injectors	22
4.8	Nozzle manifolds	23
4.9	Connection pipes	24
4.10	PJ + ECU	24
4.11	Map	24
4.12	Switch	22
4.13	Electrical connections	25
4.14	System maintenance	25
4.15	First refueling	25
4.16	Pre, during and post installation controls	26
5	SETBACKS/CAUSES/SOLUTIONS	27
5.1	Installation	27
5.2	Idle speed engine functioning	27
5.3	Idle speed engine exit with a slow acceleration	28
5.4	Idle speed engine exit with a strong acceleration	28
5.5	Gasoline/gas pass	29
5.6	Idle speed return	30
5.7	Operation in power	31
5.8	Mid / high RPM accelleration	31
5.9	Errors / Diagnosis	32

	5.10	Various problems	33
6	REAR INSTALLATION		34
	6. 1	Tanks	34
	6.2	Cylindrical tanks	34
	6.3	Cylindrical multivalves installation	35
	6.4	Toroidal tank installation	39
	6.5	Multivalve hi - pressure pipes	46
	6.6	Level sensor	50
	6.7	Tank filling system	51
	6.8	Multivalve Troubleshooting	54
7.	ELECTRIC WIRING		60

1.1 OPERATING PRINCIPLE

PJ+ is one of the most modern and evolute gasoline-to-LPG converting systems in gaseous phase, now existing on the market. The principle by which PJ+ generates injection times for gas injectors is based on gasoline injection times acquisition (during gas operating); this thanks to the automatic emulation of gasoline injectors functioning. As a consequence the engine management is left to the gasoline ECU. On the other hand, the gas ECU have to convert the commands to the gasoline injectors (generated by gasoline ECU) with suitable instructions for the gas injectors. In this way the gasoline ECU parametric feature is not altered, so it will not distance itself during the gas usage. In this way the system won't be invasive to the gasoline one, actually he can efficiently assimilate itself with main functions like: carburetion control, EGR, Canister, Cut Off, OBD corrector etc.

Gasoline to gas injection times gesture/conversion is possible with the elaboration of others parameters:

- rail injectors gas pressure
- gas temperature
- cooling engine water temperature inside the reducer
- RPM
- battery tension
- Vehicle OBD original correctors

PJ+ system is a sequential phased one . PJ+ ECU provoke the gas injector opening, on the same cylinder on which gasoline injection would happen if the vehicle worked with that fuel. This strategy maintains the two gasoline / gas systems linked during their functioning.

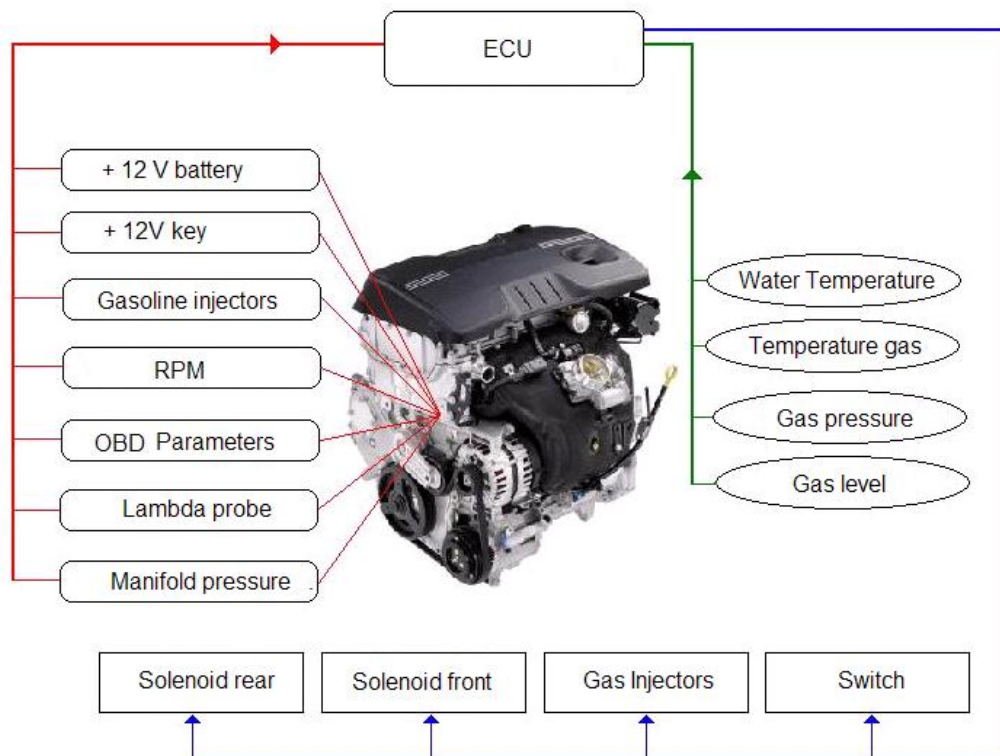
The automatic gas commutation engine starting reaches its preset parameters by software. This is possible if the switch is placed on gas position. If the switch is on gasoline position, the vehicle will constantly travel petrol. The direct gas starting function has to be considered only in case of EMERGENCY.

The liquid gas arrives from the tank to be vaporized and resized inside the reducer with an exit pressure of about 1 bar bigger then the one inside the aspiration collector. When PJ+ system goes from fuel to gas, the gasoline injectors are disconnected (at the same time an emulating injectors signal is sent to the ECU fuel so that they're still considered operating) and the PJ+ ECU will begin to control the gas injectors

The PJ+ ECU reads the fuel injection time of each single cylinder and it tune it up to determine an adequate opening time for the gas injector, always relating to that specific cylinder. The fast and precise PJ+ calculating system allows the operator to automatically creates (following PJ+ software instructions) a precise collaboration, with the creation of an easy understandable "items map" . If you want to over improve PJ+ reliability it's possible to analyse OBD system signals (of the vehicle). In this way you can activate a parallel gas system.

ECU PJ+ not only manages the signals we previously saw, but also all the additional functions like: fuel level indication, electrovalves opening/closing, automatic fuel backpass in case of LPG exhaustion or low gas pressure etc. ECU PJ+ can also manage many others additional functions through software which permit it to be installed on all the most recent vehicles (electronic engines vehicles included).

2 PROCESSED SIGNALS



2.1 INPUT SIGNALS

2.1.1 Fuel Injection

First of all ECU PJ+ uses fuel injection times to generate the amount of gas to inject in the cylinder: ECU PJ+ processes fuel injection times and switches them into gas injection times thanks to the opening / closing of the gas injectors.

2.1.2 RPM

RPM are a base parameter to switch fuel injection time in a gas injection one. RPM signal send an information to the ECU PJ+ if the engine is working or if it's sleeping. ECU PJ+ manages two RPM signal taking methods. The first one needs an electrical connection to a signal source (rev counter or ignition coil). The second one determines in automatic mode, the number of RPM from the reading of the injection timing generated by the petrol ECU. It's possible to select the selected method through the software system.

2.1.3 MAP

The MAP signal is used to manage the fuel back pass in case of LPG running out. It's generated from the MAP detector inside PJ+ system.

2.1.4 Coolant temperature (inside the reducer)

The engine coolant temperature is used to:

- manage the fuel / gas switch;
- correct the gas injection times according to the different coolant ranges

2.1.5 Gas temperature (optional)

Gas temperature is used to correct the gas injection time. The correction compensates for the variation in intensity of the gas at its various temperatures. This process is an optional one because we already implement a water temperature compensation on the reducer which perfectly fits to RPN09 features.

2.1.6 Gas pressure

Gas density and volumetric energy increase along with its pressure. A gas injection time pressure correction is essential to compensate this growth. The gas pressure signal is used for a fuel backpass in case of LPG empty tank, gas filter obstruction or all the cases regarding pressure drop. The software permits the activation (optional) of a compensation table for the pressure. If enabled this function will modify the gas injector opening times according to the value of pressure expressed in bar.

2.1.7 Fuel level (gas)

The gas level is installed on the multivalve and it sends to the ECU PJ+ the signal on the amount of gas inside the tank. The ECU PJ + converts the signal into a visual indication implementing power on / off LED on the switch. The values can be modified by software.

2.2 OUTPUTS

2.2. Gas injection

Starting from the petrol injection times the ECU PJ + calculates the gas injectors (taking into account the functions seen above) to ensure proper operation of the vehicle while traveling on gas.

2.2.2 Gas solenoid valve (integrated in the reducer)

ECU PJ + controls system solenoid valves opening / closing; normally it happens on multivalves and on RPG09 reducer.

2.2.3 Switch

The switch is used to switch to gas or gasoline, and highlights:

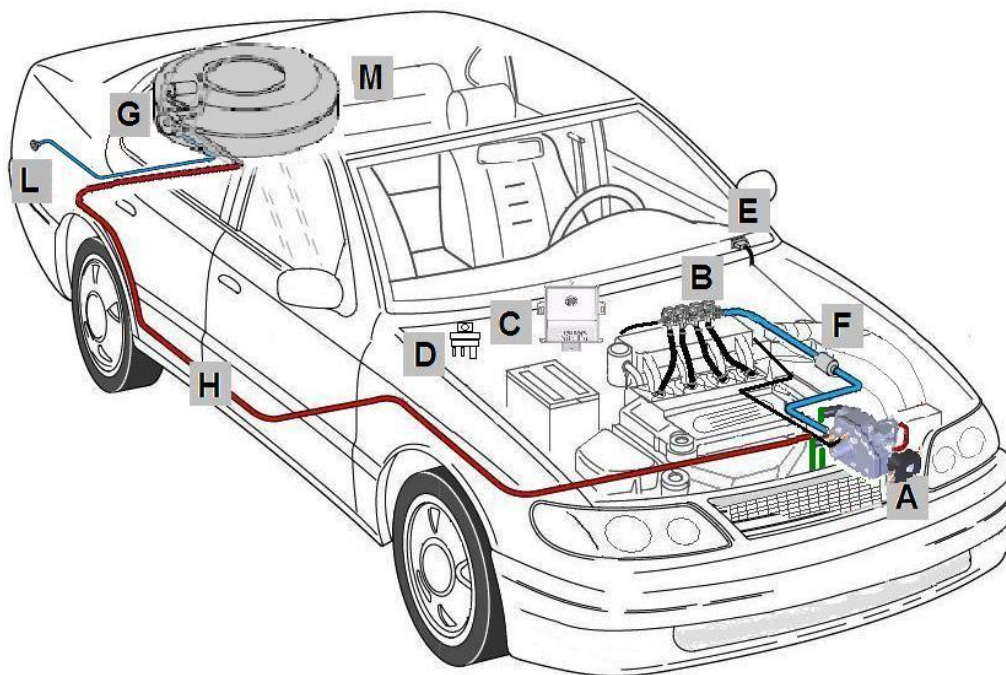
- The type of fuel in use
- The amount of LPG in the tank (fuel level 2.1.7)
- Diagnostic signals and possible warning signal.

2.2.4 IT / Computing diagnosis

The PC is used to:

- Program the ECU PJ+
- Diagnose malfunctions in the system
- Monitor the system

3. COMPONENTS



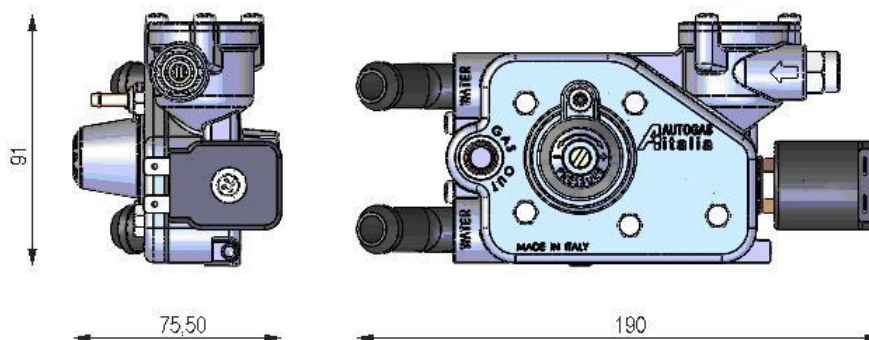
- A Pressure reducer (3.1)
- B Rail injectors (3.4)
- C Control carburation Electronic Box. ECU. (3.6)
- D MAP and gas pressure detector
- E Switch
- F Low pressure filter (optional)
- G Multivalve tank
- H Hi - pressure piping
- L Refueller socket
- M Tank

3.1 RPN09 PRESSURE / VAPORIZATION REDUCER

RPG09 reducer is a single stage membrane one (with intake manifold pressure) and it works as a water-gas heat exchanger. It's calibrated for a supply pressure of:

- 1 bar (100 kPa) for the 110 kw version
- 1.2 bar (120kPa) for the 140 kw version

This measure is superior then the pressure inside the intake ducts of the aspirated vehicles. The solenoid valve can have different types of connection according to the requested features.



Characteristics:

Fuel

Nominal operating flow

Operating temperature

Working pressure

Electrical characteristics solenoid coil

Gas outlet pipe

Hot water pipe

Intake manifold vacuum hose

High pressure hose inlet gas

Blocking high pressure hose fitting

LPG

33 Kg/h

-20 ÷ 120 °C

da 1 bar (100 kPa) a 1.3 bar (130 kPa)

12V 11W

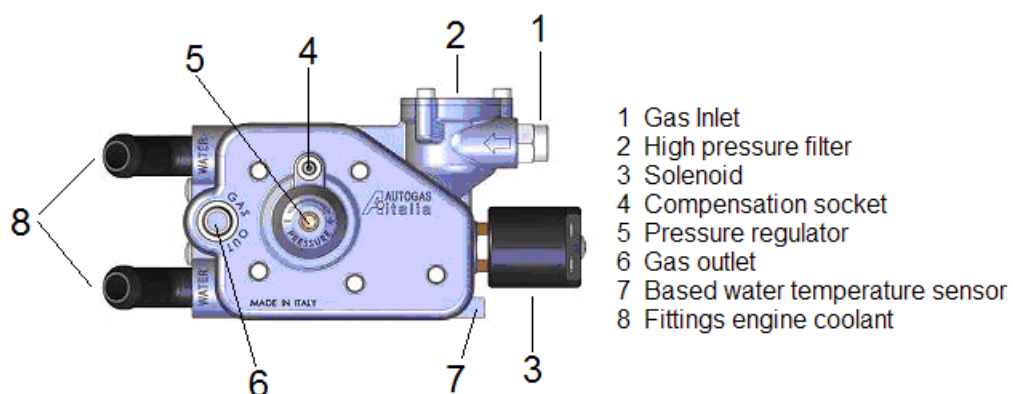
10 mm inner diameter

16 mm inner diameter

5 mm inner diameter

6 mm inner diameter

M10x1



RPG 09 reducers are individually calibrated and tested, ready to be installed without being controlled again during the setting up. One fundamental part of the reducer is the first reduction rubber membrane. During the setting up the membrane has of course, a harder texture. This because it's new and it has never worked before. After some hundreds of miles covered, its physical features change a bit. For this reason the reducer working pressure could vary a bit. In this case it's suggested to control it (and to calibrate it, if necessary) after a small working time (abt 2000 km). This operation is possible by connecting a PC (with the software installed, as seen on SET UP) to the ECU PJ+. For a good regulation please consider the following aspects: gas working vehicle, correct working temperature, engine idling.

To regulate the pressure, please adjust the screw (5) at the center of the frontal RPN 09 reducer cover. By screwing (clockwise) we increase the pressure, by unscrewing (counter clock) we decrease the pressure. Never exceed a number of 5 full turns screwing or unscrewing. A security lock is insert inside the reducer in order to "protect" the unscrewing. If despite the manual intervention the pressure value does not fix to the correct values, check the other components of the system such as: connection vacuum hose to the reducer (4), possible aspirations, low pressure filter (2), injectors, rubber pipes.

Programmed maintenance

Follow the instruction on the user guide and maintenance.

3.2 WATER TEMPERATURE SENSOR

The water temperature sensor is placed in the lower part of the pressure reducer (7) and it's screwed on the RPG 09 reducer during the installation phase. For electrical connection wiring look at the following diagrams.

Technical specs:

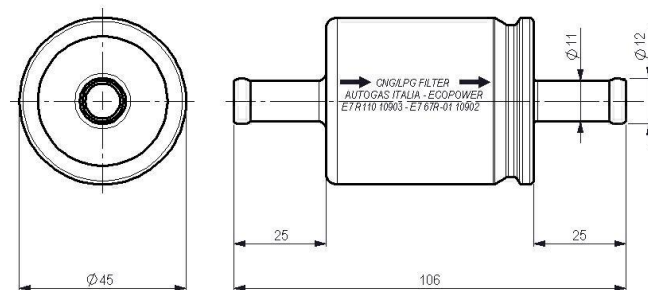
Type of sensor 10 K Ω

3.3 LOW PRESSURE FILTER (optional)

The filter (supplied upon demand), has the function to filter out any impurities present in the gas (low pressure) during the gas phase. The input of the filter is connected to the pressure reducer through a rubber hose of a 10 mm internal diameter. The filter output is connected to the inlet of the rail injector reducer through a rubber hose of a 10 mm internal diameter. On the outer case of the filter is located an arrow that indicates the direction in which the gas must flow.

Technical specs:

Filtration range	10 micron
Maximum working pressure	4.5 bar
Filter body	throwaway
LPG ratification	Class. 2°

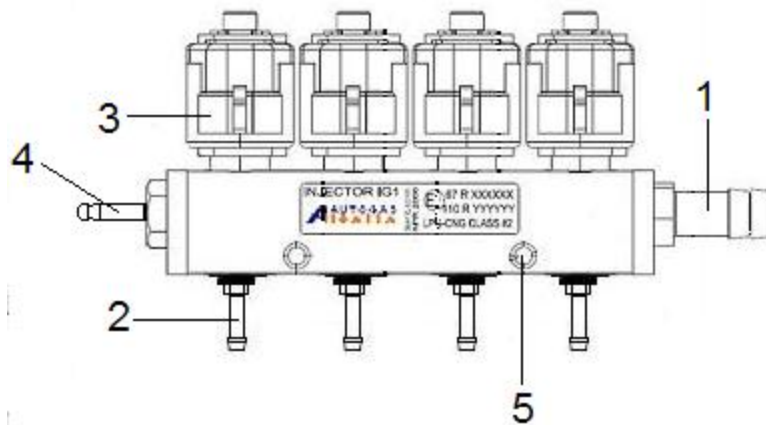


3.4 RAIL INJECTORS

The LPG, coming from the filter enters from the inlet connector 1 and fuel the injectors. The gas engine comes out of the injectors through nozzles 2, it reaches (through rubber hoses) the intake manifold and then the cylinders. The injectors are controlled by ECU PJ + through electrical connection (connectors 3). The gas pressure in the rail is taken through connection 4.

A rubber hose attaches connection 4 to the pressure sensor MAP PJ + on the input marked with PRESS. The rail injector is fixed to the mounting bracket with resilient mounts screwed into holes 5.

The gas temperature sensor (optional, available on request) is composed by: two electric wires coming out of the hexagon of the input connector 1. One must be connected to the ECU PJ+ (signal) wiring pink/black wire, the other to the black wire (ground) coming out of the case of the pink/black one.



Technical specs:

Fuel	CNG / LPG
Injector at rest	normally closed
Fuel supply system	laterally
Working pressure	da 0,5 bar a 4.5 bar
Coil resistance	2 ohm / 3 ohm $\pm$ 4%
Closing time	2,7 ms
Opening time	3,3 ms

Injectors per rail:	2/3/4
Response time:	1.7 ms $\pm$ 0.2
Working:	-40 + 120° C (R110)
Absorbed power:	1 W mantaining
Drive mode:	Peak and Hold

RAIL NOZZLES

A nozzle with a calibrated hole for each individual rail injector. The hole diameter of the calibration is shown on the nozzle outer hexagon. Higher numbers = highflow rates and vice versa. For a first choice, please follow the instructions of the following table. During the self-regulation phase (see SET UP guide), you can find an intuitive graphical indicator that indicates whether the size of the nozzle is correct or not.

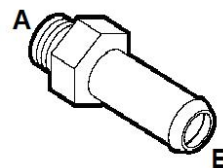


3.5 NOZZLE MANIFOLDS

The nozzle (aspiration collector) is screwed on the aspiration collector from side A, and it's connected by a rubber hose (6mm inner diameter) to the rail injectors from side B.

