

## WHAT IS THE “SYSTEME BLOS”?

It is an extraordinary novelty in the field of LPG and CNG mixers for cars. “Système BLOS”, or simply “BLOS”, is patented worldwide.

BLOS is the result of several years of research and is manufactured with the most advanced technologies.

## WHY “BLOS” INSTEAD OF A TRADITIONAL MIXER?

**1** - A traditional mixer provided with a small inside diameter works well while idling and at slow speed, but it disadvantages the maximum performances of the engine. On the contrary BLOS behaves like a mixer having a great diameter, able to reduce the charge losses to a minimum, by leaving the engine breathe deeply.

**2** - A traditional mixer provided with a great inside diameter works well at high speed, but it gives rise to an unstable idling mixture, to gaps in accelerating, to flashback risks. BLOS gets round all these disadvantages to the user's great satisfaction.

**3** - BLOS allows a remarkable saving on fuel. Its excellent mixture complies with the most severe emission regulations.

**4** - It is necessary to install BLOS on any type of injection car fed both on LPG and on CNG.

**5** - BLOS simplifies the assembling operations: it can be installed between the bladed flow meter and the throttle body with no need of flow meters nor any pressure compensation. A single model covers the full range of vehicles.

**6** - BLOS is able to reduce all the flashback risks owing to a faulty mixture (it is plain that it would be never able to remedy a flashback caused by a defective sparking plug or by a leakage of current coming from the high voltage cables, or even by a use leading to the complete emptying of the LPG tank). The protection device of the flow meter  $\varnothing$  70F-70M code 90AV99010033 can be installed directly on the BLOS. On this purpose, file the metal flat band of the BLOS body ring nut contemplated for the air pipe coupling.



## CONSTRUCTION

Starting from the middle of '97:

- a working respecting the strictest tolerances,
- reinforced diaphragms, manufactured in a hydrocarbon-proof material,
- a redesigned cover allowing to work without rubbing the diaphragm,
- the gas pipe in stainless steel,
- the piston bronzed inside for a regular sliding and with no wear on the gas pipe,
- a quality control of M.T.M. S.r.l. (Quality Certification ISO 9001 obtained in '98) guarantees a reliable product both in its working and in its life.

The previous models (components and DEG 100 unit) must be reconditioned by the installer of the BRC network (use of the piston bronzed, stainless steel pipe, Eco-gas Junior unit) according to BRC instructions.

Furthermore, we have added on the BLOS body two bosses to be threaded for idling oil and air vapors (BRC union elbow M14X1).

## WORKING PRINCIPLES

BLOS is a variable orifice mixer, that is to say a mixer able to become large or small according to the engine requirements. So it is equivalent to a mixer having less than 10 mm of diameter in idling conditions and to a mixer having more than 45 mm of diameter when it is completely opened.

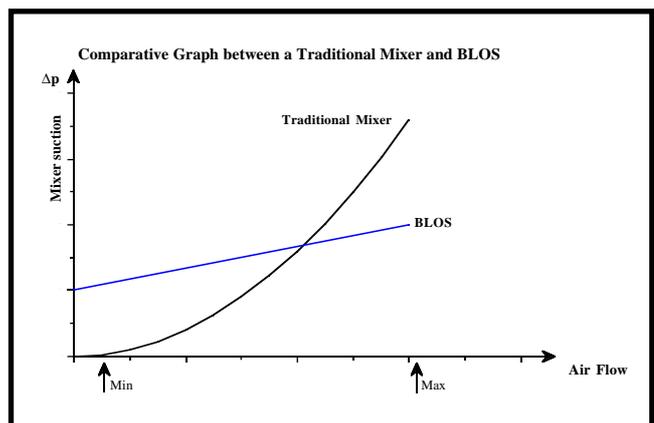
BLOS creates an almost constant suction in all the working conditions.

