

# ***TECHNICAL TRAINING***

SALES DIVISION



## **SINGLE PISTON CARBURETTOR**

## CONTENTS

<b>CARBURETTOR .....</b>	<b>3</b>
Function .....	3
Basic principle .....	3
<b>GURTNER CARBURETTOR (moped) .....</b>	<b>4</b>
<b>THROTTLE DISC .....</b>	<b>4</b>
<b>GURTNER D12G CARBURETTOR (moped) .....</b>	<b>5</b>
<b>GURTNER GA14 CARBURETTOR (moped) .....</b>	<b>6</b>
<b>GURTNER CARBURETTOR (scooter) .....</b>	<b>7</b>
description .....	7
<b>FUEL CIRCUITS .....</b>	<b>8</b>
Main circuit (Mixture circuit) .....	8
Independent circuits .....	8
<b>IDLE CIRCUIT .....</b>	<b>9</b>
<b>MAIN CIRCUIT .....</b>	<b>10</b>
<b>CHOKE CIRCUIT .....</b>	<b>11</b>
Cold .....	11
Hot .....	12
<b>OTHER CIRCUITS .....</b>	<b>13</b>
<b>GURTNER CARBURETTOR .....</b>	<b>14</b>
<b>DELL'ORTO CARBURETTOR .....</b>	<b>15</b>
<b>CARBURETTOR SETTINGS .....</b>	<b>16</b>
Effect of the carburettor components on its operation .....	16
Mixture setting .....	16
Setting .....	16

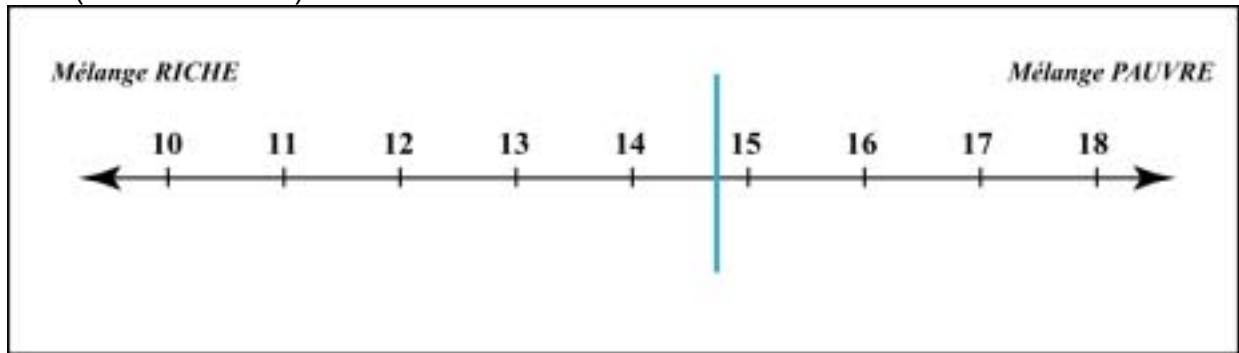
# CARBURETTOR

## CARBURETTOR

### Function

The function of the carburettor is two-fold, it has to:

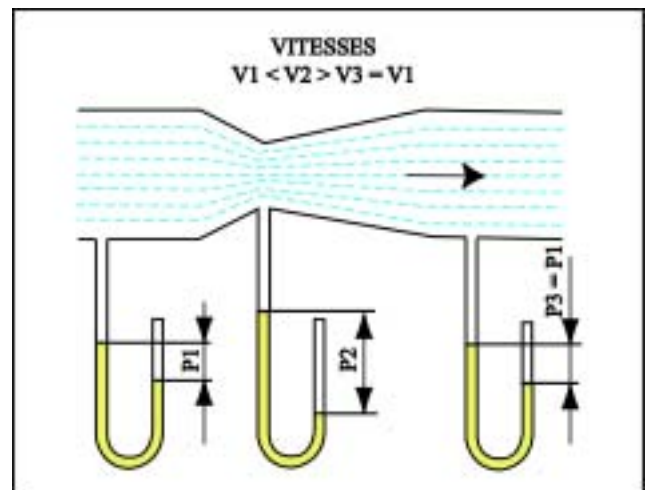
- provide the engine with the fuel/air mixture in a proportion as close as possible to the ideal which is 14.7 gr of air for 1 gr of fuel (stoichiometric ratio)



- Enable the rider to control the quantity of air/fuel fed to the engine, in order to adapt the engine load to the instantaneous requirements

### Basic principle

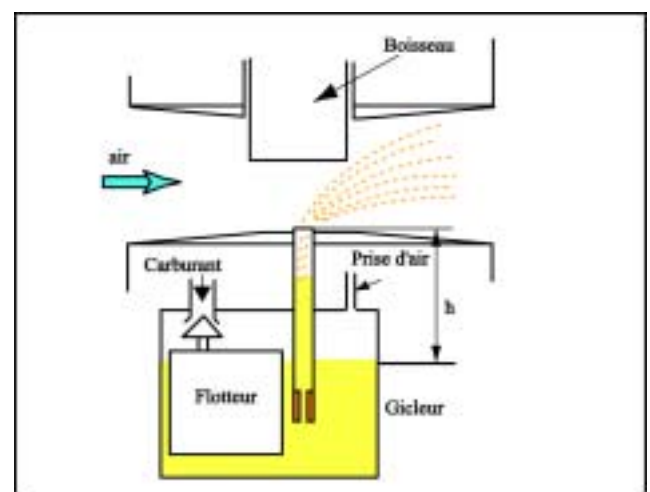
Venturi principle: the speed of the gases increases at the smaller cross-section in a tube whereas pressure decreases