Technical specs:

Calibrated hole:	4 mm
Rail connection:	external 6 mm
Hole collector:	plastic 4.75 mm / metal 5 mm
Thread:	M6 x 1
Locking:	Hex wrench 3.5 mm

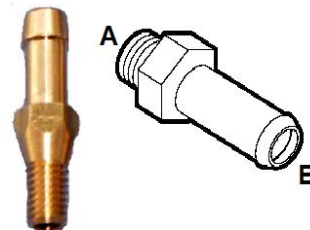


PRESSURE MANIFOLD CONNECTION

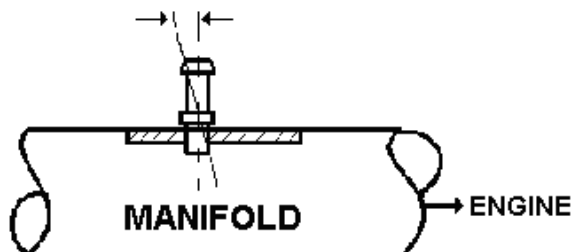
It must be placed.

Technical specs:

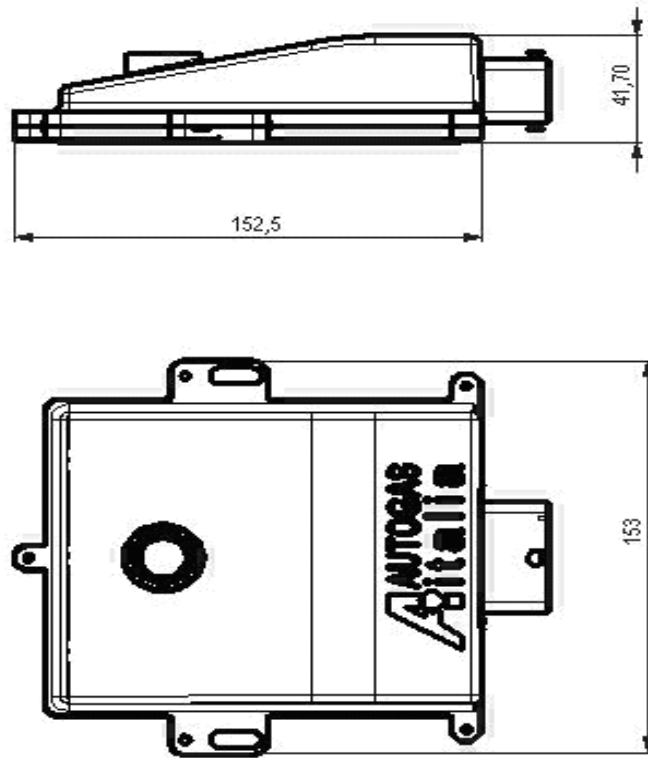
Calibrated hole:	3 mm
Inner diameter pipes:	5 mm
Hole collector:	plastic 4.75 mm / metal 5 mm
Thread:	M6 x 1
Locking:	Hex wrench 7 mm



Please pay attention while drilling the aspiration collector. The insert must be perpendicular to the collector, or it must face the engine. In any case, it **MUST NEVER FACE THE ASPIRATION FILTER**. Never force plastic collectors excessively as the nozzle conical part could excessively dilate the plastic hole. In this case its good functioning (possible air aspiration) could be compromised.



3.6 ECU PJ+



Gas system management is done by ECU (Electronic Control Unit) PJ+.

ECU PJ+ main functions:

Gasoline system management of input signals:

- Fuel injectors opening times reading
- Water engine cooling system reading temperature
- Motor speed (RPM)
- Battery voltage (Volt)
- Intake manifold pressure reading
- OBD system correctors reading (of the vehicle) and others useful parameters
- Reading oxygen sensor with connection via OBD socket

Input signals managed by gas system PJ+:

- Gas pressure
- Water engine cooling system reading temperature
- Gas temperature
- Fuel level sensor (gas)

PJ+ system global management

- Switch
- Solenoid valves opening/closing
- Gas injectors opening/closing
- Fuel injectors disabling and emulation
- Serial communication (ECU gas / PC connection)
- Fuel level indication
- Buzzer switching
- Gas system components control and diagnostics
- PC software communication.

Some of the software parameters can be modified in case of need. In case of new software version or software update the information is automatically sent to the IT when the ECU gas is connected to the PC.

ECU PJ+ specs:

Electric supply:

8 ÷ 16 V

Functioning temperature:

-40 ÷ +120 °C

Processor speed (PLL):

40 Mhz

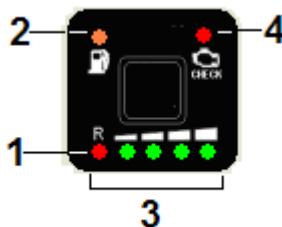
Injectors driver :

up to 8

Solenoid valves outputs:

2

3.7 SWITCH



PJ+ switch allows both gas to petrol and petrol to gas switching. It produces several LED indicators and an acoustic warning signal, which indicates the effective fuel exhaustion and/or possible anomalies of the gas supply system with different pitches. It is important to remember that the ignition is always gasoline, excluding the possible emergency starting if selected (see manual setup) .

Switching button at the center of the switch:

- fuel indication through two lighting LEDs (2) and (3);
- if pressed for about 5 seconds (with under lock and key on), it allows the gas ignition in case of emergency.

Things to do in case of emergency: 1. Ignition key off 2. Press switch button 3. Keep the button pressed and insert ignition key (ignition lights on the dash) 4. Start the engine with switch button pressed 5. Keep the engine on idle speed for some minutes without accelerate or move the vehicle. The gas must warm up in order to avoid possible flooding for too much fuel.

- 1 Set of green/red LEDs (the red LED lights up only by reaching the reserve level)
 - constantly turned on: gas functioning;
 - Rapid flashing: switching parameters reached, waiting for automatic gas switching.
 - Slow flashing: waiting to reach the set parameters for automatic gas switching.
 - if turned on together with the yellow LED: it indicates a back pass to gasoline (also indicated with an acoustic tune). In this particular case the gas level indicator LEDs flash in sequence too.
- 2 Yellow LED
 - constantly on: it indicates gasoline functioning.
- 3 LED set
 - they indicate the gas level (divided into quarters) inside the tank; the red LED (in this sequence) indicates the gas reserve inside the tank.
- 4 Red LED: indicates a fault stored in diagnosis.

PJ+ system is equipped with a self-diagnosis system that indicates any bad-function or anomalies in the gas components (with LED number 5).

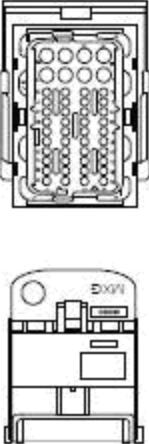
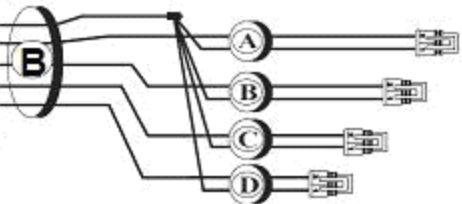
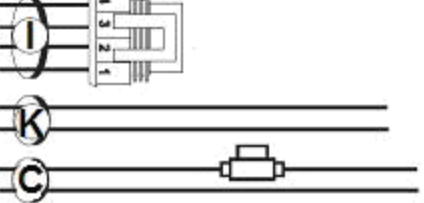
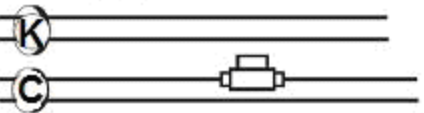
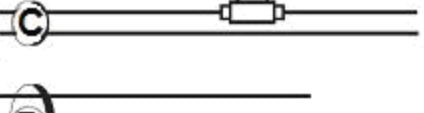
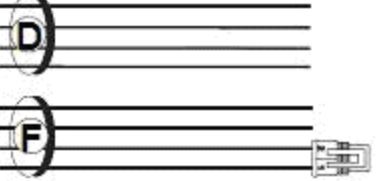
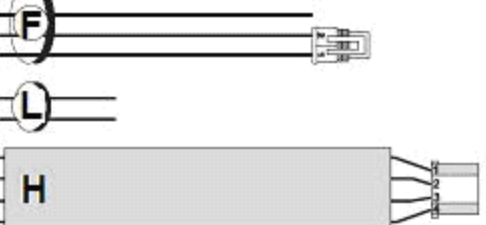
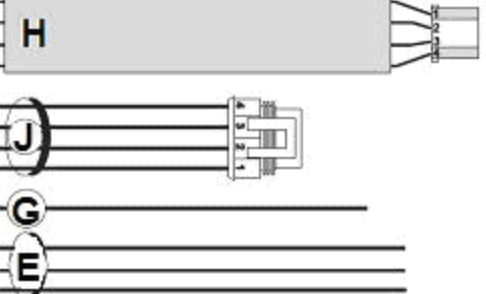
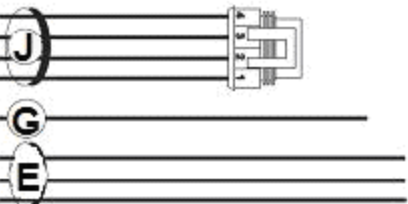
Upon the occurrence of an anomaly (during the gas operating) the LED turns on for a brief time and the switch produces an acoustic warn. If the error is not of primary importance, the vehicle continues to run on gas and the LED stays on up to a resolution (given by the assistance service).

In case of errors (gas operating) that can compromise a correct functioning, the ECU automatically switches from gas to petrol with an acoustic signal. This is emitted even when a deadline for the service checks is set. Normally the switch produces some brief sounds as a reminder in order to check the system control. After that, the acoustic signal is automatically removed by software.

3.8 WIRINGS

3.8.1 ECU PJ+ 48 Pin 4 cylinders main wiring (Single connector)

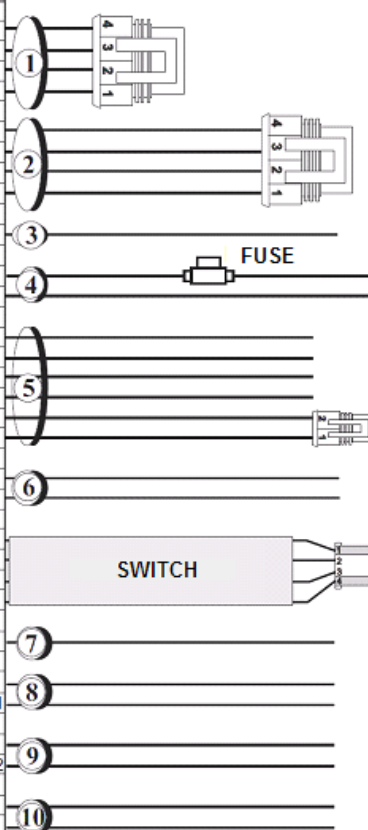
PIN OUT ECU 48 PIN MONO PLUG

	PIN	COLOUR	SEC (mm ²)	LENGHT (mm)	FUNCTION	
	J4	BLUE	0,50	1570	INJB1	
	F4	RED	0,50	1570	INJB2	
	D4	GREEN	0,50	1570	INJB3	
	B4	YELLOW	0,50	1570	INJB4	
	H4	BLUE/BLACK	0,50	1570	INJECU1	
	G4	RED/BLACK	0,50	1570	INJECU2	
	E4	GREEN/BLACK	0,50	1570	INJECU3	
	C4	YELLOW/BLACK	0,50	1570	INJECU4	
	L1	WHITE/RED	0,50	1570	+VKEY CN	
	K4	RED/BLACK	0,75	1030	+ VKEY	
	M3	BLUE	0,75	1310	INJ OUT G1	
	M4	RED	0,75	1290	INJ OUT G2	
	L3	GREEN	0,75	1260	INJ OUT G3	
	L4	YELLOW	0,75	1230	INJ OUT G4	
	J3	BLACK	0,50	450	GND	
	H1	WHITE	0,50	450	TX	
	H2	BLUE	0,50	450	RX	
	M1	RED	0,50	450	+BATT	
	G1	PINK/BLACK	0,50	1700	TEMP GAS	
	H3	BLACK	0,50	1700	GND	
	M2	RED/BLACK	1,00	415+1545	+ BATT	
	L2	BLACK	1,00	1980	GND	
	C1	GREEN	0,50	1600	+ V LEVEL	
	E1	WHITE	0,50	1600	LEVEL	
	D3	BLACK	0,50	1600	GND	
	B1	PINK/WHITE	0,50	1600	+5V EXT	
	C3	BLACK	1,00	1600	GND	
	A3	BLUE	1,00	1600	S.V. GAS 1	
	G2	PINK	0,50	1600	TEMP H2O	
	G3	BLACK	0,50	1600	GND	
	B3	BLACK	1,00	700	GND	
	A4	BLUE/BLACK	1,00	700	S.V. GAS 2	
	A2	BLACK	0,35	2500	GND	
	D2	WHITE	0,35	2500	SWITCH	
	C2	GREEN	0,35	2500	LEV OUT	
	B2	RED	0,35	2500	+SWITCH	
	F2	BROWN	0,50	1200	MAP	
	F1	WHITE	0,50	1200	MAP GAS	
	F3	BLACK	0,50	1200	GND	
	K3	RED	0,50	1200	+VKEY	
	A1	BROWN	0,50	1700	GIRI	
	J2	ORANGE	0,50	2500	CAN H	
	J1	ORANGE/BLACK	0,50	2500	CAN L	
	K1	GREEN	0,50	2500	LINE K ISO	

3.8.2 ECU PJ+ Pin 6 cylinder main wiring (2 connectors)

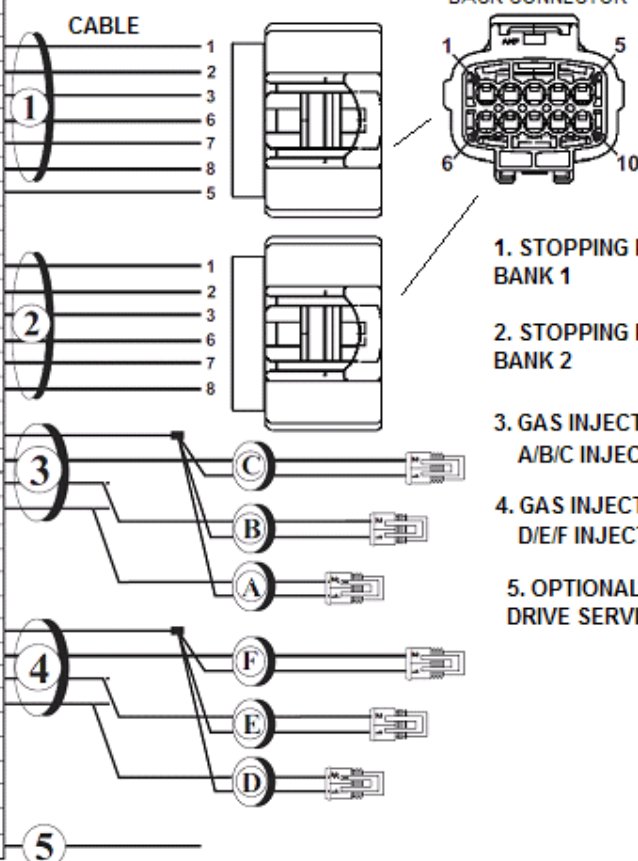
PIN OUT ECU

PIN (J1)	COLOUR	SEC (mm ²)	LENGHT (mm)	FUNCTION
C7	BLACK	0,50	435	GND
C3	WHITE	0,50	450	TX
C2	BLUE	0,50	450	RX
A8	RED	0,50	435	+BATT
A3	BROWN	0,50	1200	MAP IN 1
A2	WHITE	0,50	1200	MAP IN
C7	BLACK	0,50	1185	GND
A8	RED	0,50	1185	+BATT
B2	BROWN	0,50	1700	GIRI
A8	RED/BLACK	1,00	400+1540	+BATT
C7	BLACK	1,00	1970	GND
B1	GREEN	0,50	1600	+VLEVEL
C4	WHITE	0,50	1600	LEVEL
C8	BLACK	1,00	1600	GND
A1	BLUE	1,00	1600	EV GAS1
A4	PINK	0,50	1600	TEMP
C8	WHITE	0,50	1600	GND
A5	PINK/BLACK	0,50	1700	TEMP1
C8	BLACK	0,50	1700	GND
C8	BLACK	0,35	2500	GND
B4	WHITE	0,35	2500	SWITCH
C5	GREEN	0,35	2500	LEV_OUT
B3	RED	0,35	2500	+SWITCH
B8	RED	1,00	1700	+VKEY CN
A6	PURPLE	0,50	1600	LAMBDA-IN1
B6	GREY	0,50	1600	LAMBDA-OUT1
B5	PURPLE/BLACK	0,50	1600	LAMBDA-IN2
C6	GREY/BLACK	0,50	1600	LAMBDA-OUT2
B7	GREEN	0,50	2500	CAN ISO H
A7	GREEN/BLACK	0,50	2500	CAN ISO L



1. COMPUTER CONNECTION
2. MAP CONNECTION
3. RPM WIRE
4. + and - BATTERY
5. LEVEL SENSOR/
SOLENOIDE V. REDUCER/
WATER TEMP. SENSOR
6. GAS TEMP. SENSOR
7. + 12 V KEY
8. OXIGEN SENSOR 1
9. OXIGEN SENSOR 2
10. ISO OBD CONNECTION

PIN (J1)	COLOUR	SEC (mm ²)	LENGHT (mm)	FUNCTION
C4	BLUE	0,50	1570	INJB1
C5	RED	0,50	1570	INJB2
C6	GREEN	0,50	1570	INJB3
B4	BLUE/BLACK	0,50	1570	INJECU1
B7	RED/BLACK	0,50	1570	INJECU2
B6	GREEN/BLACK	0,50	1570	INJECU3
	RED	0,50	60	+VKEY CN
C7	BLUE	0,50	1570	INJB4
C3	RED	0,50	1570	INJB5
A5	GREEN	0,50	1570	INJB6
B5	BLUE/BLACK	0,50	1570	INJECU4
B3	RED/BLACK	0,50	1570	INJECU5
A4	GREEN/BLACK	0,50	1570	INJECU6
B8	RED/BLACK	0,75	1030	+VKEY
C8	BLUE	0,75	1290	OUT G1
C1	RED	0,75	1260	OUT G2
A1	GREEN	0,75	1230	OUT G3
B8	RED/BLACK	0,75	1030	+VKEY
B1	BLUE	0,75	1290	OUT G4
A6	RED	0,75	1260	OUT G5
A7	GREEN	0,75	1230	OUT G6
A8	BLUE/BLACK	1,00	700	SERVIZI

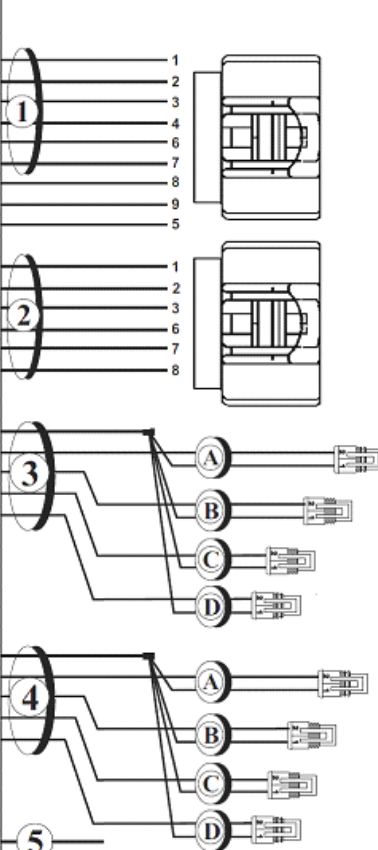


1. STOPPING PETROL
BANK 1
2. STOPPING PETROL
BANK 2
3. GAS INJECTOR BANK 1
A/B/C INJECTORS GAS
4. GAS INJECTOR BANK 2
D/E/F INJECTOR GAS
5. OPTIONAL ELECTRIC
DRIVE SERVICE

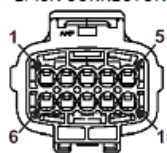
3.8.3 ECU PJ+ Pin 8 cylinders main wiring (2 connectors)