The graph on the side explains how a traditional mixer generates a very weak suction while idling (unstable mixture) and a very strong one at a high speed (cause of charge leakages and consequent limitation of the cylinder filling).

In idling conditions BLOS, instead, is able to produce a suction which is 20-50 times stronger on average, by guaranteeing an absolutely precise gas flow.

By observing the BLOS exploded view, we recognize the main body 6 where the piston 18 slides, guided by the pipe 8. The diaphragm 19 is fixed to the piston through the ring nut 20. The spring 22 constantly pushes the piston towards the bottom.

The air flow passing through the BLOS (in



the direction of the arrows) is subjected to a pressure drop. The pressure differential created propagates on the two sides of the diaphragm by provoking a resulting upward force that produces the piston opening till the balance position is reached.

It is possible therefore to consider that a well defined piston position corresponds to every air flow value.

Depending on its position, the piston then discovers a variable part of the slit situated along the pipe 8 and enables the gas to come out in proportion to the necessary flow.

**It is necessary to remark that:**

**a** - A single model of BLOS fits the full range of vehicles. The stainless steel gas feeding pipe is currently supplied with four types of slits:

Slit E: normal flow (80% of the vehicles)

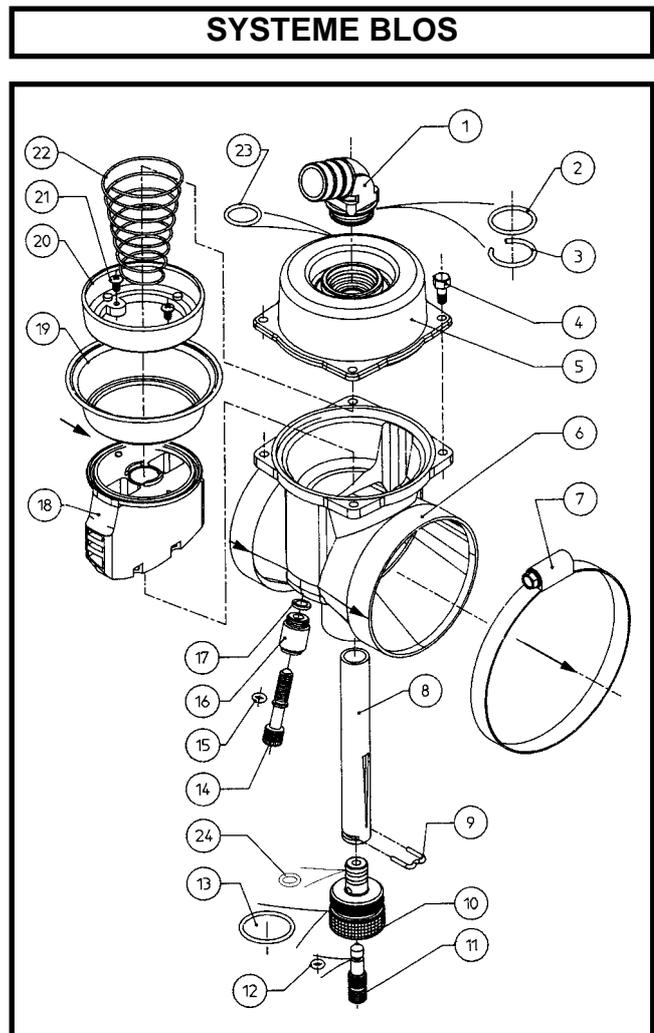
Slit D: increased flow (15% of the vehicles)

Slit A: much increased flow (5% of the vehicles)

Slit P: weak flow

**b** - The position of the slit can be adjusted thanks to the ring nut 10 which enables the pipe 8 to slide without turning thanks to the "M" piece 9. The ring nut 10 is the equivalent of the traditional adjusting screw.