Function : To feed the engine with a homogeneous mixture of air and fuel

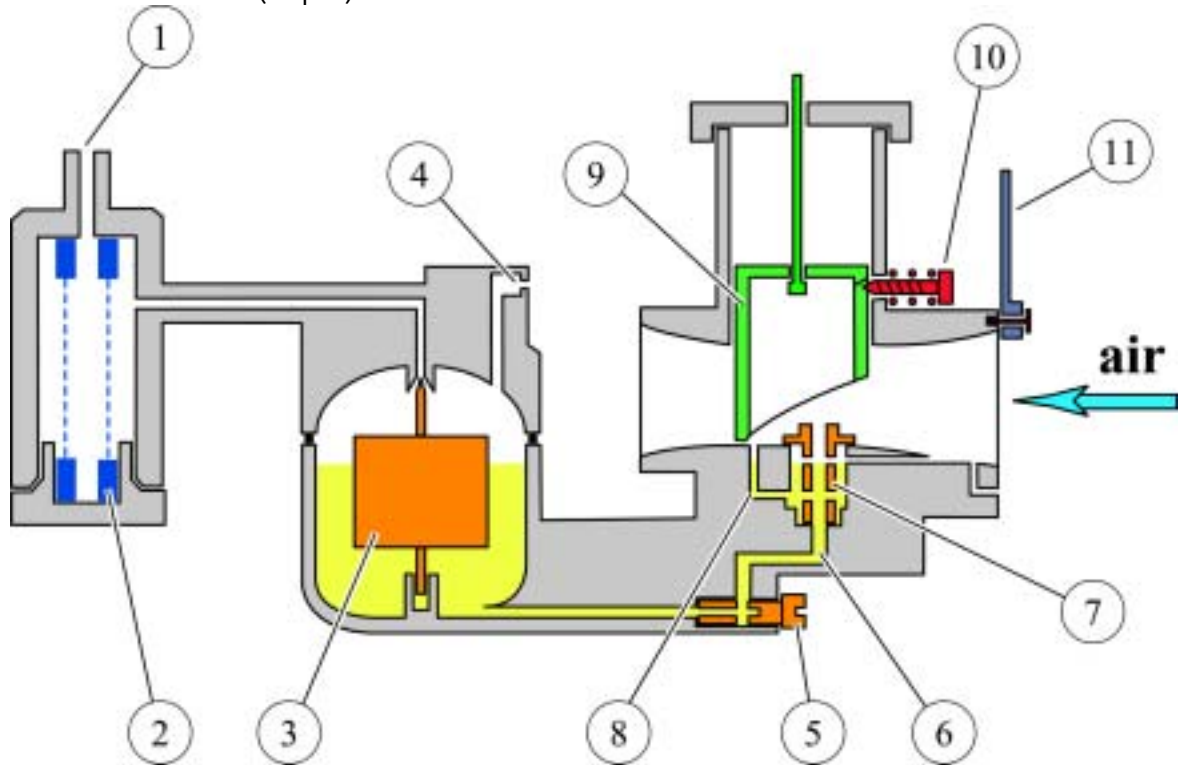
Operating principle : the fuel needs to evaporate quickly in order to reach the cylinder in gas form  
To do so, the carburettor uses the speed of the air stream aspirated by the engine in order to generate sufficient vacuum to suck in the fuel and then vaporise it

This vacuum is obtained due to the special shape of the conduit called the VENTURI



# GURTNER CARBURETTOR (moped)

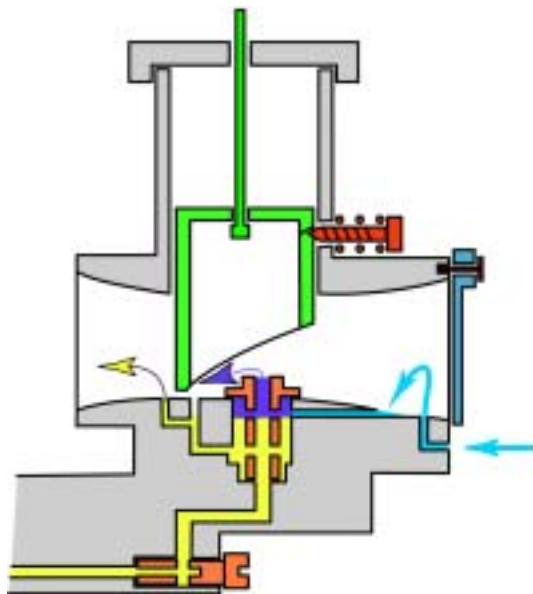
## GURTNER CARBURETTOR (moped)



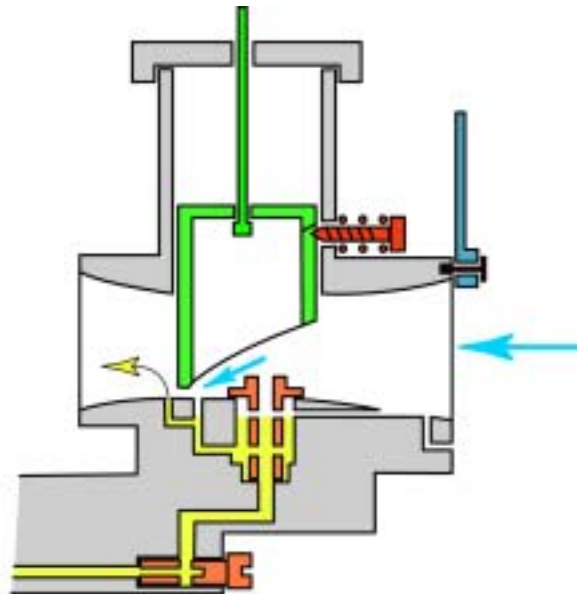
- 1 - Fuel supply
- 2 - Fuel filter
- 3 - Float
- 4 - Breather
- 5 - Main jet
- 6 - Main circuit

- 7 - Emulsion pipe
- 8 - Idle system
- 9 - Piston assembly
- 10 - Idle screw
- 11 - Throttle disc