PIN OUT ECU

PIN (J1)	COLOUR	SEC (mm²)	LENGTH (mm)	FUNCTION
C4	BLUE	0,50	1570	INJB1
C5	RED	0,50	1570	INJB2
C6	GREEN	0,50	1570	INJB3
C7	YELLOW	0,50	1570	INJB4
B4	BLUE/BLACK	0,50	1570	INJECU1
B7	RED/BLACK	0,50	1570	INJECU2
B6	GREEN/BLACK	0,50	1570	INJECU3
B5	YELLOW/BLACK	0,50	1570	INJECU4
		0,50	60	+VKEY CN
C3	BLUE	0,50	1570	INJB5
A5	RED	0,50	1570	INJB6
C2	GREEN	0,50	1570	INJB7
B3	BLUE/BLACK	0,50	1570	INJECU5
A4	RED/BLACK	0,50	1570	INJECU6
B2	RED	0,50	1570	INJECU7
B8	RED/BLACK	0,75	1030	+VKEY
C8	BLUE	0,75	1310	OUT G1
C1	RED	0,75	1290	OUT G2
A1	GREEN	0,75	1260	OUT G3
B1	YELLOW	0,75	1230	OUT G4
B8	RED/BLACK	0,75	1030	+VKEY
A6	BLUE	0,75	1310	OUT G5
A7	RED	0,75	1290	OUT G6
A3	GREEN	0,75	1260	OUT G7
A2	YELLOW	0,75	1230	OUT G8
A8	BLUE/BLACK	1,00	700	SERVIZI

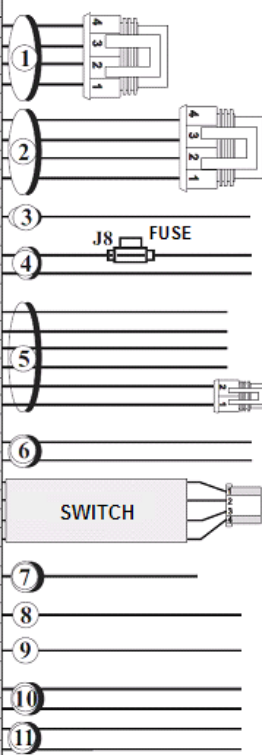


BACK CONNECTOR



1. STOPPING PETROL BANK 1
2. STOPPING PETROL BANK 2
3. GAS INJECTOR BANK 1
4. GAS INJECTOR BANK 2
5. OPTIONAL ELECTRIC DRIVE SERVICE

PIN (J1)	COLORE	SEZ (mm²)	LUNGH. (mm)	FUNZ.
C7	BLACK	0,50	435	GND
C3	WHITE	0,50	450	TX
C2	BLUE	0,50	450	RX
A8	RED	0,50	435	+BATT
A3	BROWN	0,50	1200	MAP IN 1
A2	WHITE	0,50	1200	MAP IN
C7	BLACK	0,50	1185	GND
A8	RED	0,50	1185	+BATT
B2	BROWN	0,50	1700	GIRI
A8	RED/BLACK	1,00	400+1540	+BATT
C7	BLACK	1,00	1970	GND
B1	GREEN	0,50	1600	+VLEVEL
C4	WHITE	0,50	1600	LEVEL
C8	BLACK	1,00	1600	GND
A1	BLUE	1,00	1600	EV GAS1
A4	PINK	0,50	1600	TEMP
C8	BLACK	0,50	1600	GND
A5	PINK/BLACK	0,50	1700	TEMP1
C8	BLACK	0,50	1700	GND
B4	WHITE	0,35	2500	SWITCH
C5	GREEN	0,35	2500	LEV OUT
B3	RED	0,35	2500	+SWITCH
B8	RED	1,00	1700	+VKEY CN
A6	PURPLE	0,50	1600	LAMBDA-IN1
B5	PURPLE/BLACK	0,50	1600	LAMBDA-IN2
B6	GREEN	0,50	2500	CAN ISO H
C6	GREEN/BLACK	0,50	2500	CAN ISO L
B7	YELLOW	0,50	1620	INJB8
A7	YELLOW/BLACK	0,50	1620	INJECU8

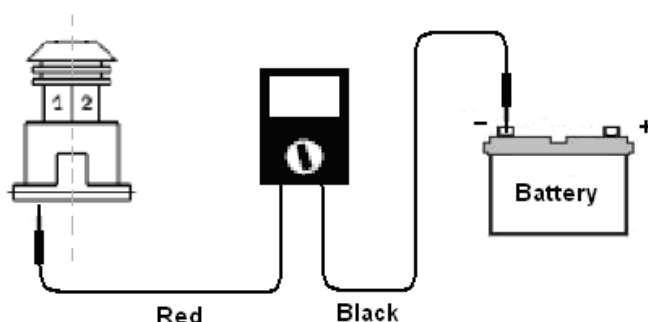


1. COMPUTER CONNECTION
2. MAP CONNECTION
3. RPM WIRE
4. + and - BATTERY
5. LEVEL SENSOR/ SOLENOIDE V. REDUCER/ WATER TEMP. SENSOR
6. GAS TEMP. SENSOR
7. + 12 V KEY
8. OXIGEN SENSOR 1
9. OXIGEN SENSOR 2
10. ISO OBD CONNECTION
11. DISCONNECT WIRES FOR INJECTOR GASOLINE NR.8. ARE CONNECTED TO A CONNECTOR 2 PIN NR. 4 E PIN NR. 9

3.8.4 Fuel injectors excluding wirings

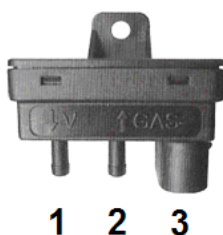
The fuel injectors can be unplugged using appropriate disconnection cables (which are matched with the specific switch of the fuel injector). It is important to remember the signal we want to interpret is always on the one colour cable (switch cable one). For this reason (if we're not sure about the injector polarity), before wiring it is important to control (using a multimeter) that the one colour thread in our cable switch corresponds to the PIN signal of the gasoline injector.

It is necessary to disconnect each gasoline injector and find the pin that brings to the signal with a multimeter in order to actuate this operation. By inserting the ignition key we will have +12 volt on one pin and nothing on the other one. We work on the pin without electricity. If this one is not equipped with an adequate cut injectors wiring, please follow the instruction on point 4.7.



3.9 MAP (Manifold Absolute Pressure)

MAP AA 612 sensor reads the gas system pressures and transforms them into a Volt value.



The V = vacuum intake manifold (pre- installed on the connector, immediately after the accelerator) is connected by a hose to point 1. This one is connected with appropriate plastic Y (also to the reducer hollow). A hose coming from the rail injectors arrives to point 2, it brings the gas pressure inside the system. The pressure values are converted in tension ones and thanks to switch 3 (connected to ECU gas wiring) they're sent to the gas control unit.

4. INSTALLATION

4.1 Equipment / tools needed

- 10 Nm torque wrench.
- Varied spanners.
- Electrician scissors.
- Varied cutters.
- Tap wrenches.
- M8 x 1 tap.
- Tape measure.
- Multimeter.
- Workbench with vice.
- Air compressor.
- Hydraulic pump, 0-400 bar manometer and gas system hydraulic testing pipes tools.
- Exhaust gas analyser, approved by D.M. 628/96, gas system exhaust-

- Personal computer. Minimum requirements : 32 MB processor Ram, 5 MB available on hard disk, VGA resolution monitor
800 x 600, Windows , XP and upper.
- Wire stripping pliers.
- Lift.
- Goniometer or adequate tool in order to set the multivalve grade.
- Electric soldering iron.
- Gas leak detector. Alternatively, use foam or liquid soap or commercial leak detection. It's important it does not contain any corrosive product inside of it (which can be dangerous to rubber elements).
- Diagnostic tool for gasoline system.
- Control unit interface software.
- ECU PJ+ and PC connecting cable.
- Electric portable drill or drill or pneumatic tool with assorted drill bits.

All the equipments must be well preserved and calibrated following the producer specs, if necessary.

4.2 MECHANIC MATERIALS

Oil / greasy
Heat shrinking
Coolant radiator
adhesive Tape
Thread sealant
Protective clothing of the body
Seats protection

4.3 INSTALLER TECHNICAL EXPERTISE LEVEL

The installer must have attent PJ+ system use and installing education course.

4.4 BEFORE BEGINNING THE INSTALLATION

Please actuate the following checks on the engine:

- Air filter: check its conditions. Replace if necessary.
- Electrical components check like: spark plug cables, spark plugs, coils. Please check that the specs are compatible to the vehicle specs and please control the time passed from the last replacement.
- The intake and exhaust valves must be provided by the vehicle manufacturer registration.
- The catalytic converter must be in good operating condition.
- The lambdaprobe must be in good operating conditions.
- With these tools please do a vehicle auto-diagnosis.

In case of anomalies, the non-suitable components must be replaced before the installation.

Nel caso di anomalie riscontrate prima di eseguire l'installazione sostituire i componenti non idonei.

WARNING: IMPORTANT install increasing height respectively: pressure reducer, filter and injector rail. This to avoid oil stagnation of the LPG inside the rail.

4.5 COMPONENTS INSTALLATION

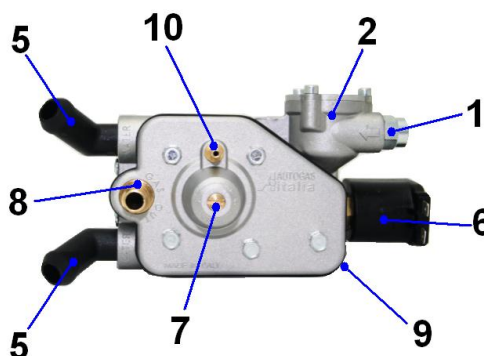
4.5.1 Gas managements components infos

- Engine compartment: install each element in the indicated position. Please secure them to the vehicle body through fixing elements you can find in the conversion kit.
- Do not install any device next to cabin ventilation system air intake or next to engine air intake system.
- Do not install devices less than 150 mm from the exhaust system. In case this is not possible, install a protective metal (or equivalent, heat-resistant) with thickness not lower than 1 mm. Even with protection, never put the item less than 75 mm from the heat source. Check carefully that the pipes (mainly in the rubber ones) will not create bends or sharp bends in their connections

4.5.2 Clamps opening / closing

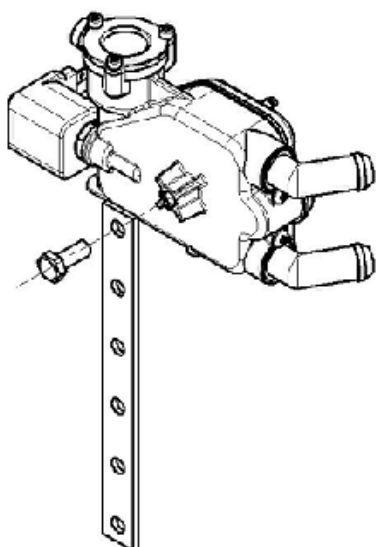
The hose clamps used must keep the connection between pipe and element, extremely fixed. Screw or spring clamps are used on gas pipes: to fix and remove them pliers with extended test leads or screwdrivers are used.

4.5.3 RPG09 pressure / vaporization reducer

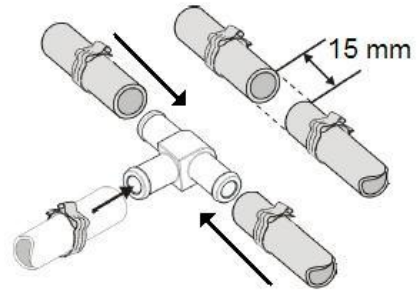
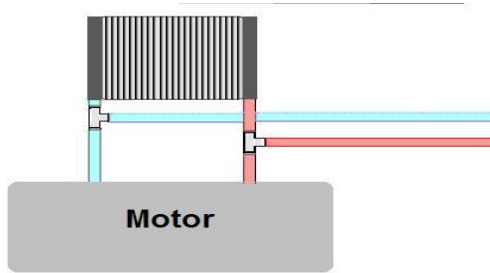


Follow the installation instructions:

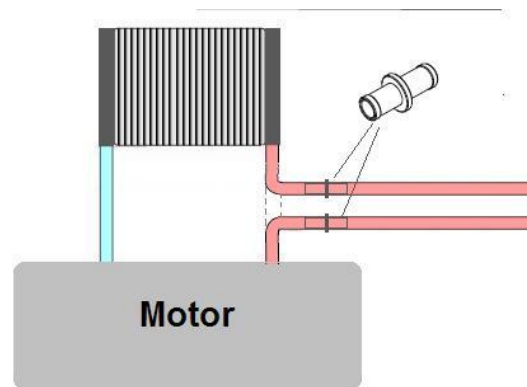
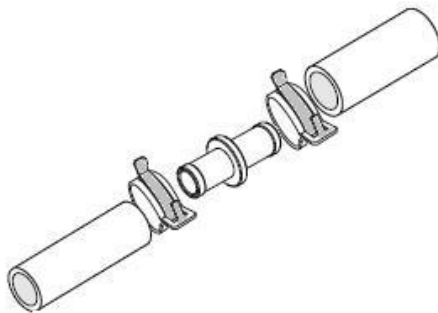
The installation point must allow an easy access for the possible pressure regulation (7) together with an easy maintenance of the reducer itself



- Secure on the vehicle body and **NOT** on the engine or on other components with movements / oscillations induced by the engine: use special bracket supplied in the package (figure).
- Connect the water pipes to the connectors (5). Connectors can be rotated to simplify the installation/connection. Fix the pipes to the connections (5) with the related clamps. The water supply in the gear unit can be equally on both fittings. There's not an inside or outside predetermined way. The water pipe at the opposite end must be connected in parallel with the pipes of the heating system of the vehicle by T joints.



In some cases it may also be in line.



Check carefully that the pipes (mainly in the rubber ones) will not create bends or sharp bends in their connections; this could compromise a good water circulation and so it could affect the reducer overheating with a low LPG evaporation.

- Never install the reducer with pressure regulation screw (7) facedown.

Put the pressure reducer under the vehicle water radiator level to avoid air bubbles occurring inside the engine cooling circuit, during water pipes cutting.

Execute the air cleaning from the circuit once the engine has been started.

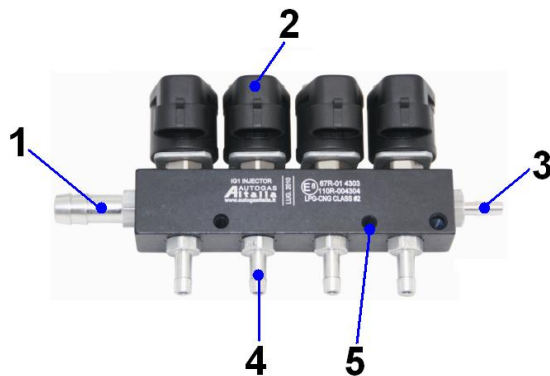
- Clean (suck) the interior of the LPG tank and the ends of the rigid pipes before installing.
- When the installation is complete, start the engine and bring it to normal operating temperature. Make sure there are no water leaks and that the gearbox has a quick warm up.
- Every time the cooling system is discharged (even partially), you must restore the proper level of coolant as directed by the vehicle manufacturer.
- Connect the gas hose to the fitting outlet 8. Connect the depression pipe collector from the outlet fitting 10 into place pressure on the intake collector.
- Connect the high pressure hose to the inlet fitting 1.
- The cover 2 encloses the filter solenoid valve chamber. During the installation, please check that the 3 screws disassembly is easy in order to simplify the filter replacement during the assistance operations. The temperature sensor must be connected and screwed inside hole 6. Coil 9 commands the opening / closing of gas pass inside the pressure reducer. This must be connected to the corresponding wires (+12 V key blue and white ground) from the ECU PJ + wiring.

4.6 LOW PRESSURE FILTER

Work as follows

- Place the filter in an intermediate position between rail injectors and pressure reducer. The maximum length (recommended) of the hose between reducer and filter is 80 cm, while the one between the filter assembly and rail injectors is 35 cm.
- DO NOT slide the gas pipes over strong heat sources in order to protect them and to not overheat the gas.
- Connect the gas pipes to the filter as seen in the picture.
- On the filter body an arrow shows the direction in which the gas must flow.

4.7 RAIL INJECTORS



Follow the instructions:

The rail injector has two holes (5) on the rectangular body in order to facilitate the attachment to the mounting bracket.

Connect the output nozzles (4) from the rail to the manifold nozzles intakes with rubber pipes of internal diameter 6 mm.

Attach the rail injector as close as possible to the intake manifold to have shorter tubes as possible without tight bends.

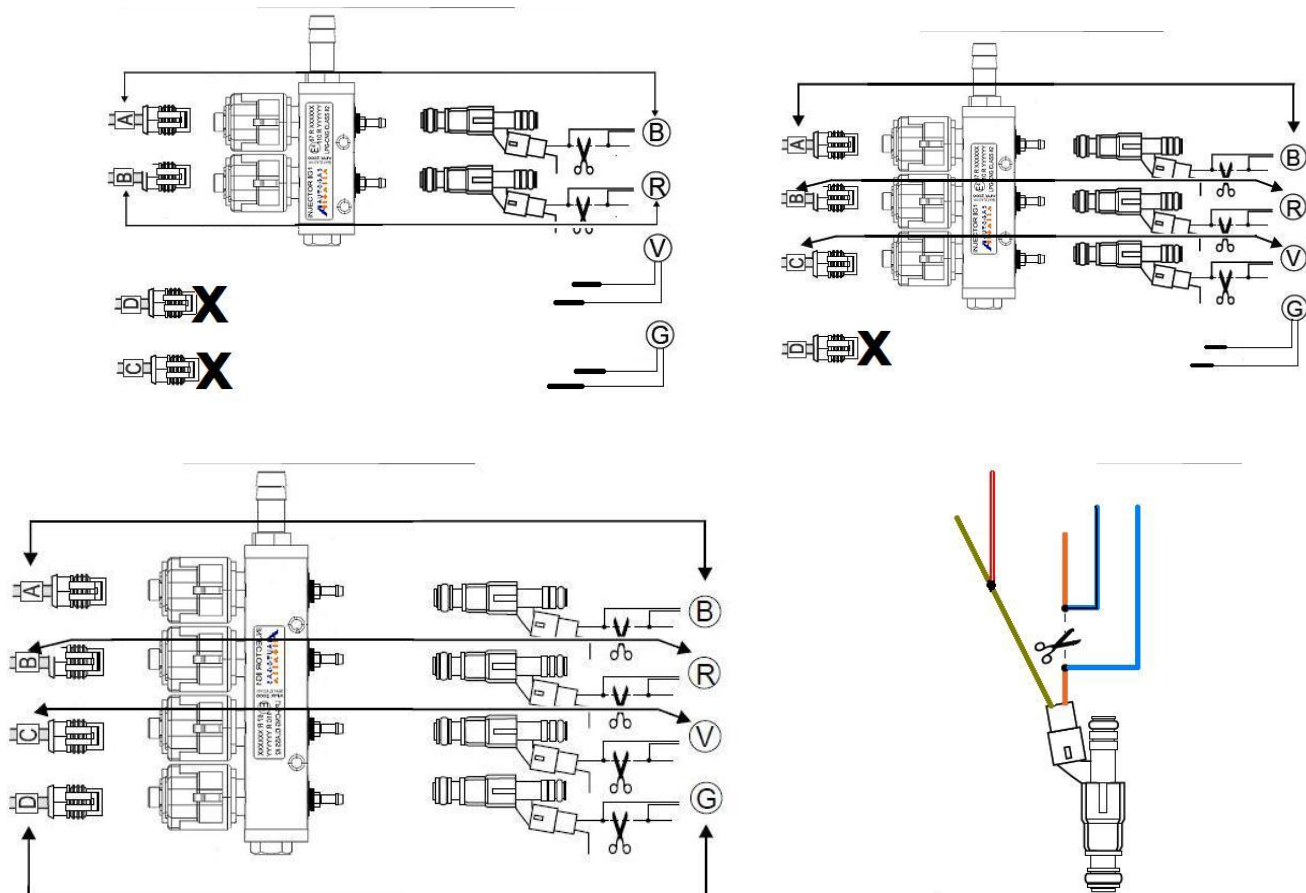
The gas pipe coming from the filter, arrives to junction 1, while junction 3 is connected to the gas reading pressure pipe. This has to be fixed to the MAP sensor in correspondence of PRES.

The coils (2) are connected to the proper connectors on the ECU PJ+ wirings.

The injector rail / manifold tubes must not be longer than 20 cm. The difference in length of the pipes between them should not be more than 3 cm.

WARNING: to the correspondence between the petrol injectors and gas injectors. It is important that the color of the wires (gas injector command, and fuel injector interception) is the same on every cylinder. The cable that controls the first gas injector is marked by the letter A as well as the disconnection cable of the petrol injectors.

The injector marked by the letter 'A' must supply the cylinder on which it is used the wires blu/black to stop the petrol injection (so the first or the fourth). All others are in sequence. The sequence of colors in a 4-cylinder engine is the following: blue / red / green / yellow. For engines with more cylinders please check their wiring diagrams.