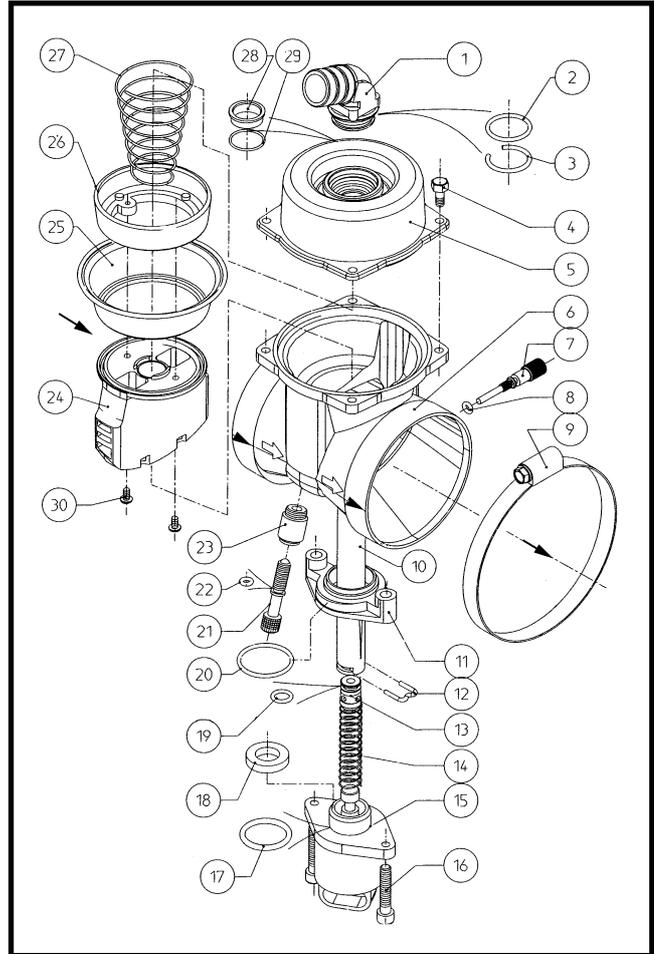
**c** - The screw 11 allows the idling mixture adjustment, enabling an additional gas flow to pass through the orifice which is on the bottom of the body 6.



**DESIGNATION**

1 GAS INLET ELBOW	14 EM. MANUAL DEVICE
2 OR2068 VITON	OPENING SCREW
3 COUPLING RING NUT	15 GAS RING OR2015 NBR
4 M4X10 TRILOBED SCREW	16 EM. MANUAL DEVICE
5 COVER	CYLINDER
6 MAIN BODY	17 ALUMINIUM WASHER
7 CLAMP SERFLEX 70-90 H9	14X10X1
8 BLOS STAINLESS PIPE RECT.	18 BLOS PISTON WITH COPPER
9 "M" PIECE	RING NUT
10 GAS FLOW ADJUSTING	19 BLOS DIAPHRAGM
RING NUT	20 DIAPHRAGM LOCKING RING
11 IDLING ADJUSTING SCREW	21 SELF-THREADING SCREW
12 GAS RING OR2012	22 SPRING
GREEN VITON	23 OR2050 GREEN VITON
13 OR3081 VITON	24 OR2025 GREEN VITON