## THROTTLE DISC



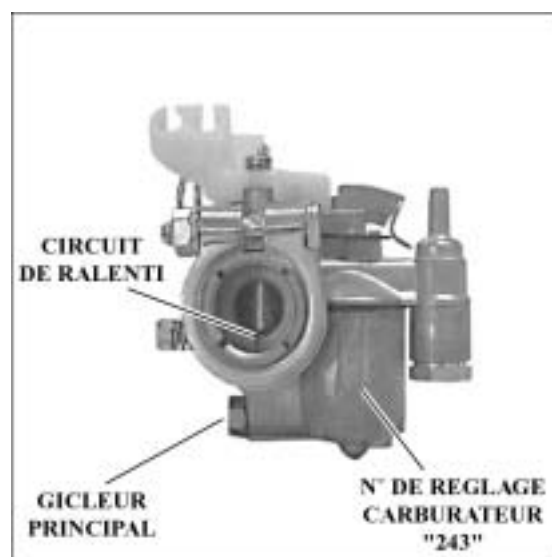
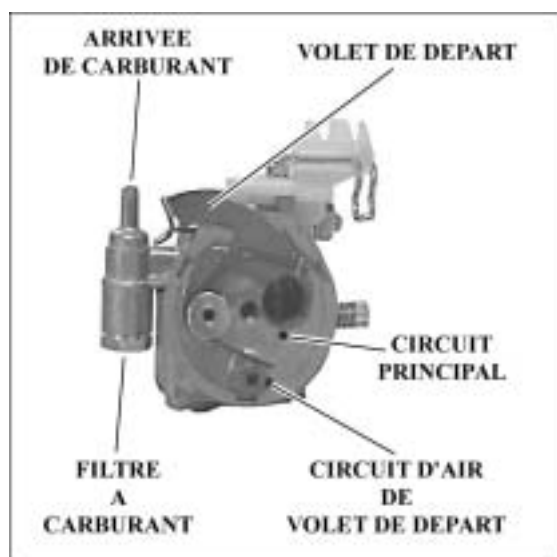
Engine COLD



Engine HOT

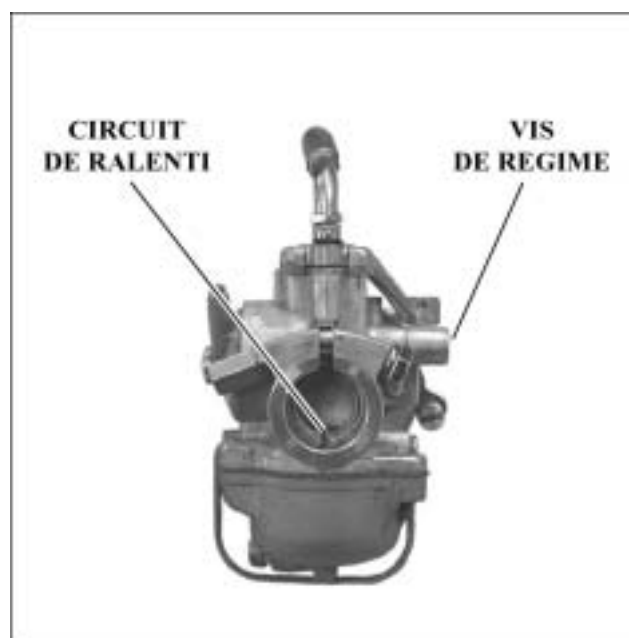
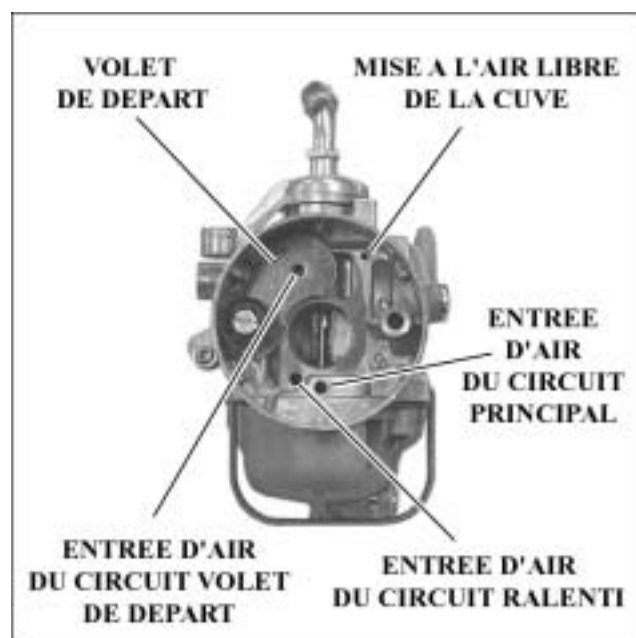
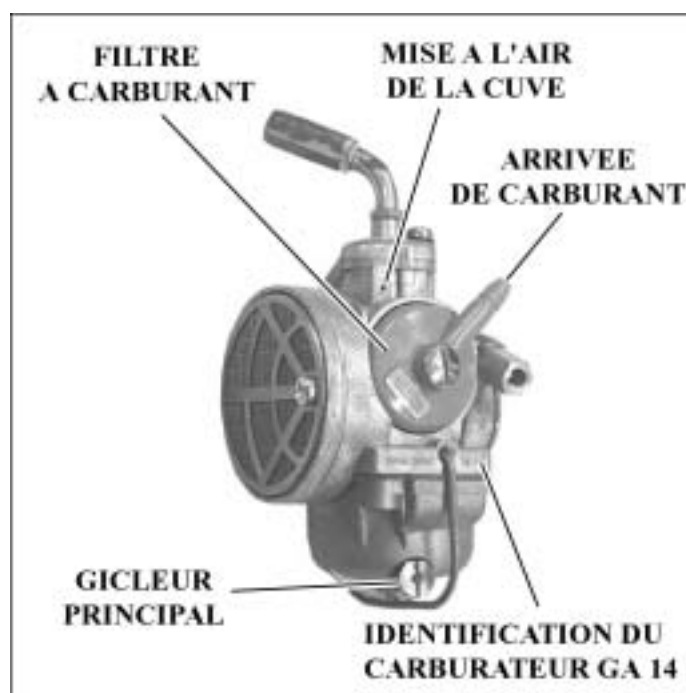
## GURTNER D12G CARBURETTOR (moped)