4.8 NOZZLE MANIFOLDS

Place in the correct position the inserts on the intake collector, this may be essential for the proper functioning of the whole gas system. They must be installed with care before having removed the intake collector as explained:

- Remove the intake collector without damaging the gaskets. Jot down the connections and all elements assembled on it.
- *Drill the holes on the collector (please follow the given instructions).*
- If no car tab is available, define the position of the nozzles by placing them as close as possible to the fuel injector on the manifold or on the engine crankcase.
- *Check the angle of nozzles and hoses before drilling. Check that the position of the injectors does not obstruct any of the accessories installed on the intake collector.*
Before drilling, delineate the exact points on the collector to facilitate drilling

Apply grease on the drill bit to keep any shavings. If the intake manifold is made of aluminium alloy drill using a 7 mm drill. If the intake manifold is made of plastic, use a 6.8 mm drill. During this phase, the drill must be perpendicular to the surface.

- Thread with a M8x1 tap.
- Clean the intake collector and remove the drilling swarf.
- *Be careful not to damage the threads while tightening the fittings..*
- Use a small amount of sealant on the thread to improve the seal. We recommend Loctite 532 (red) or equivalent.
- *Replace the intake manifold, if necessary please to use new gaskets. Replace all the elements that were removed during disassembly.*

4.9 CONNECTION PIPES

Hot water hose:

Inner diameter 15, D. ext. 23

Gas hose reducer filter:

Inner diameter 12, D. ext. 17

Gas hose from filter to rail injector:

Inner diameter 12, D. ext. 17

Gas hose from injectors to the intake collector:

Inner diameter 6, D. ext. 13

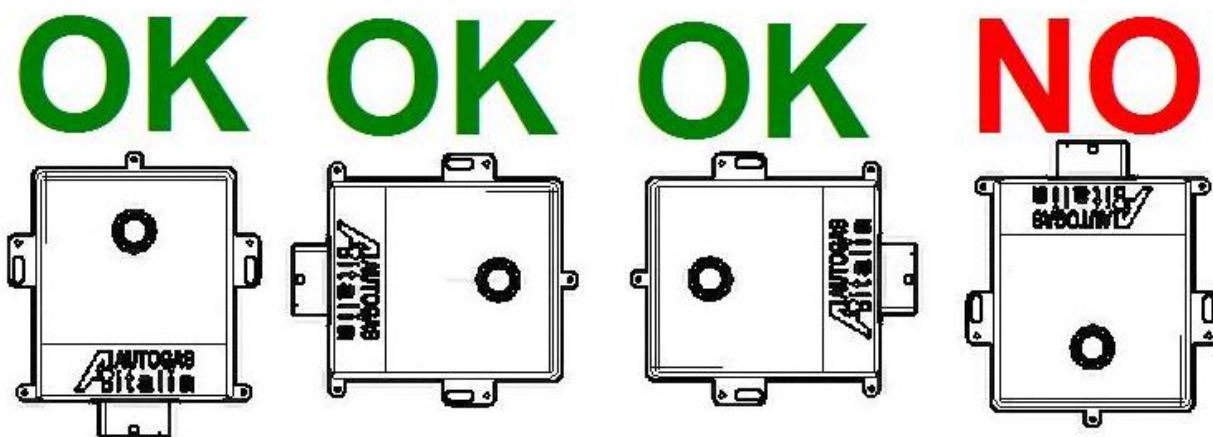
Compensation hose:

Inner diameter 5, D. ext. 10

4.10 ECU PJ+

ECU PJ+ is installed in the engine (both in the driver and in the passenger side). In any case, the installation location is shown on the car tab if available.

If there is no car tab, fix the ECU upright or rotated 90°. Follow the instructions in the figure.



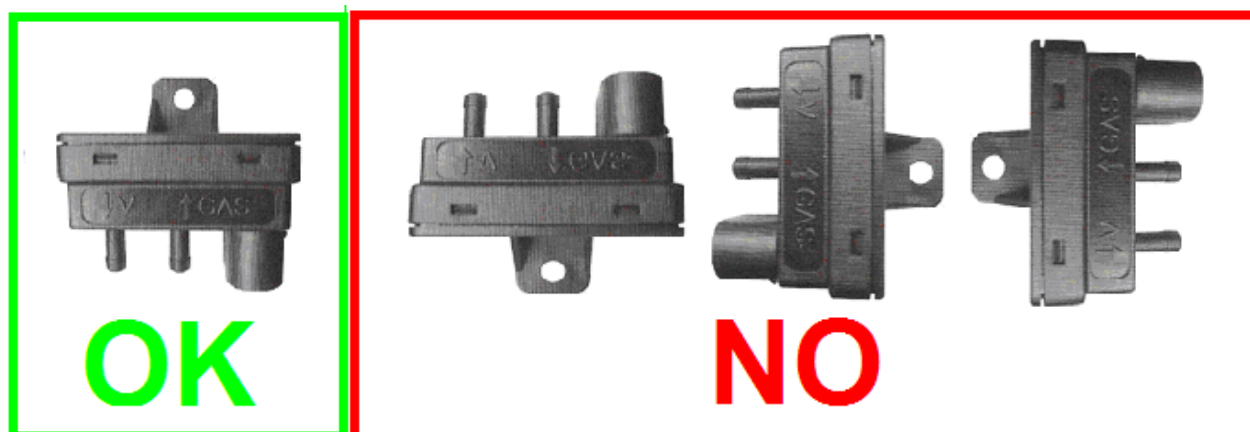
The ECU must be kept away from heat sources, such as the exhaust collector, the radiator, and it must also be secured from potential water seepage.

The ECU position must allow an easy access to main connector 1.

Press button 2 and pull the lever 3 to open the connector in the 48-poles control unit. To close it: once the connector is placed, please close lever 3. For 2 connectors ECU, please remove the appendix 4 and then pull the connector out. To close again: after having positioned the connector, push it to appendix 4.

4.11 MAP

The MAP sensor must be placed in a place protected from the possible infiltration of water and/or excessive heat. The rubber hoses connected to it must have no folds or kinks. The sensor must be firmly fixed to body parts of the car. The following illustration shows how to install and do not install.



4.12 SWITCH

Install the switch in the cockpit (on the dashboard), on the tunnel or in any accessible place for the driver. Drill a Ø 12 hole on which we will need to bring out the wires the switch connector first, and then set the switch itself. Connect the cable from the ECU PJ + gas in the back of the switch. Fix the switch with double-sided adhesive on the rear part of the same, by bringing in the circular part on which we have connected the cable connector coming from the unit into the hole.

4.13 ELECTRICAL CONNECTIONS

Electrical connections, follow these instructions:

- Follow the user installation table.
- The electric cables and casings must be kept away from heat sources such as exhaust collectors, radiator, etc..
- If possible match the original vehicle wiring using of plastic clamps.
- The electrical cables must not be fixed, or in close to moving organs, such as ventilators, belts, etc..
- The connectors and cables must be kept away from high-tension wires, such as power cables or the ignition coil spark plug wire coil.
- Weld the electrical wiring and insulate them with heat shrinking.
- Connect the ground wires to the battery negative or ground original bodywork of the vehicle.

4.14 SYSTEM MAINTENANCE

To obtain the best performance from the PJ + (beyond the normal scheduled maintenance by the vehicle manufacturer) is important to respect the simple essential checks suggested below:

Every 12.500 miles (abt 20.000 km): Replace the spark plugs, check exhaust gas analyser, clean and if necessary, replace the air filter, replace the gas filter .

Every 18.700 miles (abt 30.000 km): Valves regulation check (even if not specified by the vehicle manufacturer).

Gasoline tank parameters: We recommend that you take a few km petrol, each 5000/6000 km driven gas to monitor the proper gasoline functioning. Important for the user: maintain the level of gasoline not less than 1/4 of the tank. If not, a damage to the gas pump may occur.

4.15 FIRST REFUELING

Make a first supply when the car is delivered to the user in order to run a proper test on losses and charging of the tank.

REGARDING LPG: FOR SECURITY REASONS THE TANK MUST NOT BE FILLED MORE THAN THE 80% CAPACITY (FOR EX. 48 liters for a 60 liters LPG tank).

This fill limit is automatically ensured by the multi-valve installed on the LPG tank.

WARNING: If the filling was higher or total, do not leave your car parked for hours in the sun before finishing the excess fuel.

The LPG tank has a 10 years shelf life (European standards). After that it must be replaced with a new one.

If you want to calculate the replacement period, please count 10 years from the system testing date (which you can find on the vehicle registration certificate).

4.16 PRE, DURING AND POST INSTALLATION CONTROLS

PHASES	Checks done
VEHICLE APPROVAL	
Hi – tension cables resistance checking.	
Spark plugs check: state of wear, proper drive characteristics, presence of burns on the ceramic.	
Lambda probes working checking.	
Air filter checking.	
Gasoline car on road reliability checking.	
OBD correctors working check	
Check that no diagnosis light is activated on the dashboard	
Check with diagnostic tool that no error is stored in the vehicle management system.	
Ignition coil checking.	
INSTALLING	
Follow the indication of the installing manual	
Check the position of the mechanical components of the PJ + system to avoid contact with the moving parts of the engine	
Check that the heating water circuit for the vaporizer / reducer is always below the pitch of the coolant circuit engine (important: avoid any air formation in the circuit)	
The original electric wiring (to be connected to PJ +) must match that on the car tab (if available).	
Check that the installation of the electronic components will be safe from possible water infiltration and away from excessive heat. Do not install ECUs close to possible water flows or heat sources.	
Check that the welding of the electrical connections are well isolated	
Pierce the intake collector in order to place nozzles. Important: remember to pierce the closest to the intake valves (if not specified in dedicated instructions).	
Drill the intake collector with care (removing drilling swarf). Sprinkle the drilling tip with grease to hold the swarf. Clean the perforated area with care.	
AFTER INSTALLING	
Check the reducer heating; check that there is a good heat exchange (progressive) until after the engine starting and not just after the thermostatic valve opening.	
Control the quality of the electrical connections done.	
Hi and low pressure pipes must not be damaged (leaks, folds etc.). Check them.	
The reducer water pipes must not have any kind of leak. Check them.	
Check that there are no air bubbles inside the cooling engine circuit. If needed, please purge the circuit following the vehicle manufacturer instructions.	
Check the intake collector tightness. Please check the absence of any kind of aspiration or hose disconnection.	
AFTER CALIBRATION	
Check that the gas driveability is regular and free from voids, breaks, idle speed shutdowns.	
Check emissions with exhaust gas analyser.	
Check that the system calibration PJ + does not alter the correction parameters of the petrol carburetion (OBD correctors).	
Check that the drivability / gasoline power is the same after converting and drove the car to gas.	

5. POSSIBLE PROBLEMS: CAUSES/SOLUTIONS

5.1 Software installation

PROBLEM	CAUSE	SOLUTION
Missing RPM reading	Wrong RPM wire connection	Check the brown wire connection. Alternatively disable RPM wire reading from sw : Parameters / Switch / Pulse / RPM Disable thread
	RPM signal is not adequate (oscillating without real RPM engine movements)	Decide whether to change the value in volts (screen signal). The default value is 2.5 V. (decrease the value in order to read a weaker signal).
Unreadable intake collector pressure	Electrical connection missing	Check and test from diagnosis page. Check that the pins sensors are not bent.
ECU programming stops at a certain percentage value.	PC / ECU connection is missing.	Retry the connection. ECU stays locked if not reset. It must be unlocked by Autogas Italia.
During the calibration phase the gasoline injection times stay at "0".	Wrong wiring installation gasoline injectors excluded.	Install an adequate wiring connection check.

5.2 Idle speed gas functioning

PROBLEM	CAUSE	SOLUTION
Idle speed number is not regular (too high or too low)	Air leaking from the compensation circuit or intake collector.	Replace the damaged pipe. Remove possible aspiration from the collector.
	The gasoline idle speed is not well regulated.	Regulate the gasoline idle speed (if possible) without compromising its idle speed use.
With the air conditioner on, the idle speed interval becomes unstable for a few seconds.	Probably the working area on the map gets too much extended because of the AC compressor starting, so the values of each cell are too far apart.	When the engine is hot, check the values of the area with and without compressor on. Modify any distant value on the map.
The idle speed is unstable (the engine "limps")	Rail injectors-nozzles tubes length is not correct.	Replace rail injectors-nozzles tubes.
	The rail injectors-nozzles tubes are crushed.	
	One of the nozzles-injectors has a different diameter from the others.	Replace the wrong nozzle with a correct one.
	The VAE valve provides a frontal air introduction to one of the collectors of the single cylinders. In this case the collector receives too much air at idle speed.	Control again the nozzle or cylinder installation.
	Big nozzle injectors.	Replace with suitable diameter nozzles. The self calibration automatically provides it.
The engine cannot stay on at idle speed (probable cause: carburation).	Nozzle-injectors or rail injectors replaced without calibration.	Install correct nozzles and calibrate the engine again.
	Small nozzles.	

5.3 IDLE SPEED ENGINE EXIT WITH A SLOW ACCELERATION

PROBLEM	CAUSE	SOLUTION
The engine knocks or it shuts down unexpectedly.	RPM decreasing let the engine working in its mid-low part of the first column, with low map values.	Increase the map coefficients value in the area where the blue dot is at that moment.
	RMP increase when the blue dot descends to the middle part of the map. The engine shuts down because of low carburetion.	Increase the level of the map values in the blue dot route. Also test with AC compressor on.
RPMS hardly rise and the LAMBDA is blocked on its maximum value.	The coefficients in the transitory map are high. Excessive enrichment.	Decrease the cells value where the blue dot transits during acceleration or make thinning from function during calibration.
RPMS hardly rise and the LAMBDA is blocked on its minimum value.	The coefficients in the transitory map are low. Excessive thinning.	Increase the cells value where the blue dot transits during acceleration or make enrichment from function / acceleration.

5.4 IDLE SPEED ENGINE EXIT WITH A STRONG ACCELERATION

PROBLEM	CAUSE	SOLUTION
The carburetion is lean for a few tenths of a second after the sunk: lambda 1 lean. Lambda value remains red (rich).	The map values during the transitory acceleration are too low.	Gradually increase the map values under the idle speed up to the column end. This for at least the first 3 or 4 RMP columns and if necessary make appropriate enrichment from "acceleration".
	Nozzles diameter is not correct	Small diameter nozzles installer or replaced on the rail injectors without a calibration. Do it again.
	The installation causes tubes lengths (it interferes on gas volumes and response times).	Install correct diameter nozzles Move the rail to reduce the rail / nozzles tube length; in necessary approach the nozzles to the intake valves. If necessary install 2 rails (if you got 4 cylinders).
Carburetion stays lean during all the sunk and following acceleration.	The correction coefficients values in the transitory are too high. Gas injection times lower or equal to the gasoline ones.	Gradually decrease the map coefficients in the area below idle speed from column 2 to 5 from the left. If this continues and the coefficients value is smaller than 120, install smaller diameter nozzles.
The engine shuts down or tends to stop.	The carburetion during acceleration is too lean.	See solutions for similar cases of lean carburetion.
	The carburetion during acceleration is too rich.	See solutions for similar cases of rich carburetion.
The engine has a strong shot during the acceleration always in the same RPM range that mainly happens while working on gas.	Possible disadvantage on electrical components such as spark plugs, plug wires, ignition coils.	Check spark plugs wear status cables and ignition coils and if necessary replace the defective parts.

5.5 GASOLINE / GAS PASS

Strict condition needed to switch from gasoline to gas:

threshold RPM exceeding set in PARAMETERS / "RPM SWITCHING gear" combined under the heading "Switching direction";

engine water temperature exceeding set in PARAMETERS / SWITCHING "Transmission time"; according to engine to engine water temperature, to the sub key, and if "Warm start" is enabled.

PROBLEM	CAUSE	SOLUTION
The vehicle doesnot pass gas.	The exclusion injector wiring has been connected incorrectly.	Check the connections.
	The DIAGNOSIS has detected anomalies	Check the cause of the defect and remove it (if possible) and then reset the errors in page DIAGNOSIS.
	The threshold "RPM speed for gear" set is too high.	Check the set value in the program and change if required.
	ECU doesn't read RMP	Check the connection of the RPM reading brown wire .
		Set the "intensity parameter" with value lower than 2.5 V. If this still doesnot allow to read the rRPMs: Parameters/ Switching / disable "RPM thread".
	"Cylinders/Coils" parameter set incorrectly.	Change the settingsuntil the real RPMs correspond to what is read on the program.
	The injectorsdo not open	Check "diagnosis," "gas injectors" in event of a fault, replace the injector / s.
For a few seconds after switching to gas carburetion isnot optimal.	It's not possible to read the water engine temperature value.	Check the electrical connection, if correct, replace the temperature sensor.
	There could be incorrect if carburations"Water temperatures for gear" September istoo low.	Modify "time per gear" at a higher value.
The vehicle passes to gas and goes out..	The solenoid valves on the tank and / or reducer do not open.	Check in "Diagnosis": "solenoid valves and pressure" test, then repair the electrical connection or replace the defective magnetic component.
	Check "sequence gear" / "Overlapping in "Parameters/Switching".	Change the parameter "Overlapping" / "Change in sequence" to the best state.
	Vehicle carburetion is too leak	Repeat the calibration procedure. If the problem persists install nozzleswith a larger hole.
	One injector or more don't work correctly.	Check in "diagnosis" and "test gas injectors" and if necessary, replace defective or single rail injector.
	Pressure decrease fastly.	Verify output tubes from pressure reducer, the gas filter efficiency, clogging of the passages on the high pressure circuit.
The car goes back to gasoline still having gas in the tank	Low pressure.	Clogged filter.
		Regulate the pressure.
		Possible "very poor" gasfilling features..
	It is not possible to read the gas pressure.	Check the electrical connection and the efficiency of the pressure sensor. "Diagnosis" "Pressure Sensor." Read the evaluation test and intervene

5.6 IRREGULAR IDLE SPEED RETURN

PROBLEM	CAUSE	SOLUTION
Shutdown back from extended release.	In the cells of the first two lines of the map (from left), there are high values. This means rich carburetion.	Connect the cells covered during the release phase and return to the minimum value, reduce the coefficients value in the first two lines cells from abt 1500 to 3000 RPMs.
	The "gas opening injectors minimum time" is too.	Increase "Minimum opening" value in "Parameters / Switch" to a higher value. The correct value is automatically set by the system with the selection the right kind of injectors installed.
Engine shutdown with quick return from high RPM.	The reducer is too cold while driving power, the gas density increases and the carburetion is too rich to the minimum return.	Check the thermal water circuit.
The idle speed is not stable and the RPM system oscillates for a few hundreds rpms.	The minimum is not well leveled in the values with and without air conditioning on.	Check the value assumed by the coefficient K during the correct operation at idle speed, by inserting from time to time different loads accessories.
	There are strong discontinuity (over 10 points) between the adjacent map coefficients.	Connect the related map zones better, this to avoid far apart coefficients (in adjacent cells).
	The tubes between rail injectors and nozzles are too long and / or the nozzles are too far away from the engine valves or placed in an unsuitable position on the collector.	Review the rail injectors position in order to decrease the little tubes length (if needed, use the rail injectors splits) or if possible: approach the nozzles hole to the engine valves. Then, if you cannot pierce closer to the engine valves, please use the longest nozzles turning them towards the engine valves.
	Check if the fault is present (also if on a weaker way) also on gasoline.	Remove the gasoline fault

5.7 IRREGULAR OPERATION IN POWER

PROBLEM	CAUSE	SOLUTION
The vehicle seems to lack power because the carburetion is weak.	The coefficients in the map power zone cells are low . The working area of the map is highlighted by the red colour.	Increase the coefficients value of the cells and test it many times during the acceleration. Check it with OBD correctors and response from lambda probe too (from software).
	The nozzle injectors diameter is small and so insufficient to supply the motor in those particular conditions.	During the automatic calibration the correct nozzles dimension is indicated. Please repeat it and check. If not correct, you must replace the nozzles with appropriated ones.
	High pressure decrease.	The filter on the reducer is obstructed: replace it.
		The multivalve on the tank does not supply enough gas.
		The low -pressure filter is clogged. Replace the gas filter.
The vehicle seems to lack power because the carburetion is rich.	The map power zone correction factor in the cells are high.	Decrease the value of the coefficients. Check result with OBD coefficients and Lambda value.
When operating at full power the vehicle passed on gasoline	The reducer temperature decreases too much.	The hydraulic system does not provide a sufficient thermal power to maintain the temperature of the reducer during the delivery of high LPG flows: check the hydraulic circuit and its installation.
	The pressure has dropped below the set pressure value for the automatic backpass to gasoline with low pressure.	Check the gas filter, check the gas in the tank, control any "obstruction" on the high and low pressure tubes.
During the low gears violent accelerations (high RPM), the vehicle pulls violently.	The gasoline over-rewing steps-in and the vehicle goes gasoline.	Travel to a speed lower than rewing.