## BLOS EVOLUTION



**DESIGNATION**

- |                                    |                             |
|------------------------------------|-----------------------------|
| 1 GAS INLET ELBOW                  | 16 T.C.E.I. M5X25 SCREW     |
| 2 OR2068 VITON                     | 17 OR3075                   |
| 3 COUPLING RING NUT                | 18 FELT FILTER              |
| 4 TE M4X10 TRILOBED SCREW          | 19 OR2025 GREEN VITON       |
| 5 COVER                            | 20 OR2081 GREEN VITON       |
| 6 MAIN BODY                        | 21 MAN. DEVICE OP. SCREW    |
| 7 IDLING ADJUSTING SCREW           | 22 OR2015 NBR               |
| 8 OR2012 GREEN VITON               | 23 MAN. DEVICE CYLINDER     |
| 9 CLAMP 70-90                      | 24 PISTON WITH RING NUT     |
| 10 BLOS STAINLESS PIPE RECT.       | 25 BLOS DIAPHRAGM           |
| 11 STEPPING ENGINE SUPPORT BRACKET | 26 DIAPHRAGM LOCK. RING NUT |
| 12 "M" PIECE                       | 27 CONICAL SPRING           |
| 13 PAWL                            | 28 ROT. SHAFT RING NUT      |
| 14 STEPPING ENGINE SPRING          | 29 OR15X1 NBR               |
| 15 STEPPING ENGINE WITH TONGUE     | 30 SELF-THREAD.SCREW        |

## BLOS ASSEMBLY

BLOS has been devised to be installed on injection cars but, thanks to the small vacuum opening piston, it also fits the carburettor ones.

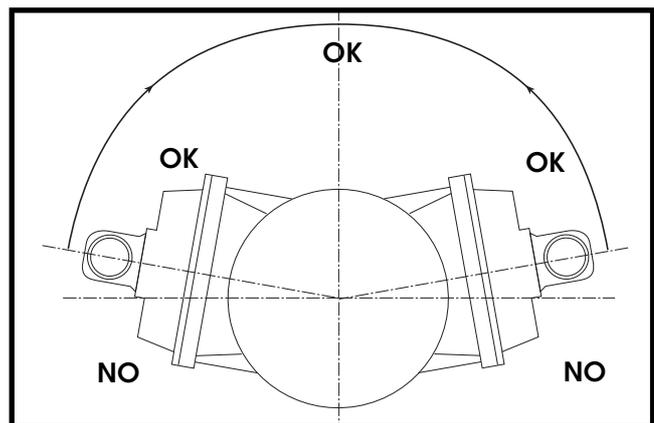
On the vehicles provided with a flow meter, BLOS is installed between the flow meter and the throttle body. On the vehicles unprovided with a flow meter, it is installed between the air filter and the throttle body.

The arrows must be turned towards the throttle body. It is furthermore necessary to check that the pipe slit and the 2 piston holes are well turned towards the engine.

The pipe carrying gas from the reducer to the BLOS must be jointed to the elbow 1 and remain soft not to produce tension on this brass pipe fitting. Do not lengthen this pipe pointlessly.

On some cars it is possible to cut easily the original pipe coupling in order to create the housing for the BLOS.

In other cases, it will be possible to use several types of pipe couplings supplied by BRC, both straight and elbow (60x70 or 70x70 or 80x70). As per the above photo, it is advisable to fix the BRC flow meter protection 70x70 code 90AV99010033 directly on the Blos (engine side).



## IMPORTANT REMARK

A correct clamping shall guarantee the tightness of these installations, in particular between the BLOS and the gas feeding pipe.

It is better to instal the BLOS with the feeding elbow turned upwards and with the stepping engine (if any) down below, or inclined above the horizontal plane as per the layout.

The position contemplating the elbow downwards is to be avoided.

The BLOS cover is sealed and must not be dismantled, to remain under warranty (an incorrect assembly could generate rubbing which would prejudice the good working).

## THE PIPES

The stainless steel pipes are provided with four types of slits allowing to fit the different vehicles:

Slit E: normal flow

Slit D: increased flow

Slit A: much increased flow

Slit P: weak flow

BLOS is currently provided with a slit D.