### GURTNER D12G CARBURETTOR (moped)



## GURTNER GA14 CARBURETTOR (moped)

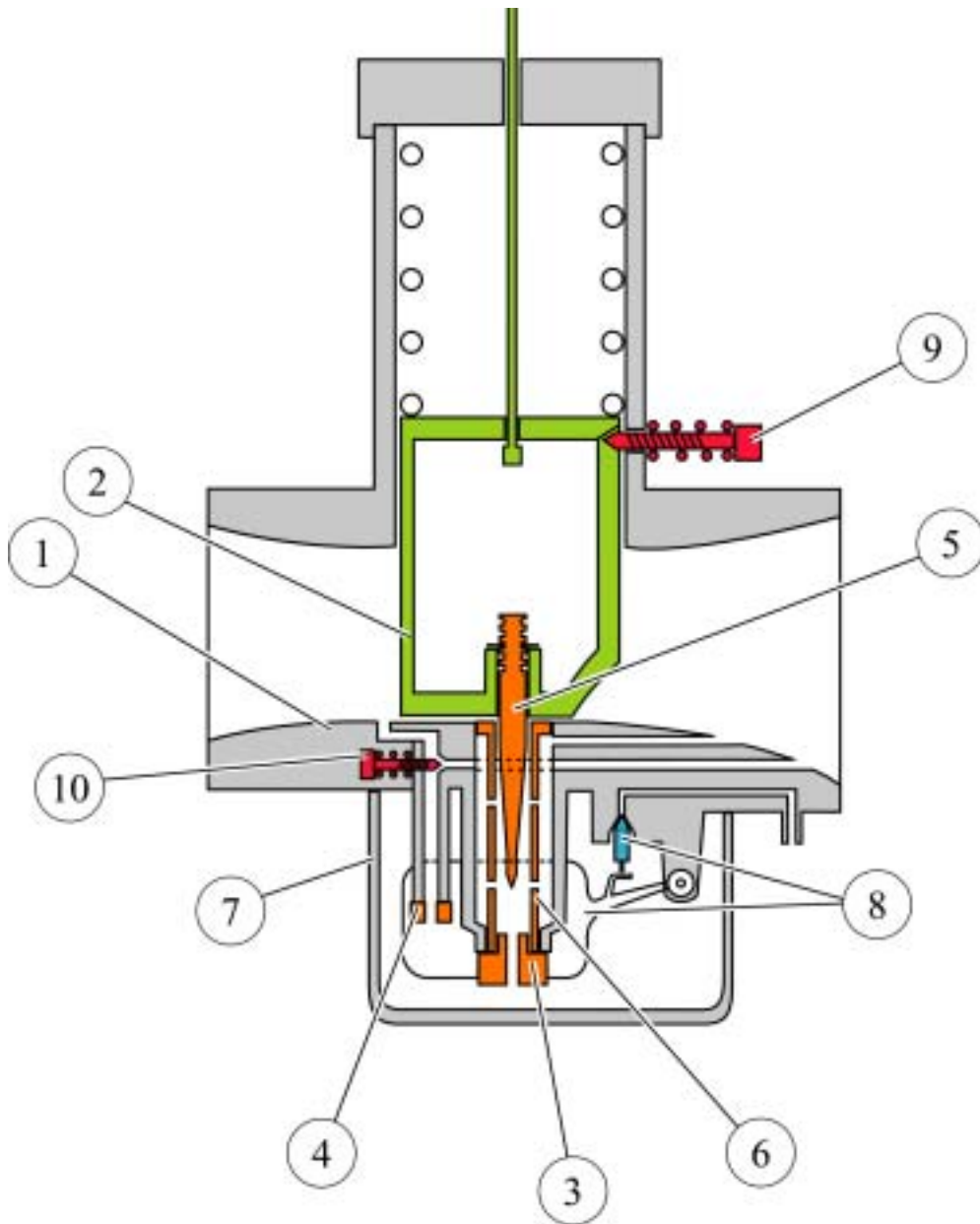
### GURTNER GA14 CARBURETTOR (moped)



## GURTNER CARBURETTOR (scooter)

### GURTNER CARBURETTOR (scooter)

#### description



- 1 - VENTURI : carburettor main air intake jet, directs air into the carburettor
- 2 - PISTON : controlled from the throttle twist-grip, opens or closes the venturi
- 3 - MAIN JET : sets the initial fuel flow in the main circuit
- 4 - IDLE JET : calibrates the initial fuel flow in the main circuit
- 5 - NEEDLE : located under the piston, it gradually opens or closes the needle chamber. Its taper and differing diameters determine the quantity of fuel injected into the venturi on the basis of the piston opening
- 6 - NEEDLE WELL : regulates the fuel flow
- 7 - FLOAT CHAMBER : partly filled with fuel, contains the float and the jets
- 8 - FLOAT and NEEDLE : determine the fuel level in the chamber
- 9 - IDLE SCREW : adjusts the idle speed using the piston position
- 10 - MIXTURE SETSCREW : used to adjust the idle circuit air/petrol mixture