5.8 MID / HIGH RPM ACCELERATION

PROBLEM	CAUSE	SOLUTION
Delay between	Carburetion map is not correct.	Calibrate the vehicle again.
	The distance between the rail injector rail and the gas injection points into the collector is excessive.	Check the installation. Move the rail injectors to reduce the tubes length and (if necessary) bring the nozzles to the aspiration valves.
	The engine performs many extra injections (the short ones are usually lower than 1.8 ms) and the gas injectors are not enough fast to work correctly with times like these.	Delete short injections: "Parameters / Carburetion / Extra Injections ". Move the slider up to the injected value you want to cut. Never exceed 2.

5.9 ERRORS

The page "ERRORS" (malfunctioning) allow you to see any system components malfunctions during the operation.

If an error is active, after solving the problem, it is possible to reset it from the system memory with button "A" (check Manual Set Up, Errors page).

ER 09 LOW PRESSURE REDUCER DIAGNOSIS

During gas mode the error is reported if the read pressure is extended for a certain time (return low pressure time: set in Sensor/Gas level page on software) at a level:

- lower than 0.5 bar for aspirated engines / 1 bar for turbo LPG engines
- lower than 1.25 bar for aspirated engines / 2.0 bar for turbo CNG engines.

ER 17 ELECTROVALVE REDUCER DIAGNOSIS

Presence of an electrical malfunction on the solenoid valve of the pressure reducer.

ER 18 ELECTROVALVE TANK DIAGNOSIS

Presence of an electrical malfunction on the solenoid multi-valve on the LPG tank.

ER 08 MAP SENSOR ERROR

An error is signalled if the collector pressure is not correct, or in case of electrical faults.

ER 11 GAS TEMPERATURE SENSOR ERROR

An error is marked on the electrical connection of the sensor (optional) that reads the outlet gas temperature from the pressure reducer.

ER 10 WATER TEMPERATURE SENSOR ERROR

An error is marked on the electrical connection of the sensor installed on the pressure reducer, used for the water temperature reading, (that circulating inside of it).

ERR 00 TO ER 07 GAS INJECTORS ERROR

In gas operation the error is reported on the corresponding injector if a certain number of open - load injections or short on the coil of the injector are detected in sequence.

ER 20 GASOLINE INJECTORS DIAGNOSIS

In the control unit a correct excluding-injectors wiring connection is made.

During the gas operation the error is reported when gasoline injections are not detected for a certain time (8 secs) on any cut-off injectors channel. The vehicle must not be in that kind of control and cut-off (in order to avoid any weird gasoline injections choking).

ER 21 GAS CORRECTORS ERRORS

If the gas correctors adaptation map has excessively moved to a rich or lean correction, an error 21 code is activated (arriving to set parameters in production).

ER 15 BATTERY TENSION

With battery voltage too low, problems of correct operation of some electrical gas system device may occur.

5.10 VARIOUS PROBLEMS

PROBLEM	CAUSE	SOLUTION
The switch does not light.	The fuse on the red/black wire is interrupted.	Replace the fuse with a pair value one.
	Key contact missing (+12V)	Check wire connection.
	The connector of the ECU PJ+ wiring is not well connected to the ECU pin.	Clean the connector with specific products
	The switch cable is damaged or not well connected.	Connect or replace the cable
	The switch is broken	Replace the switch
The engine "is lame" with occasional shutdowns and uncertain handling.	The ECU PJ+ has been set with a wrong configuration file.	Check the loaded file and in case of error, reprogram the ECU.
	One or more rail injectors does not work correctly.	Check the functioning and replace if necessary.
	The combination sequence gas rail injectors / exclusion wiring has not been respected.	Check the electrical connection and simulate it with software (page Errors).
Uncertain functioning (especially on idle speed) with gas smell.	Loss of gas in the system. Check all connection points and rubber hoses and high pressure seals.	Check all connection points and seals of rubber hoses and high pressure.
	Valves reducer locations have deteriorated. This has changed the flow characteristic.	Check working pressure, revise the reducer.
The carburetion is rich despite the software leaning at any regime.	The valves locations of the 1st stage levers are worn, and the pressure read is higher than working pressure.	Check working pressure, revise the reducer.
After a few hundred km of driving on LPG, the vehicle shows a sharp deterioration in emissions when driving on gasoline.	The gas carburetion map is not correct.	Modify the carburetion map with the help of infos coming from OBD system.
Water loss from hydraulic circuit.	Badly fixed clamps.	Check the installation again.
	ECU does not have a correct communication.	Remove the power fuse, replace the fuse and within 4 "press the button" Program ".
		Check that the ECU is powered on, the interface cable is connected to the PC and ECU
	The ECU is currently programmed with an obsolete and not compatible version of firmware.	Set the ECU with an updated version.

6 REAR INSTALLATION

6.1 TANKS

The LPG tank (with all its accessories) is installed in the rear part of the vehicle. It contains liquid LPG. During its installation you follow the R67-01 regulation rules. On the tanks a metal plate with different info is applied: manufacturer, actual capacity, diameter, date of production and approval. The tanks can be cylindrical or toroidal.

6.2 CYLINDRICAL TANKS

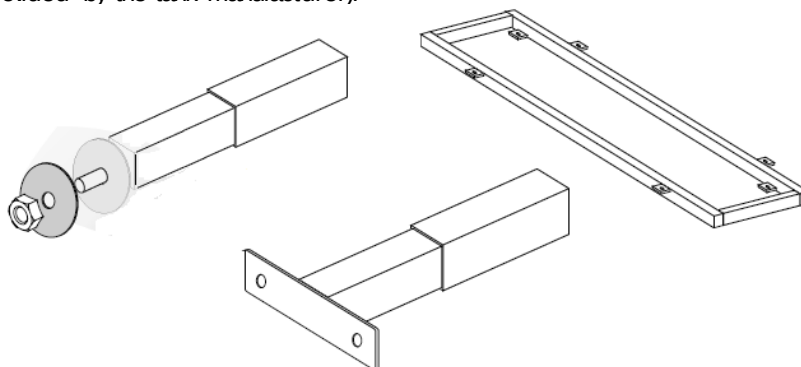
They can be positioned either in the luggage compartment or under the load floor of the vehicle.

In the trunk they must be longitudinal to the travel direction, and very well fixed to the vehicle body with appropriate anchoring systems (respecting R67-01 regulation indications). The tank must be filled up with max the 80% of its nominal capacity. The right liquid quantity filling takes place through the multivalve placed on it. This one must be enclosed in an airtight container connected with plastic tubes outside the vehicle. It ventilates the multivalve area and brings out any possible leak. There are different diameters and lengths. Cylindrical tanks (if placed outside of the vehicle) must follow strict measurement rules (ground clearance, distance from well-specified organs: R67-01 rule).

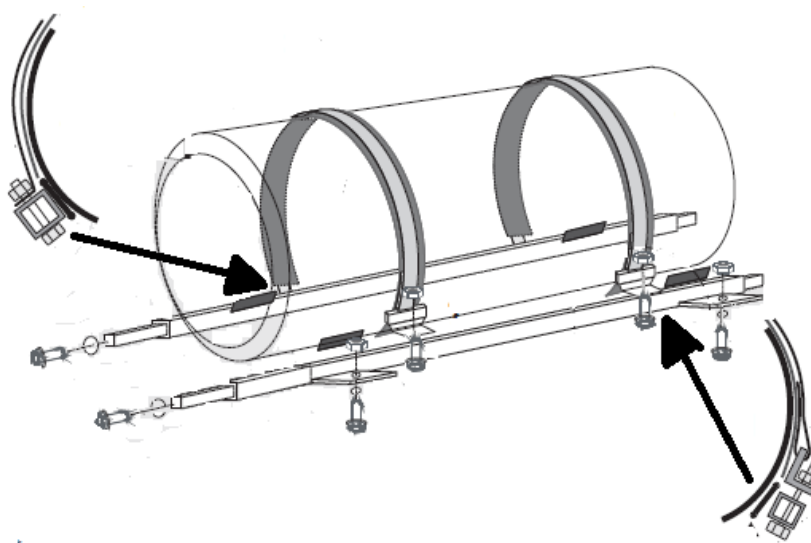
INSTALLATION

The tank should not be in close contact with metal parts of the vehicle. It can be fixed by:

Bars (both round shaped and sliding) ending with anchor points designed for blocking elements. You can also use cradles (generally provided by the tank manufacturer).



The tank must be fixed with appropriate clamps to the main structure or to the containing bars.



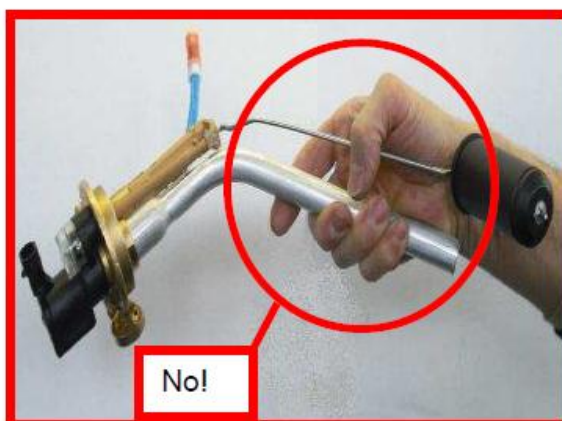
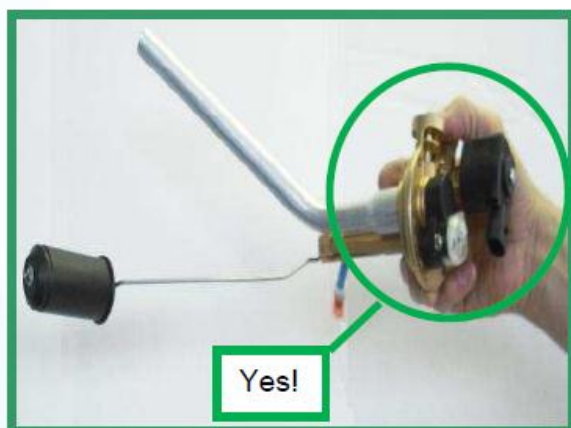
6.3 CYLINDRICAL TANKS MULTIVALVE

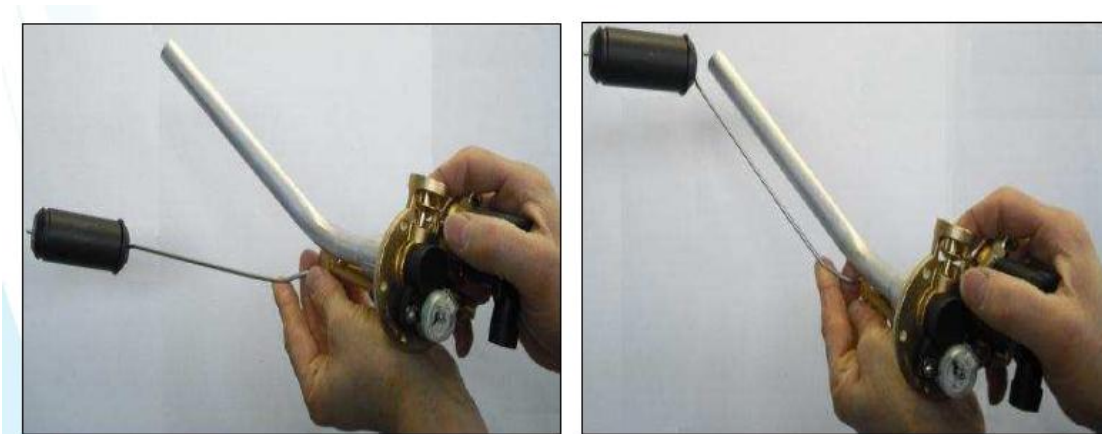
Before placing the multi-valve, remove any remaining paint from the place where multi-valve seal stands, without dips or marks in the metal. Clean the inner part of the tank any water or internal welds residues. If necessary, remove any trace of paint from the threads using M5 tap.



Check the multivalve integrity and the proper functioning of the device limiting charge to 80%.

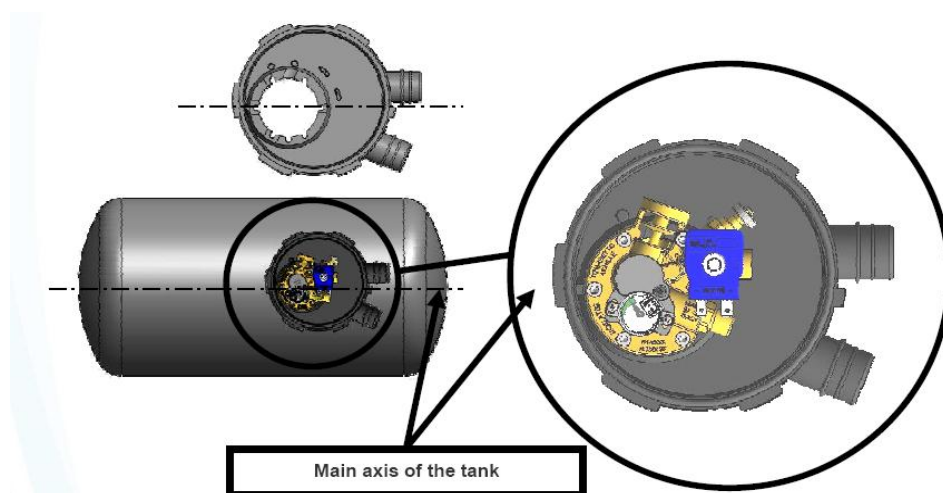
Attenzione! Movimentare la multivalvola afferrandola sempre dal corpo principale in ottone.
È sconsigliato manipolare la valvola afferrandola in altri modi.



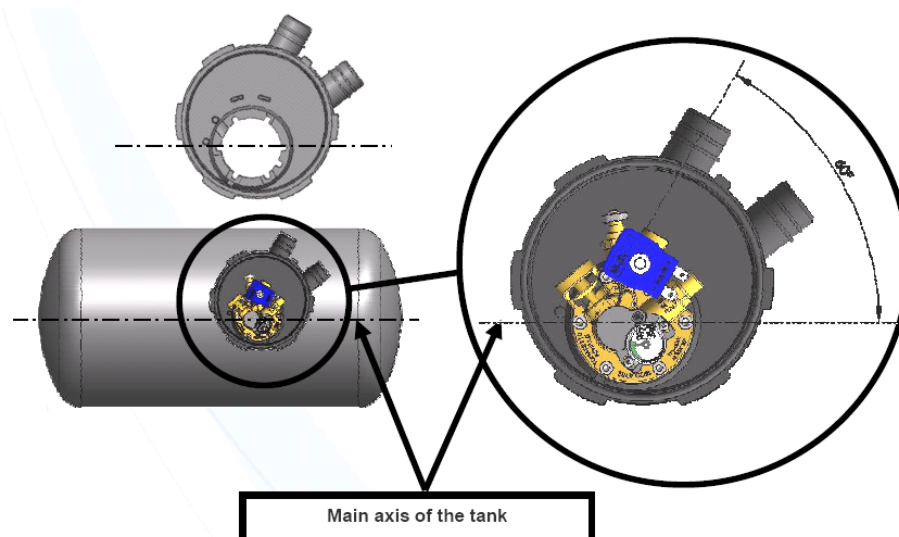


The multivalve placed on the cylindrical tanks (inside the luggage compartment) must be placed in an airtight container. Multivalve and airtight container position change according to the multivalve inclination.

Cylindrical tanks with 0 or 30 degrees ferrule



Cylindrical tanks with 90 degrees ferrule



For a multivalve container correct installation, proceeds as follows: place the O-ring container on the tank ferrule.



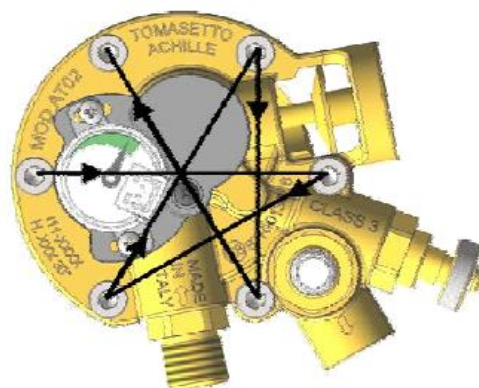
Place the base of the container following the previous directions for 0/30/90 inclination.



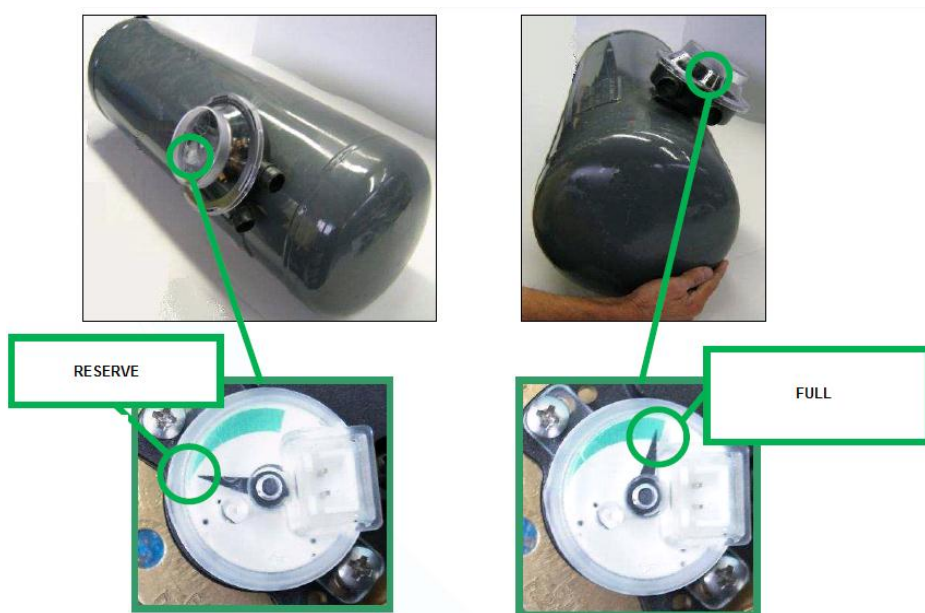
Float and multivalve float insert as shown below:



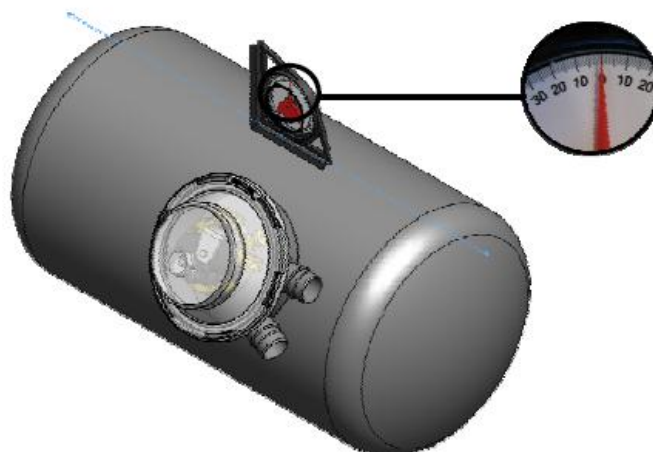
To tighten the 6 screws, remove the coil by unscrewing the fixing hex head that blocks it. To tighten the screws of the multivalve, follow the sequence shown in the image below. The tightening torque of the screws should be 3/4 Nm.