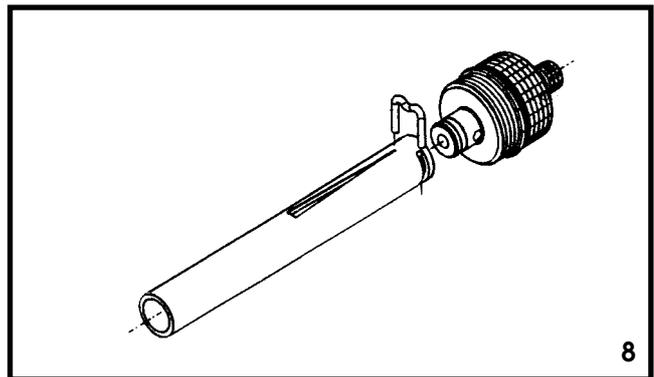
## REPLACEMENT OF THE PIPE

Unscrew the ring nut 10, making sure not to let the "M" piece fall.

Remove the "M" piece.

Replace the pipe 8 with another one having the slit chosen.  
Remount the "M" piece from the slit side!!  
(see the drawing)

Remount the pieces on the body by observing that the "M" piece re-enters its housing. It is necessary to introduce it in the right direction, to push to the bottom and to screw of approximately a turn.



## ADJUSTMENT

### **Reducer adjustment**

The idling adjusting screw of the BRC reducer shall be screwed to the bottom and the "sensitivity" adjusting screw shall maintain its original setting, with the only exception of the carburettor vehicles and cars starting up directly on gas.

### **Non catalytic cars adjustment**

Adjust the ring nut 10 towards the middle of its stroke (screw to the bottom and unscrew 2 turns and more if necessary) (fig. 10).

Adjust the idling screw (screw to the bottom and unscrew a turn and a half) (fig. 11).

Start the engine and change over to gas. By using an exhaust gas analyser, let the engine run at 3500 rpm and look for the adjustment allowing to get the maximum CO<sub>2</sub> and the minimum CO in the same time.

Adjust carefully the ring nut 10 exactly like a traditional adjusting screw (the more you unscrew, the more you supply gas). In any case, a shift of  $\pm 2$  mm of the pipe (2 turns of the ring nut 10) greatly changes the mixture richness.

Adjust the CO - CO<sub>2</sub> while idling through the idling screw (11) and check again at 3500 rpm whether it is correct.

The Set 2000 shall be very useful, in particular the early times, to gain experience.

The car, once it is adjusted properly, shall run up to 100-110 km/h with a slightly lean mixture (constant speed) but the mixture shall be quickly enriched while you step completely on the accelerator. Gas mustn't fail at the highest speeds.

Improve the idling adjustment by acting on the screw 11.

To be certain, repeat the complete operation at least twice.

### **Catalytic cars adjustment**

The BLOS Evolution system is a completion of the standard BLOS manufactured for the catalytic cars.

The BLOS Evolution system with the Eco-gas Junior or Ecogas ECU and with the Fox reducer is an approved unit for the LPG feeding of the catalytic cars.

It has positively overcome the most severe tests on emissions (CO, HC, NO<sub>x</sub>) and is in accordance with the European Direction 96/69.

It consists of the variable orifice BLOS



mixer improved thanks to the gas pipe motorization through a stepping engine adapted on the basis of the BLOS. The signals sent out by the Lambda oxygen sensor are analysed by the Ecogas Junior or Ecogas ECU which, through the stepping engine, controls the gas pipe rise or descent, then the mixture leaning out or enrichment. The carburation has permanently and automatically an optimum mixture.

A correct installation of the BLOS Evolution and the adjustment according to the instruction manual of the Ecogas Junior with BLOS allow a very satisfying working.

After a first check at 1000 kms, it is advisable to overhaul it every 20.000 kms (spark plugs, filters, as per the provisions of the BRC scheduled maintenance handbook).

## **MAINTENANCE**

- When you service the equipment at 20.000 kms, check the piston sliding on the pipe. If necessary, vaporize exclusively unlocking products on the pipe (avoid any product which could damage the diaphragm) and let the piston slide to obtain a good working.

## **IMPORTANT NOTICE**

In case of excessive dirt, dismount the pieces to clean them.

- Also check the state of the BRC flow meter protection and of its blade.