## FUEL CIRCUITS

### FUEL CIRCUITS

#### Main circuit (Mixture circuit)

Designed to provide the most homogeneous mixture possible as the needle moves

#### Independent circuits

There are two circuits parallel and separate from the main circuit

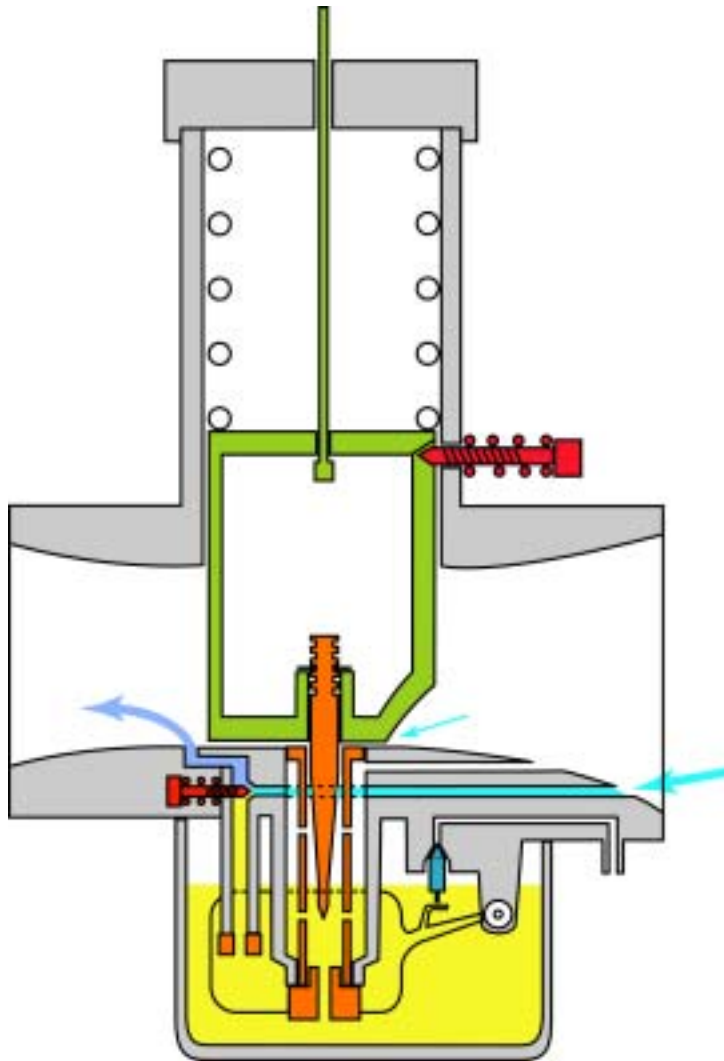
1 - Idle circuit : this is an independent circuit which functions especially when the piston and needle are at rest. The fuel circuit flow is controlled by the air screw (mixture screw)

2 - Choke circuit : this is also a separate circuit which is used to enrich the gas phase mixture for starting and running the engine when cold



## IDLE CIRCUIT

### IDLE CIRCUIT



When the piston is against the idle screw, the air flow is insufficient to prime the main circuit.

A secondary circuit is set up composed of a small jet which facilitates vaporisation of the fuel and of a conduit running through the carburettor body which aspirates the air upstream of the piston and exits downstream of the piston

In order to adjust the richness of the mixture supplied by the idle circuit, an air setscrew is used to adjust the air inlet :

TIGHTEN = RICHER

SLACKEN = POORER

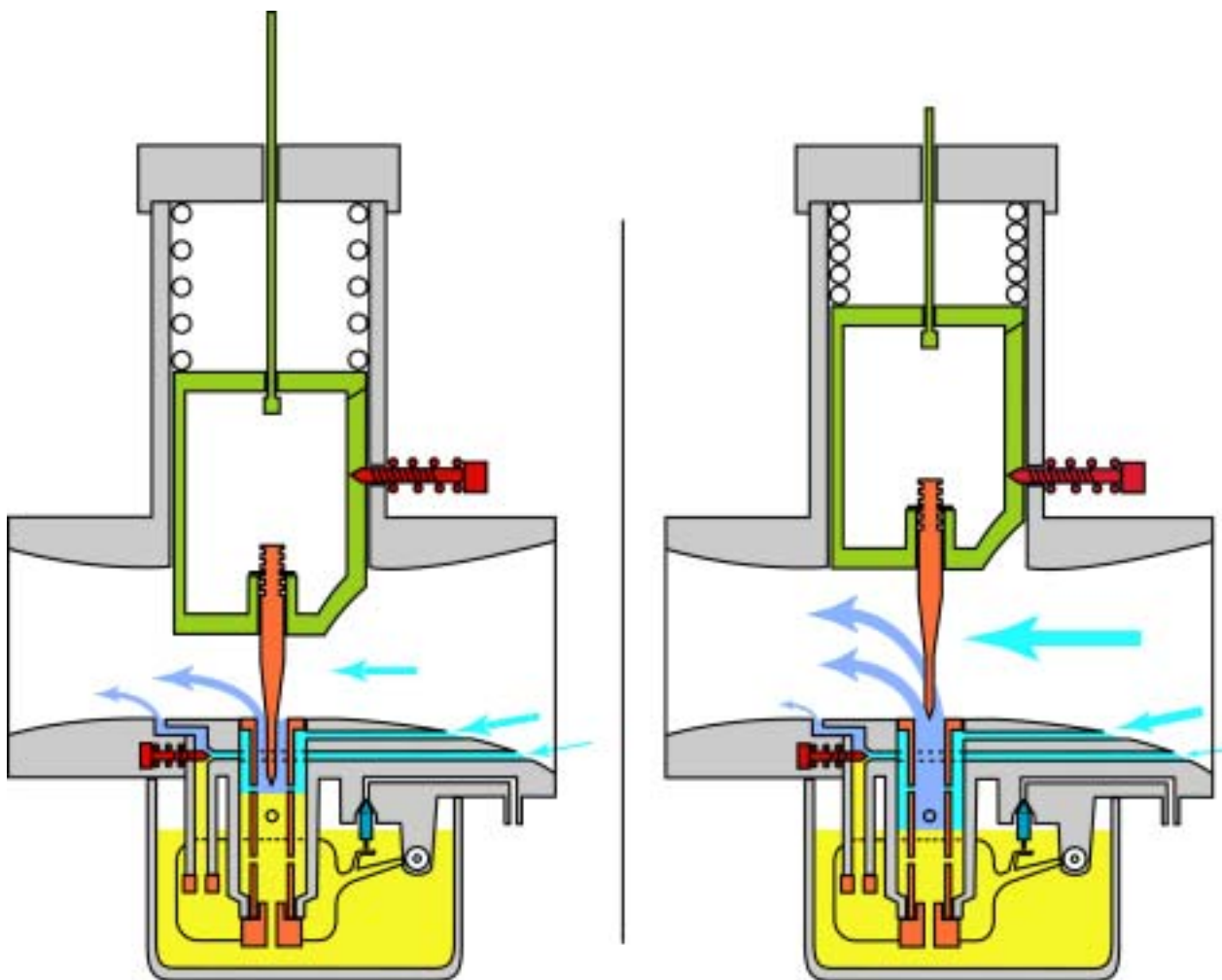
The circuit enables the transition between idle and beginning of acceleration