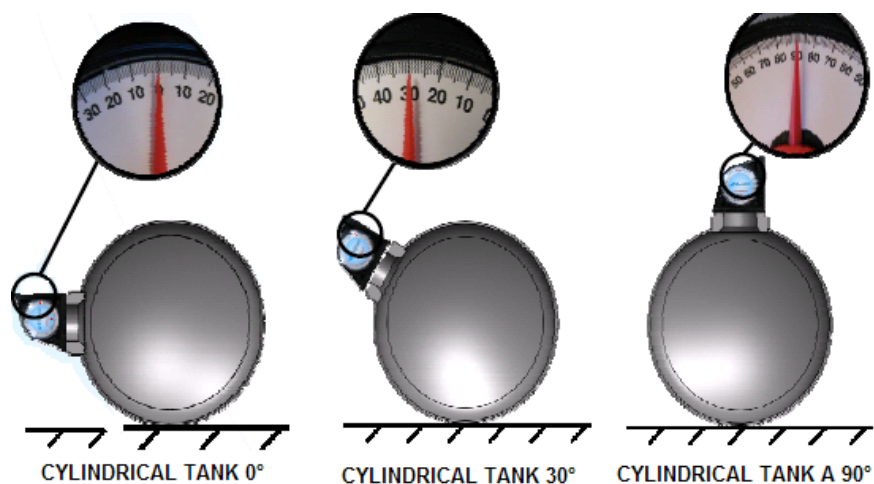
After the container and multivalve installation check that the moving multivalve mechanism is correct and free of obstructions. To do this action once the group is installed, please place the tank on a flat part and incline as shown in the images below. Check the movement of the indicator on the multivalve. The movement of the indicator must correspond to the movement of the float assembly inside the tank.



To check the correct inclination of the main axis of the tank after installation, (+ or - 2 degrees) observe the following illustration:

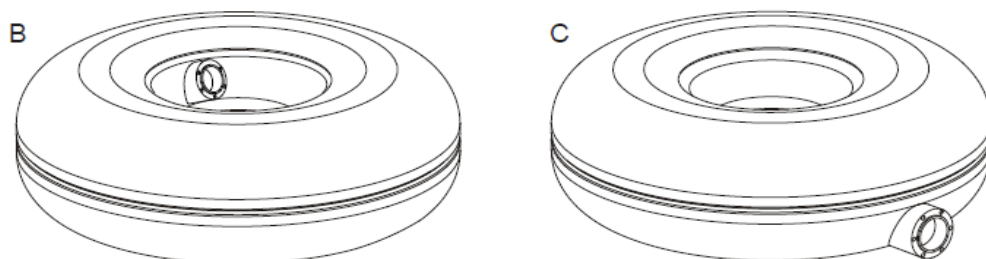


After the installation check that the multivalve and the container inclination match the gradation shown on the multivalve.

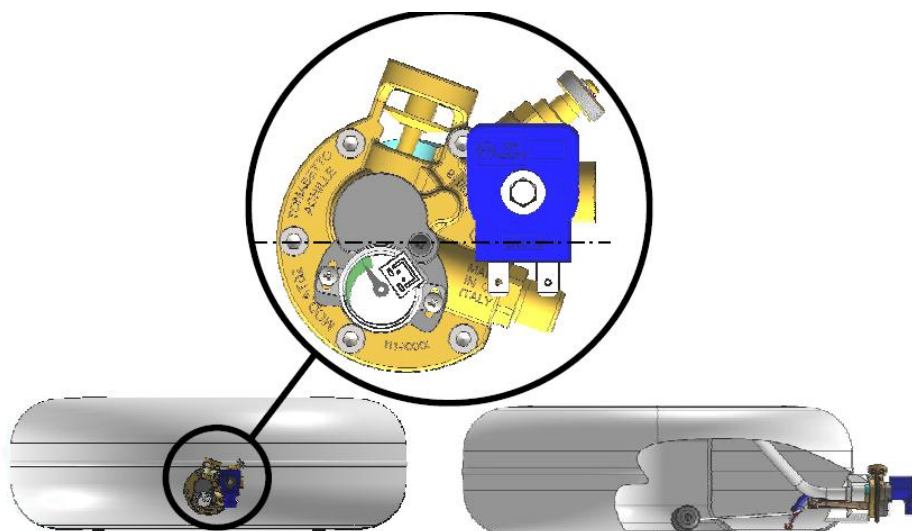


6.4 TOROIDAL TANK

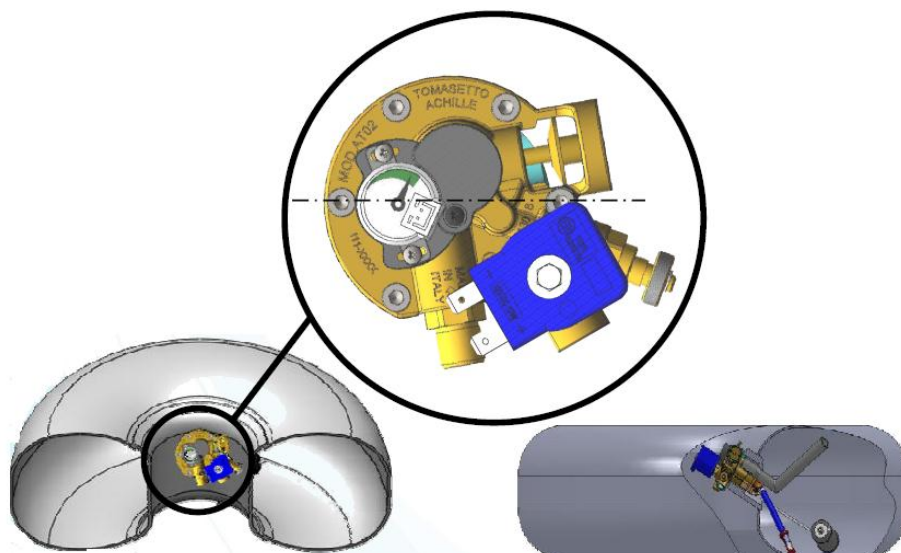
The toroidal tanks are generally placed into the slot where originally the spare wheel is and they can be both (B) internal/external (multivalve position) and (C) internal/external (multivalve position) and also (C) external to the vehicle. If internal/external or only external, the multivalve is external to the vehicle and so it must be protected by a plastic cover. On the other hand, the internal toroidals can have internal or external multivalve to the vehicle. If this is external then protect it with a plastic cover (as said before), but if it's inside the vehicle, the toroidal must have a partial ventilation container. During the internal installation, some flexible material must be interposed between tank and bodywork, this to avoid rubbing between the two metals.



Multivalve positioning in internal/external or external/external tanks. In these two cases the toroidal multivalve has an inclination of 0 degrees..

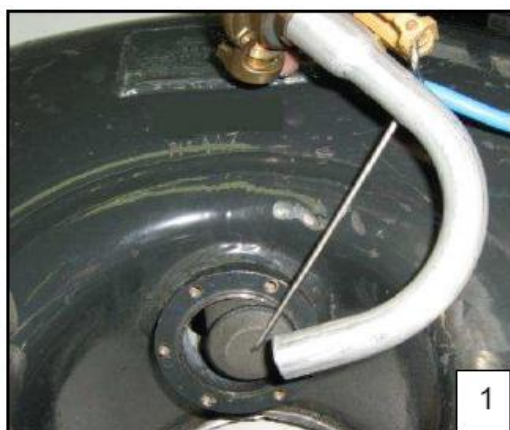


Positioning of the multivalve in internal/internal tanks with 30 or 37 degrees multivalve angle.



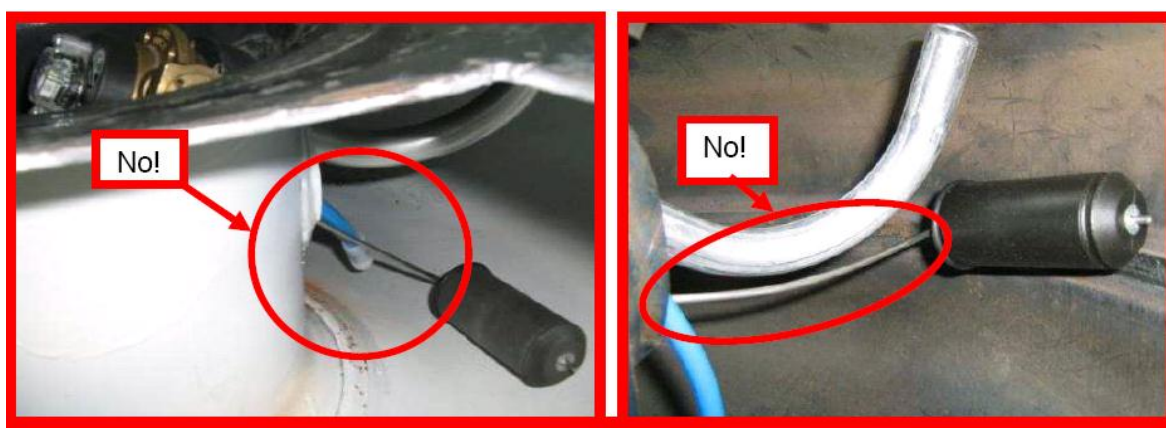
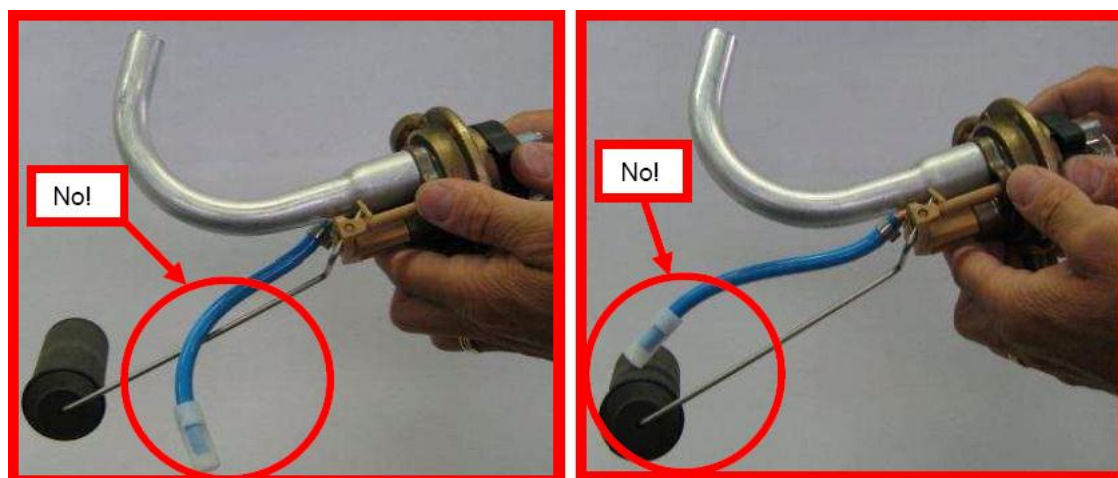
MULTIVALVE INSTALLATION IN 30 OR 37 DEGREES INCLINATION TANKS.

The group inserting (floating / dip tube / overpressure valve vent) is a very delicate action. Proceed as shown in the images below.

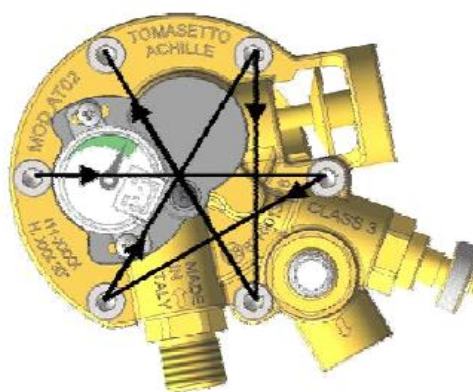


1. Insert the float first
2. Insert the vent conduit for venting valve.
3. Insert the plastic dip tube with care, taking care not to create bends or choking.
4. Bring the dip tube inside the ferrule tank without kinks or choking.

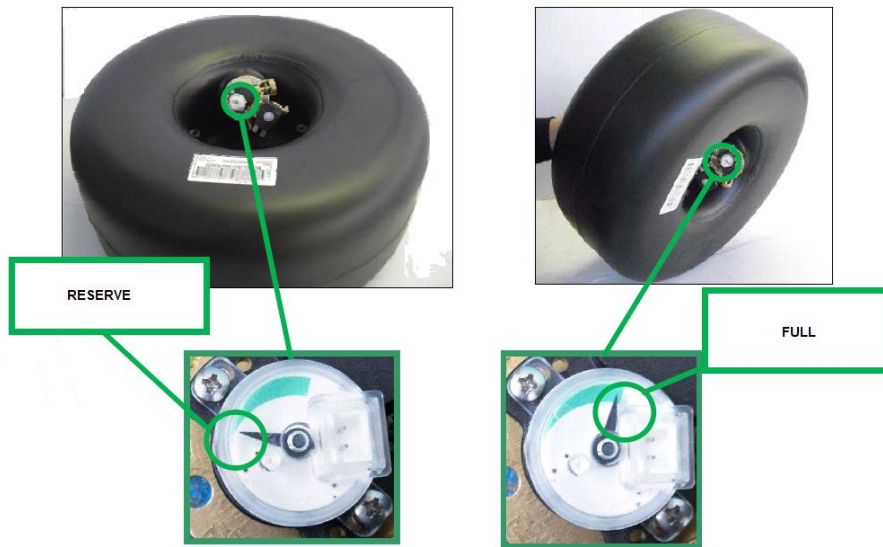
CONDITIONS TO ABSOLUTELY AVOID



To tighten the 6 fixing screws, remove the coil by unscrewing the fixing hex head that blocks it. To tighten the screws of the multivalve, follow the sequence shown in the image below. The tightening torque of the screws should be 3/4 Nm.



Check the correct movement of the floating, comparing it with the indication of the level sensor installed on the multivalve.



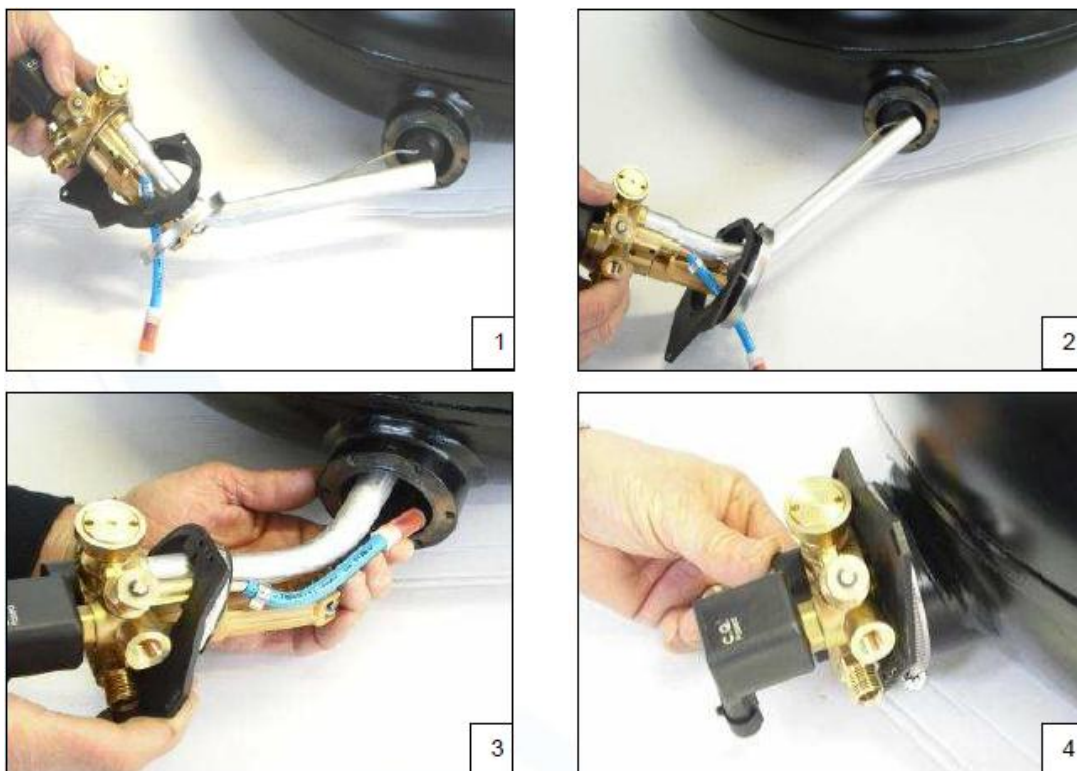
TOROIDAL MULTIVALVE INSTALLATION AT 0 DEGREES

In external/external or just external toroidal tanks, the multivalve is covered with a plastic protecting cover to avoid its damage.

Insert the floating stem and the metallic dip tube in the plastic ring and then in the blocking clamp.

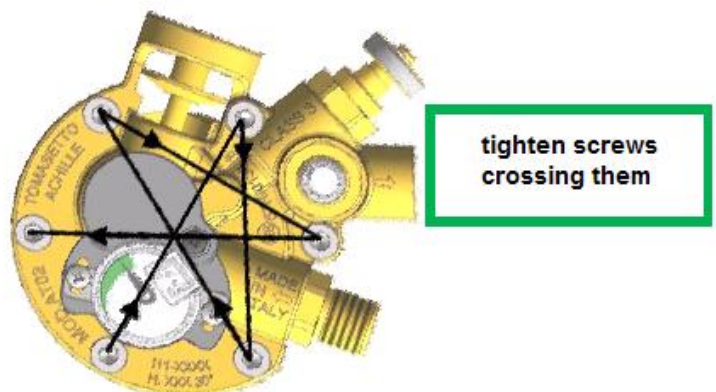
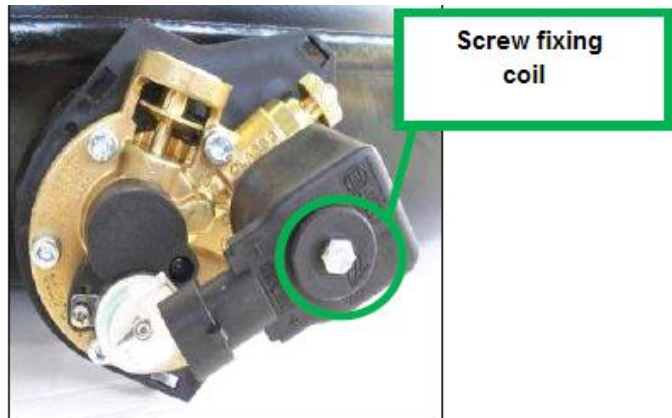
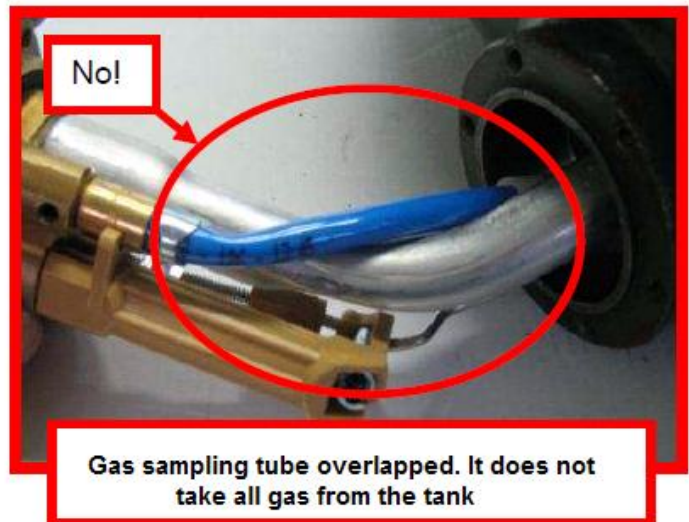
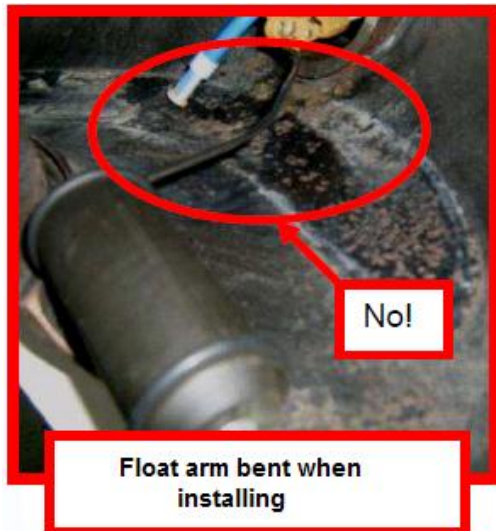


Now proceed with the insertion of the dip tube metallic group, plastic floating and dip tube, as shown in the following pictures.



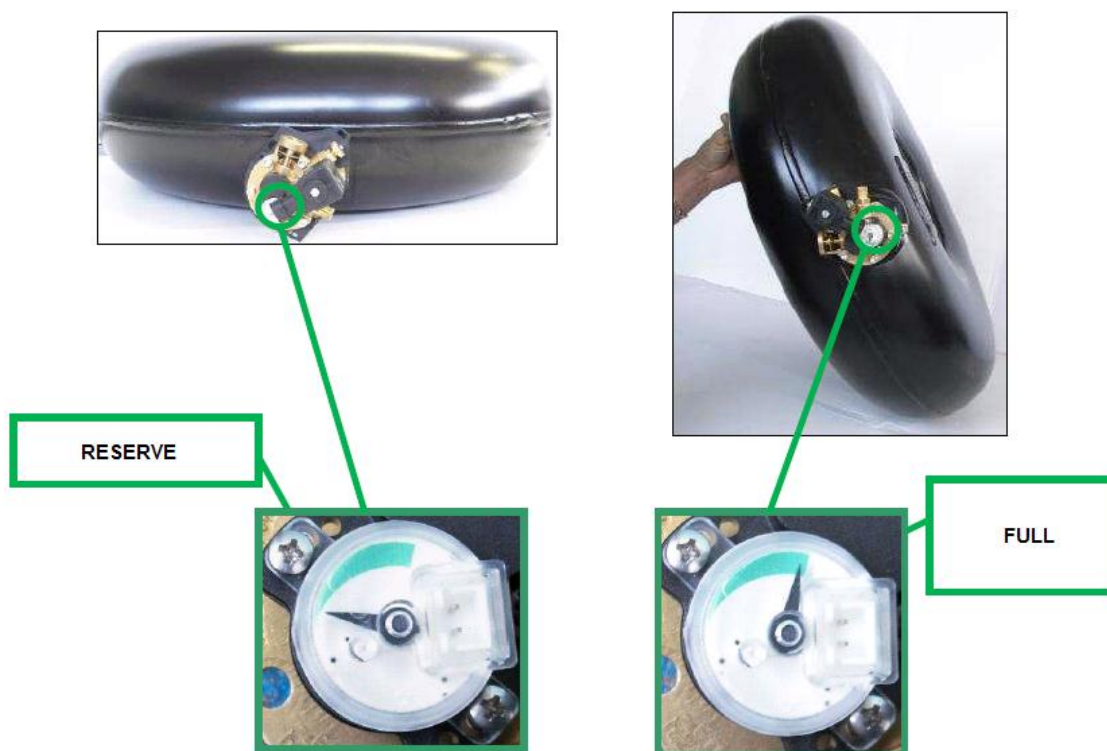
1. Line up the floating rod and metallic dip tube and insert the float in the tank ferrule
2. Insert the metallic dip tube in the ferrule too.
3. Insert the plastic dip tube by moving it slowly with the hand paying attention not to create bends or choking.
4. Overlap the tank ferrule with the protection body valve and its fixing clamp.

During the multivalve installation do not force the floating rod too much (it could bend inside the tank) and make sure that the flexible dip tube is not bent or overlapped. In the pictures below we show two situations to absolutely avoid.



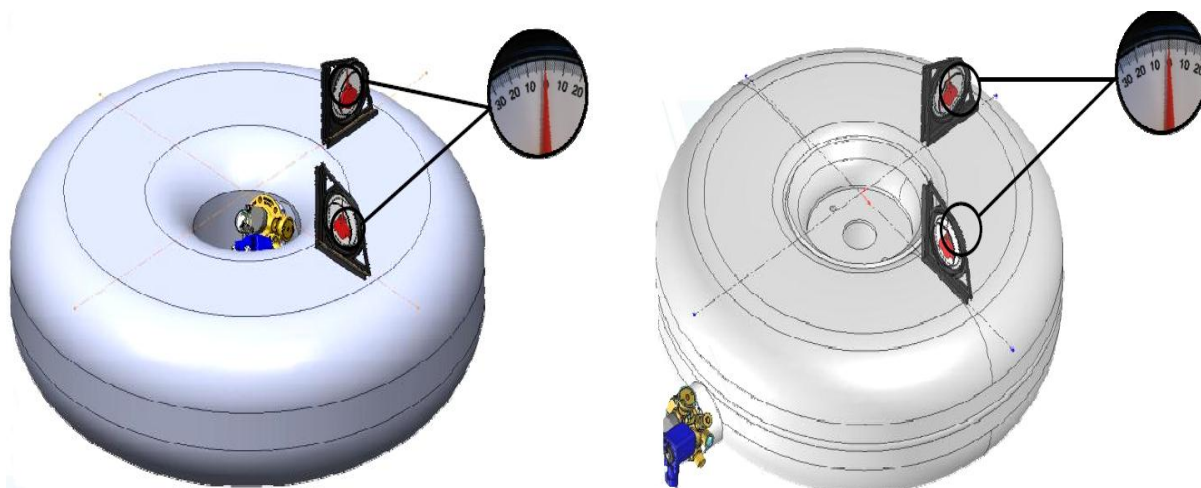
To tighten the 6 fixing screws, remove the coil by unscrewing the mounting hex head that blocks it. To tighten up the multivalve screws, follow the sequence shown in the image below. The tightening torque of the screws should be 3/4 Nm.

Using an external toroidal, check the correct floating rod movement comparing it with the indication (mechanical) of the level sensor installed on the multivalve.



In case of internal/external toroidal, it is not possible to do this operation because the multivalve is installed after placing the tanks in the wheel compartment inside the vehicle. The ferrule outlet hole from the wheel holder containing shell must be done before of that. The multivalve output position must follow all the current regulation requirements.

To check the correct inclination of the main axis of the tank after the installation, (+ or - 2 degrees) please look at the following pictures.



INTERNAL / EXTERNAL TOROIDAL FIXING



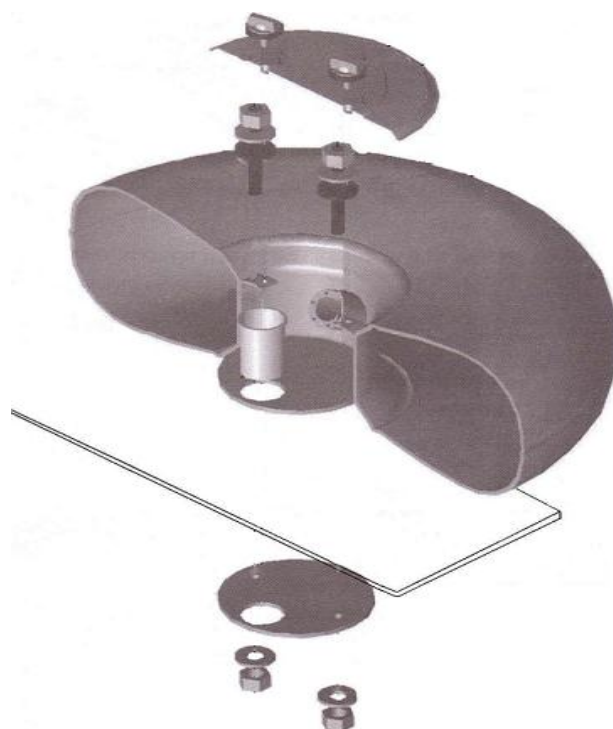
Install the tank in the spare wheel compartment in the trunk, using screws and supplied brackets. Use the external fixing bracket (circular) as a template for the holes. Drill two 12 mm diameter holes. Put the insulating material between the metal sheet and the tank. Put nuts and bolts as shown in the picture in order to tighten the nuts with a 28 Nm dynamometric wrench.

If you need to install external/external tank, use the special system of cross connection (available in different diameters and heights). Use as anchor points, the appropriate devices of the support (4 lateral anchor points, diameter 12 mm for M10 screws) and a center fixing hole of 12 mm in which the central locking support threaded screw has to pass. All nuts must be tightened using a dynamometric key with a load value corresponding to 28 Nm.

The picture below shows the toroidal fixing support, placed outside of the vehicle.



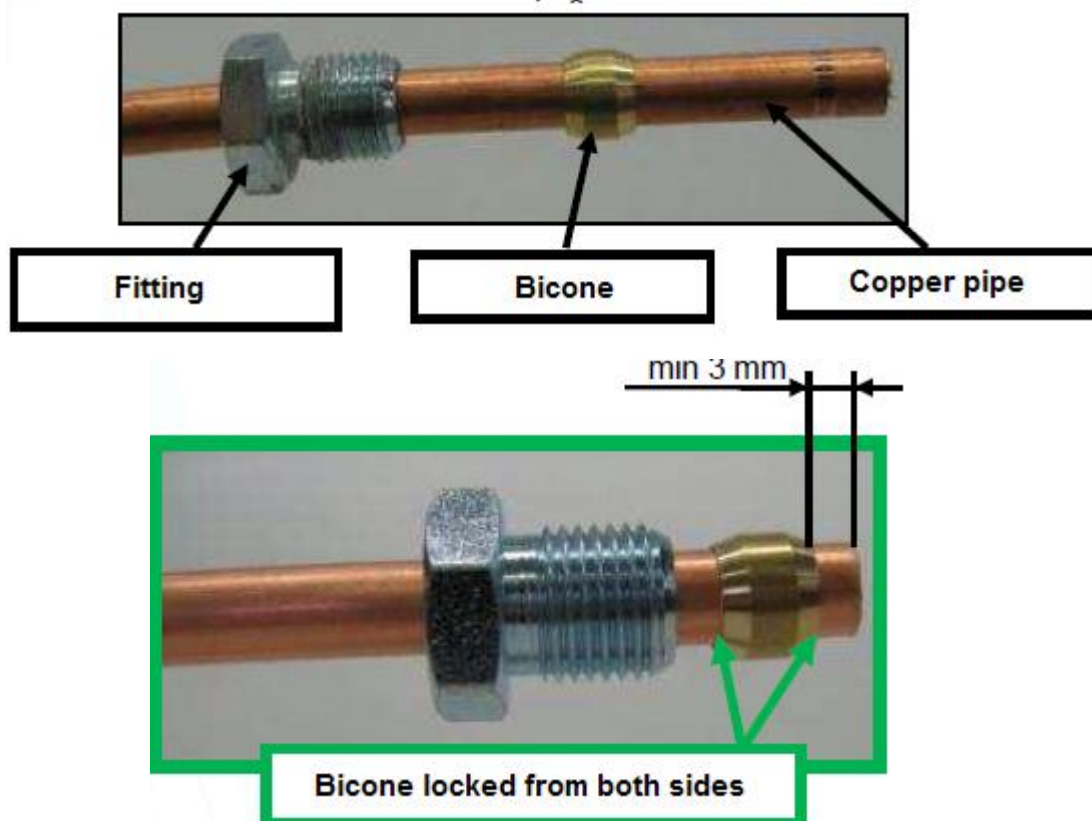
INTERNAL / INTERNAL TOROIDAL FIXING



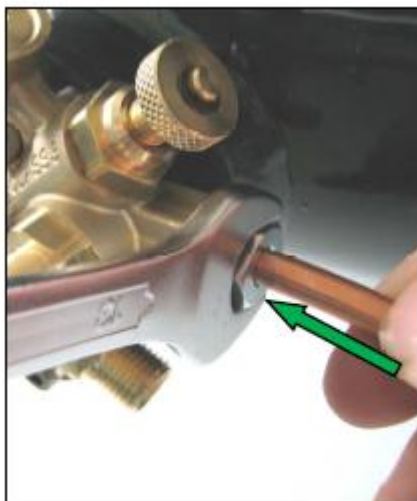
Install the tank in the spare wheel compartment in the trunk, using screws and supplied brackets. Use the external fixing bracket (circular) as a template for the holes. Drill a 50mm diameter, two 12 mm diameter holes. Put the insulating material between the metal sheet and the tank. Put nuts and bolts as shown in the picture in order to tighten the nuts with a 28 Nm dynamometric wrench.

6.5 MULTIVALVE HI – PRESSURE PIPES CONNECTION

Gas outlet connection (engine direction)



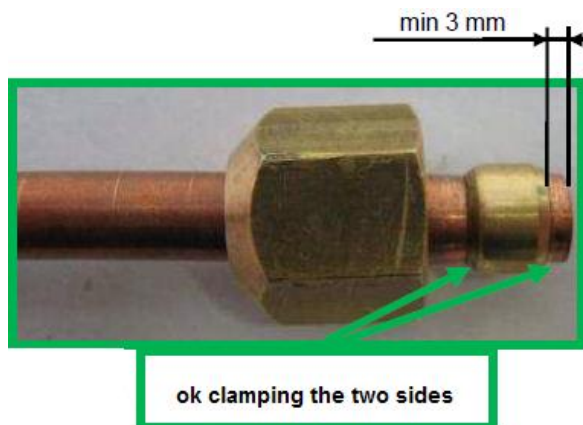
Connect and lock to counter the threaded fitting on the high pressure hose as shown in the image above.



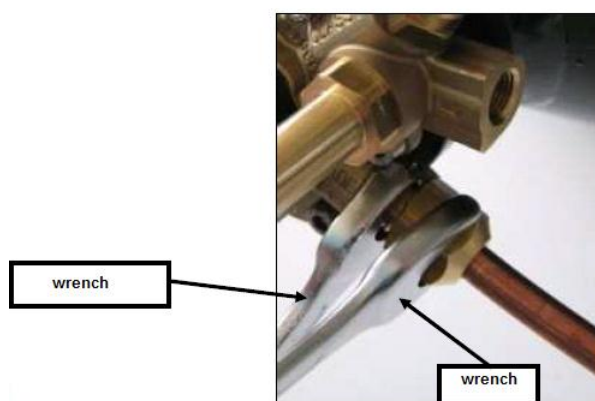
Push the high pressure hose to the mechanical stroke in the multivalve and tighten with AC 13 wrench.

CONNECTION INPUT WITH HI - PRESSURE HOSE COMING FROM CHARGED SOCKET

Connect the copper pipe of the charge using one 1/4 gas connection and diameter 8 double cone provided with the multivalve. Assemble the connection and the double cone on the high pressure hose on a flat surface, as shown in the picture below.

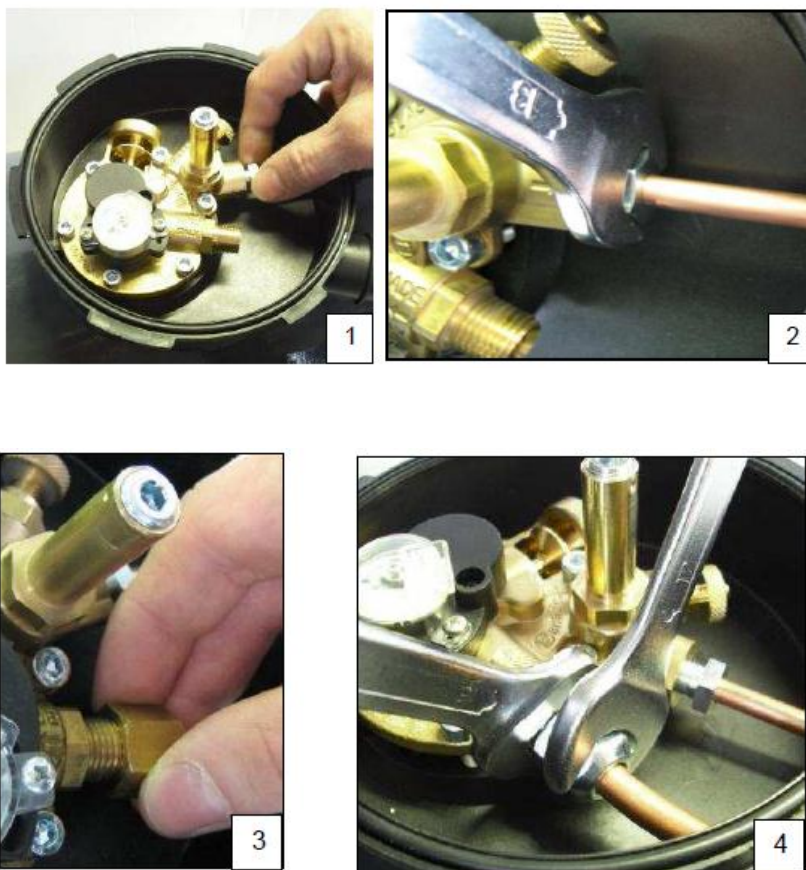


Push the copper tube to the mechanical stroke on the body of the multi-valve, and tighten with wrench AC 17 and AC 16 spare key.

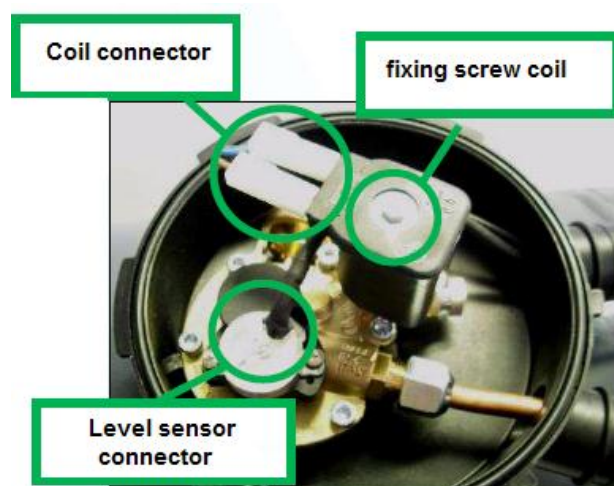


CYLINDRICAL TANKS

After having connected the copper pipes (as explained above), insert them in the hole on the container. Screw the connections by hand for a few theard turns (picture 1). Tighten the outlet tube connection with AC 13 wrench (picture 2). Manually screw the input connection tube for some thread turns (picture 3). Tighten the input tube connection with AC 17 key and AC 16 second key (picture 4). The tightening torque must not be more than 5 Nm.

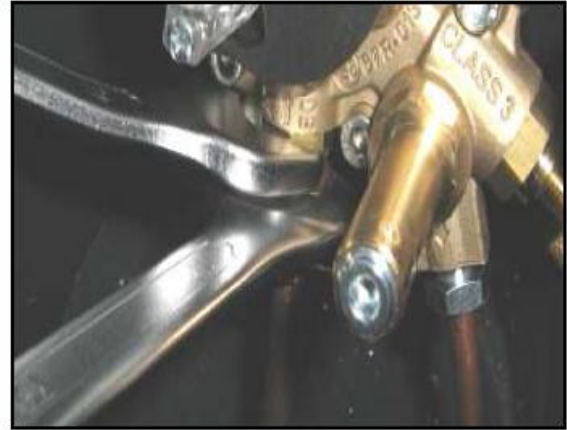


After the hi - pressure connection, replace the coil by tightening with hex screw. Link the level sensor connector and the electrical wires for the coil control. The coil and sensor electrical wires must exit from the container by the same hole where the hi - pressure outlet tube exits. This because both the lines (pressure and power) must reach the engine compartment. Their matching is important in order to facilitate the operator to slide them under the vehicle platform.

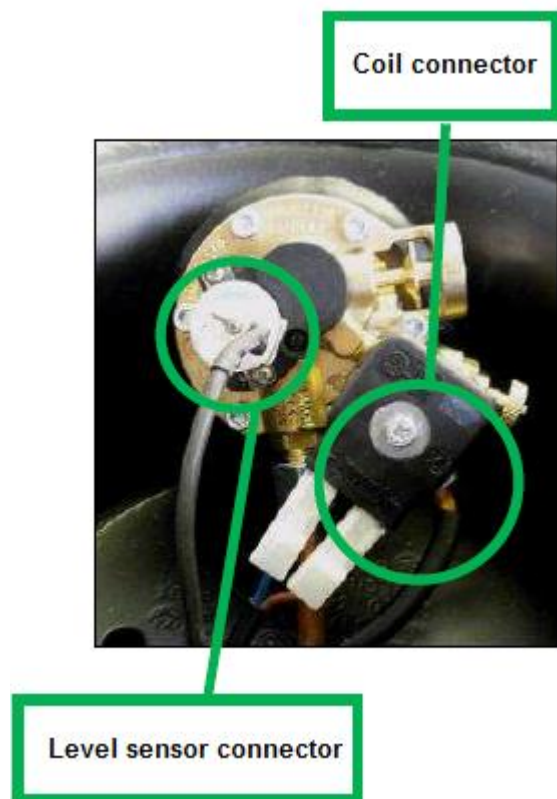
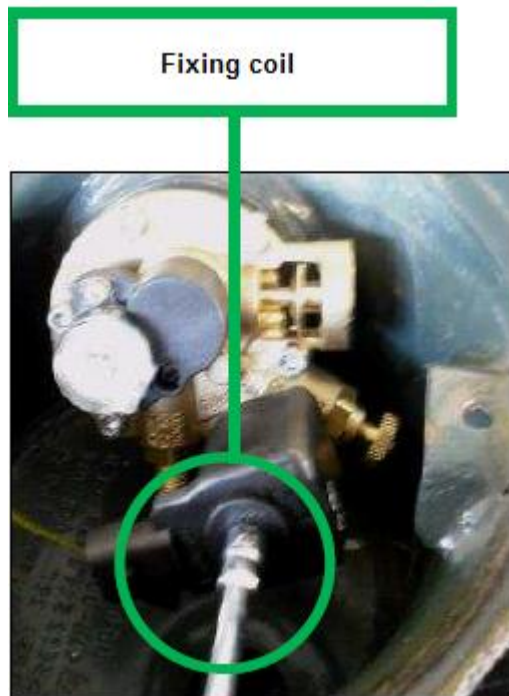


30 AND 37 DEGREES TOROIDAL TANKS

Insert the hi - pressure tubes connections (previously connected on a flat surface) and screw the connections by hand for a few theard turns. Tighten the input tube connection with AC 17 key and AC 16 second key. The tightening torque must not be more than 5 Nm.