Note :

The cut-out in the piston on the air intake side determines the quantity of air admitted for piston small openings

## MAIN CIRCUIT

### MAIN CIRCUIT

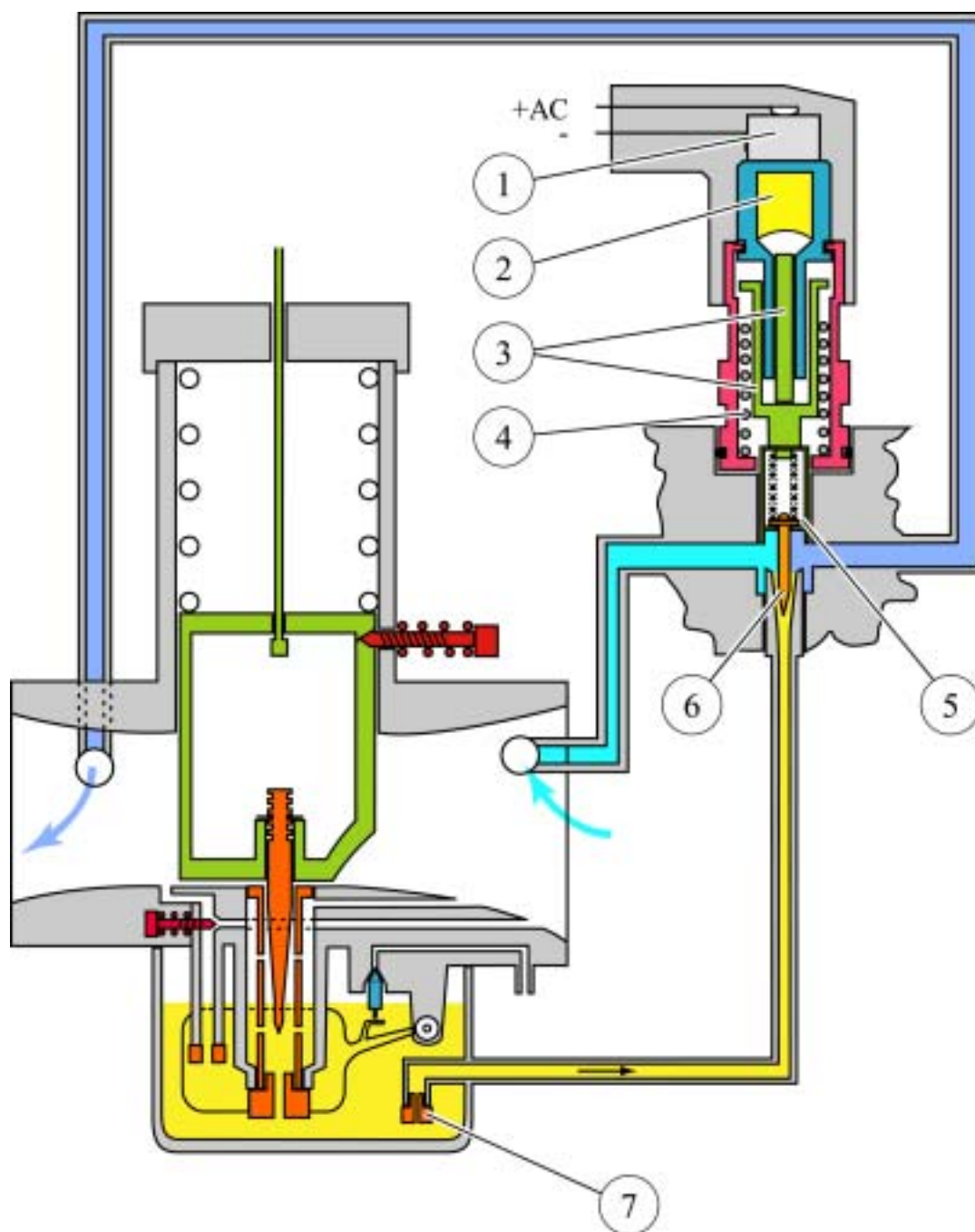


This circuit gives the most homogeneous mixture possible when the needle travels upwards in its well  
In effect, the more the piston opens, the easier the fuel flows through (richer mixture) ; inversely, as the needle starts to lift, it is difficult to prime the circuit (poorer mixture)  
This two-fold problem is solved by air intake into the needle well :  
At low revs, the air intake facilitates the fuel mixture  
At high revs, the air limits rising of the fuel up the needle well

## CHOKE CIRCUITS

### CHOKE CIRCUIT

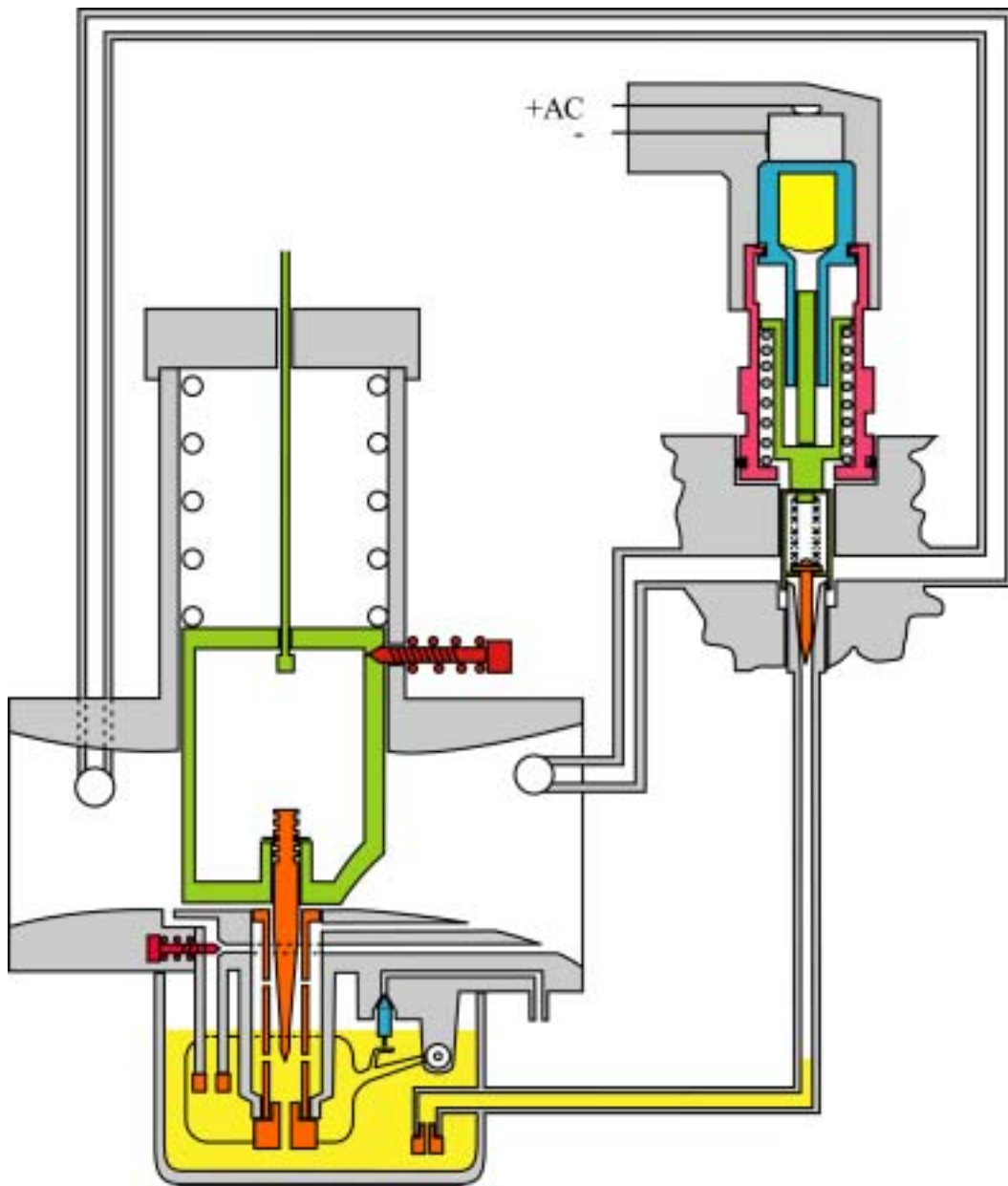
Cold



- 1 - Heater element
- 2 - Expanding wax
- 3 - Pressure pistons
- 4 - Return spring
- 5 - Piston
- 6 - Needle

## CHOKE CIRCUIT

Hot



The enrichment device, usually called the **CHOKE** is designed to give a richer air/petrol mixture under certain conditions, particularly at low temperature the speed of the air flow through the inlet device is insufficient to obtain proper fuel vaporisation.

This results in condensation of the fuel on the insides of the inlet conduit.

Engine COLD : The Choke circuit cuts in automatically, the fuel aspirated into the carburettor chamber by the Choke jet is vaporised downstream of the piston.

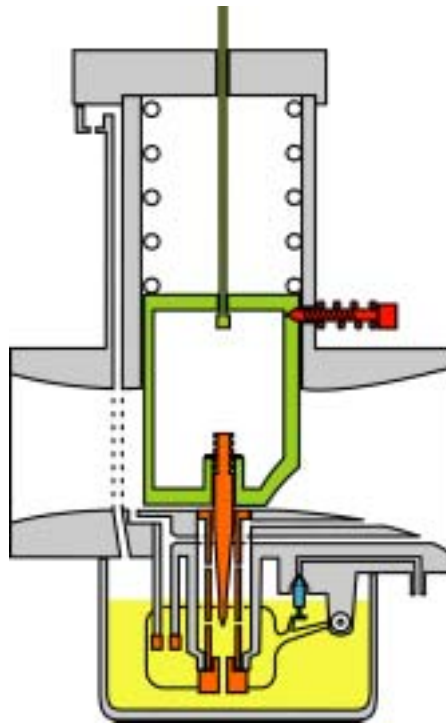
Engine HOT : The magneto flywheel powers the choke element, the increase in temperature expands a wax capsule. The expansion pushes down:

- the needle (closing the fuel circuit)
- the piston (closing the air circuit)