Now insert the coil and fix it with the screw and connect the electrical circuits as coil connectors and sensor level connectors.

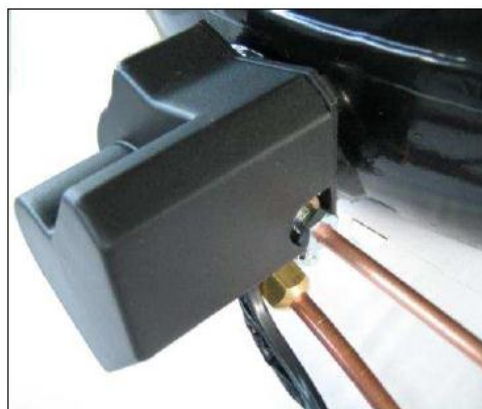


0 DEGREES TOROIDAL TANKS

Insert the hi - pressure tubes connections (previously connected on a flat surface) and screw the connections by hand for a few theard turns. Tighten the output connection with AC 13 key. Tighten the input tube connection with AC 17 key and AC 16 second key. The tightening torque must not be more than 5 Nm.

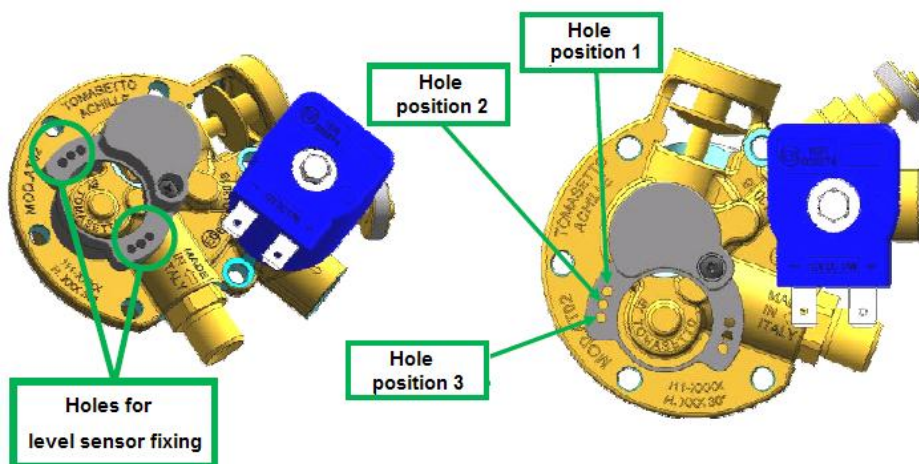


Plug the electrical connections for power supply coil and level sensor. Fix the protective multivalve cover to the spacer previously fixed on the ferrule during the multivalve inserting.

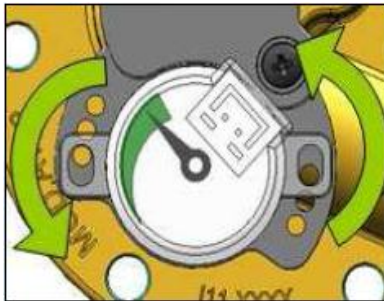


6.6 LEVEL SENSOR PLACEMENT ON THE MULTIVALVE

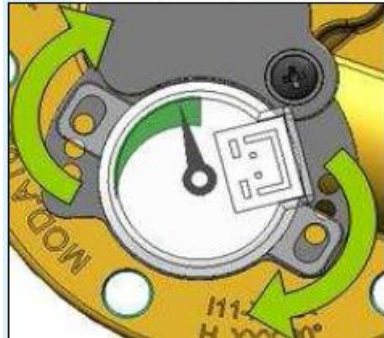
The level sensor installed on the multivalve , receives a signal from the magnets inside the multivalve body. This originates a voltage that determines a signal (through electrical connection) sent to the gas system ECU control. The signals are processed by the ECU and sent to the switch for the power on/off of the LEDs on it. These actions determine the LPG quantity inside the tank. The level indicator movement is quite short for the mechanical characteristics with which the multivalve is built. For this reason, the power on/off of the LEDs on the switch may not be homogeneous in the transition between one LED and another. Some holes have been done to allow a sensor working range variation on its supporting base. These can slightly modify the excursion and the LEDs movement.



The maximum and minimum fuel level in the tank can be changed by modifying the sensor angular position.



To obtain a delay in turning on the reserve LEDs and an advance in the full tank LEDs turning off, rotate the position of the sensor in anticlockwise, using the liquid in the tank. This to use if there are too much km driven with the reserve indication.

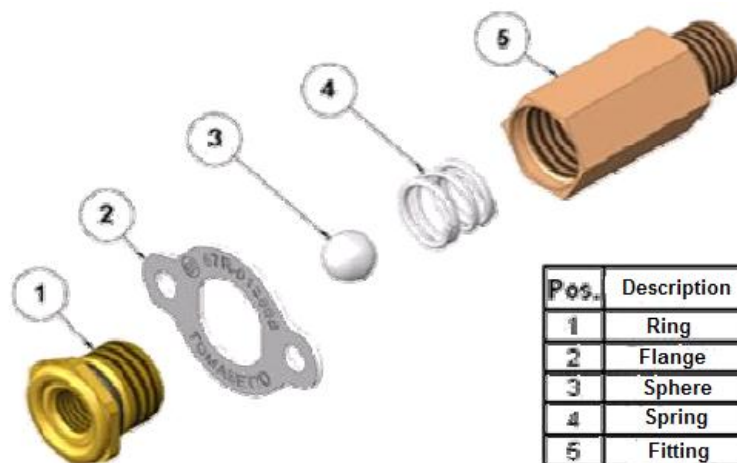


To obtain an advance on the reserve LEDs turning on and a delay on the full tank LEDs turning off, rotate the sensor position clockwise on equal liquid present in the tank. This to use if there are few km driven in the reserve indicator.

The power on/off configuration of the LEDs on the switch according to the liquid inside the tank, can be done by software in the page "Sensors".

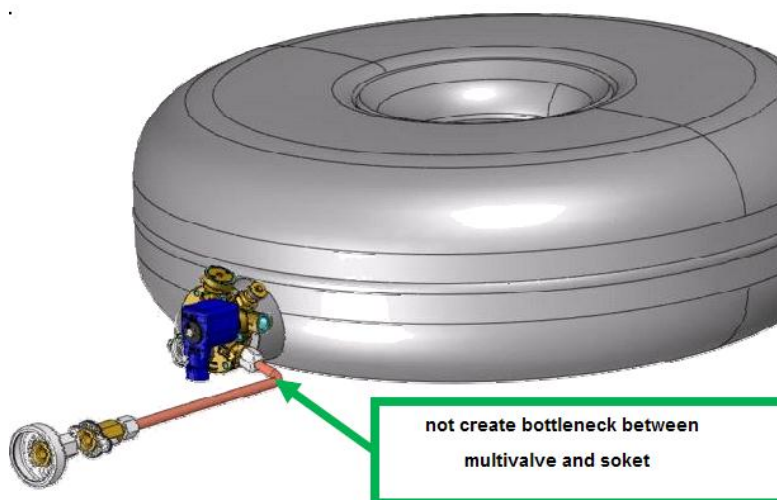
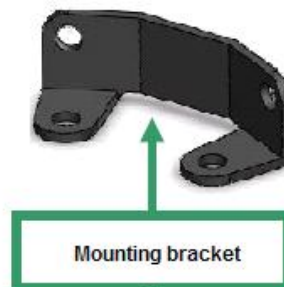
6.7 TANK FILLING SYSTEM

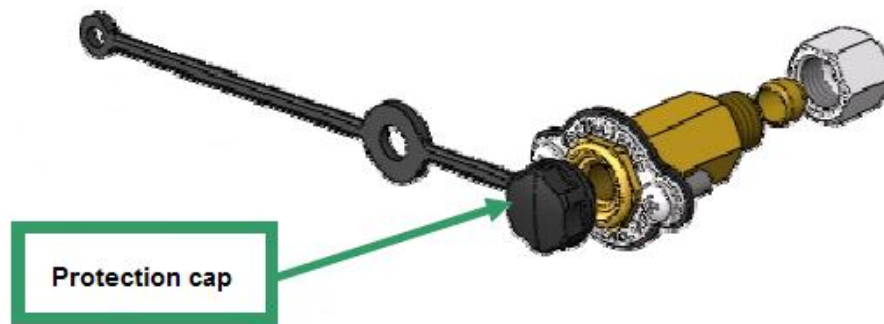
The charging device, allows you to fill the tank with LPG. It can be placed outside of the vehicle (body or underneath it, respecting the rules of the Regulation ECE R67-01), or placed in the slot of the fuel tank cap. The attachment point of the LPG dispenser is shaped to allow an easy hooking of the supply device. Inside the refuelling valve, there is a non-return valve which avoids the liquid/gas flowing out when the dispenser comes off the charge. The charging device is connected to the tank through a hi - pressure rigid/flexible hose. To connect the tubes on the charging device you must do the same operations to connect the hi - pressure tubes to the multivalve.



Pos.	Description
1	Ring
2	Flange
3	Sphere
4	Spring
5	Fitting

The device must be installed in a visible and accessible position. It must be protected from any possible hit or dirty penetration. Its positioning must allow an easy hooking of the dispenser by the operator, and even if you use extensions it is recommended to calculate any possible obstructions. In the following images you can find some examples of charging device installation.





CHECKS TO DO AFTER THE MULTIVALVE AND CHARGED SOCKET INSTALLATION

Refill the tank with some LPG liters.

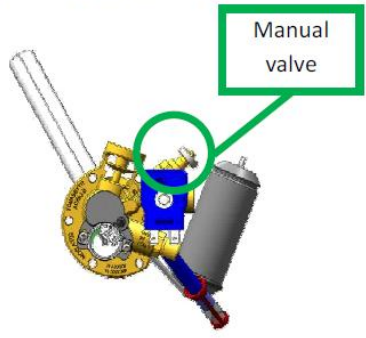
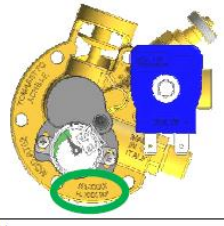
Check the absence of gas losses from all the junctions and rubber seals.

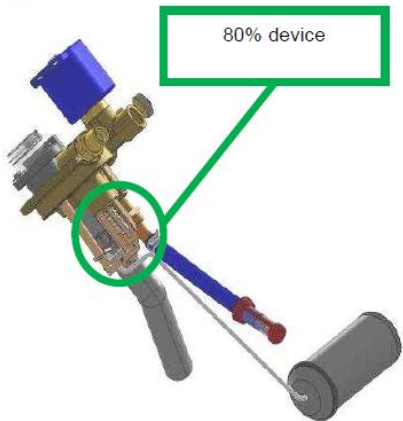
Refill the tank completely (if no losses are found) to check the multivalve 80% filling device correct functioning.

On the page "DIAGNOSIS" of the ECU management software you can find the control of the solenoid valve (placed on the multivalve) correct opening.

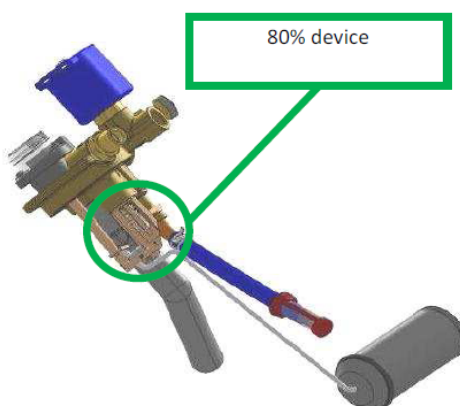
TROUBLESHOOTING

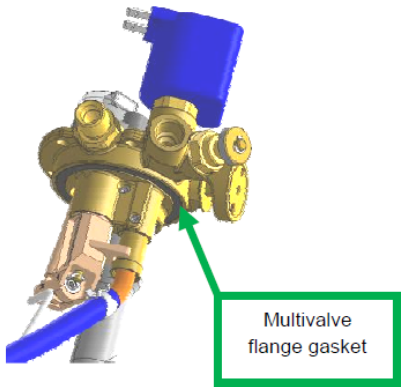
Each maintenance operation must be performed without LPG in the tank and in safety conditions. It's strictly forbidden to modify or tamper the multivalve and its accessories.

Failure	Cause	Corrective Action
The engine does not work with LPG	Manual valve closed	Open the manual valve 
	Excess flow valve locked in the close position	Close the manual valve and reopen it after a few seconds
	Bottleneck or damaged pipes	Replace the hoses
	Electrical connections are disconnected	Connect correctly the electric wires and/or verify that there are no interruptions
	Presence of impurities inside the solenoid blocking the passage of the gas	Replace the multivalve
	Installation of a model of multivalve not correct	Install a correct multivalve according to tank size 
	Shut off valve damaged	Replace the coil. If replacing the solenoid coil, the multivalve doesn't work, replace the multivalve
	Insufficient flow rate to reducer due to small quantities of LPG inside the tank	Refilling

Failure	Cause	Corrective Action
Filling not possible	Impurities that have blocked 80% device or non return valve	Verify that the tank is empty. Remove the multivalve from it, then remove impurities with compressed air 
	Impurities that have blocked inlet non return valve	Replace the multivalve
	Enervation of multivalve inlet fitting that blocked inlet valve	Replace the multivalve
	Dirt or impurities (small stones, etc.) entered the filling valve	Replace the filling valve
	Bottleneck on the pipe from filling valve to multivalve	Replace the pipe

Failure	Cause	Corrective Action
Noise and vibration of the multivalve during refilling operation	Filling station pump pressure insufficient	Change the filling station
Wrong level indication	Float rod blocked inside the tank	Check the correspondence between the tank size and the multivalve size, if not remove the multivalve and install a right one
	Plastic pipe overlapped on the float rod	Remove the multivalve from the tank, reposition the plastic pipe and assembly the multivalve accordingly to the instructions
	Damaged Level sensor	Replace the level indicator and set it according related instructions
Wrong fill of the tank	Wrong installation of the tank	Check that installation of the tank is according to related instructions, in particular check that tank is put parallel to the floor
	Float rod damaged or bent	Check the correct 80% setting to an equipped service center. If the float rod is damaged replace the multivalve

Failure	Cause	Corrective Action
Filling the tank to 100%	Float rod damaged or bent during installation	Check the correct 80% setting to an equipped service center. If the float rod is damaged replace the multivalve
	Wrong assembly of the multivalve in the tank	Assembly the multivalve according to the related instructions
	Wrong installation of the tank	Place the vehicle on a perfectly horizontal plane during refilling Check that installation of the tank is according to related instruction
	Filling station pump pressure insufficient	Change the filling station
	The 80% valve is blocked by dirt or impurities	Make sure the tank is empty, than remove the multivalve and clean it with compressed air If it is not possible, replace it 
	Plastic pipe overlapped on the float rod	Remove the multivalve from the tank, reposition the plastic pipe and assembly the multivalve according to related instructions
	Float rod blocked inside the tank	Check the compatibility of the tank and the multivalve. Check if the float rod is conformed to original version and install the multivalve according to related instructions

Failure	Cause	Corrective Action
Lpg leak from the tank	Low torque of flange fixing screws	Tighten up correctly the 6 screws of the multivalve to the tank; fixing torque should be from 3 to 4 Nm
	Damaged Tank Ring	Remove the multivalve and remake the operation explained at page 12
	Multivalve flange gasket damaged 	Replace the gasket
Fitting threads of inlet and outlet damaged	Excess fixing Torque	Replace the multivalve
	Wrong Screwing of the inlet and outlet fittings	Replace the multivalve

Failure	Cause	Corrective Action
Failure of the level indicator	Electrical wire disconnected	Connect the electrical wire according related instructions and check that there are no interruptions
	Break of magnet holder during the installation of multivalve	Replace the multivalve
	Damaged Level sensor	Replace the level sensor according to instruction on page 32
	Float rod blocked inside the tank	Check the compatibility of the tank and the multivalve; Check if the float rod is conformed to original version and install the multivalve according to related instructions
	Float rod damaged or bent during installation	Check the correct 80% setting to an equipped service center. If the float rod is damaged replace the multivalve
	Plastic pipe overlapped on the float rod	Remove the multivalve from the tank, reposition the plastic pipe and assembly the multivalve according to related instructions
Lpg leak from the tank during refilling	Loosen fixing screws (of multivalve to tank)	Tighten up correctly the 6 fixing screws. Fixing torque should be 3÷4 Nm
	Loosen fitting on inlet pipe	Tighten up correctly the fitting. Fixing torque should be not over 5 Nm
	Filling device non-return valve blocked by dirt or impurities	Replace filling device
Lpg leak from the tank during normal work	Leak from pipe connection	Fix correctly the outlet fitting. The fixing torque should be 4÷5 Nm
	Wrong double conical and ferrule fixing torque	Fix correctly the outlet fitting. The fixing torque should be 4÷5 Nm according to instruction on page 23-25

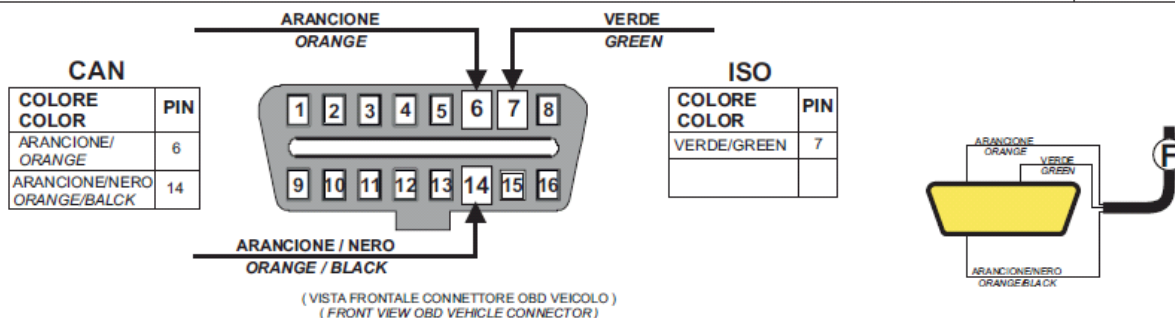
AUTOGAS
italia
www.autogasitalia.it

4 CYL



COLLEGAMENTO PRESA OBD
CONNECTION TO OBD PLUG

2 - A



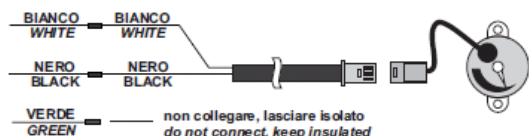
Se non si collega presa OBD la centralina gas lavora come normale centralina non OBD
If you not connect the ODB plug, the ECU works as a system not OBD

N.B. lasciare isolati i cavi in caso di mancanza del contatto nel connettore OBD veicolo
N.B. In case some contacts in the OBD connector are not present, keep the relevant cables insulated

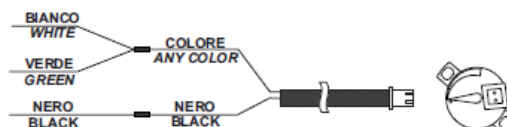
SCHEMI DI COLLEGAMENTO SENSORI DI LIVELLO
LEVEL SENSORS WIRING DIAGRAM

2 - B

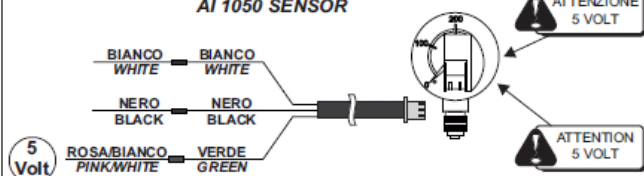
SENSORE LIVELLO GPL AI-300
AI-300 LPG LEVEL SENSOR



SENSORE LIVELLO 0..90 OHM
0..90 OHM LEVEL SENSOR



SENSORE AI 1050
AI 1050 SENSOR



COLLEGAMENTO SENSORE PRESSIONE
PRESSURE SENSOR INSTALLATION