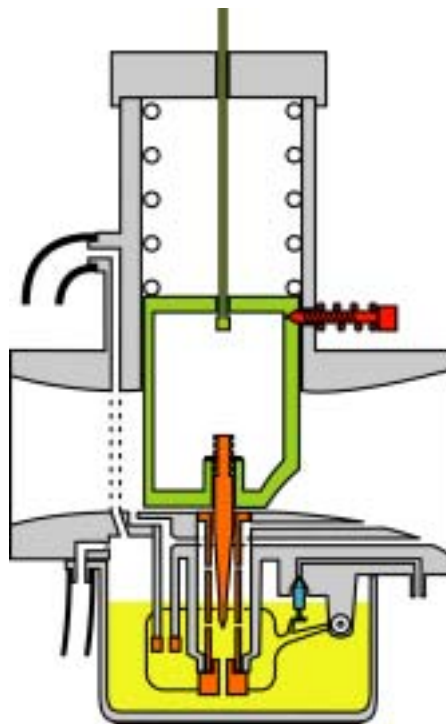
## OTHER CIRCUITS

### OTHER CIRCUITS

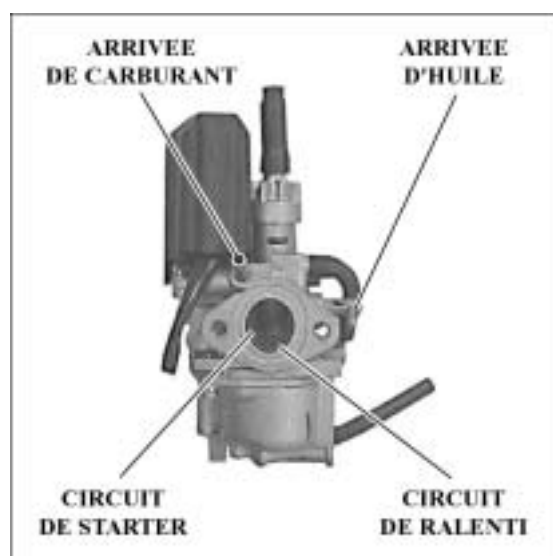
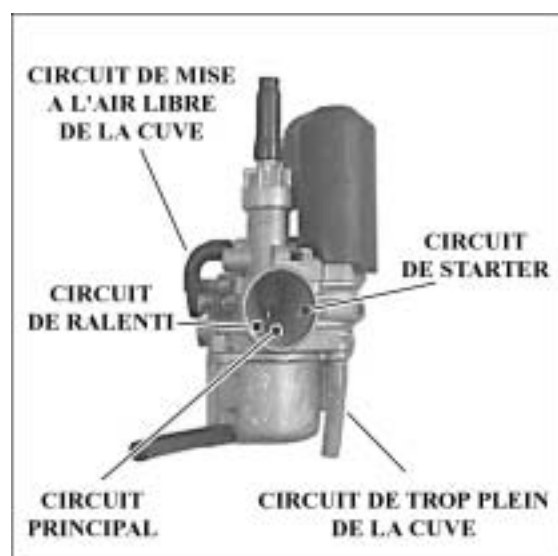
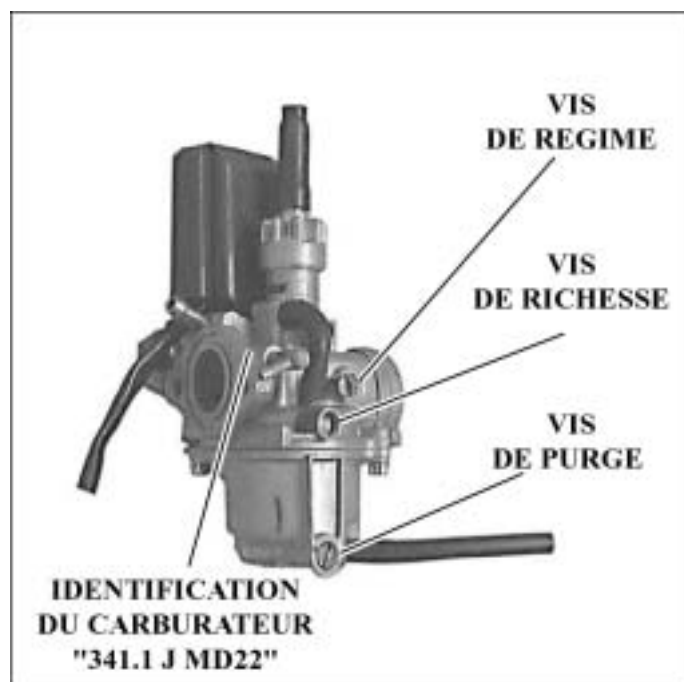
#### Carburettor chamber air vent circuit (DELL'ORTO)



#### Carburettor chamber vent and overflow circuits (GURTNER)

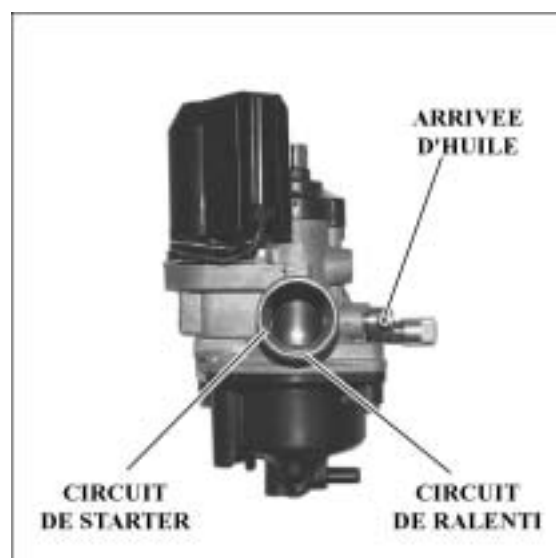
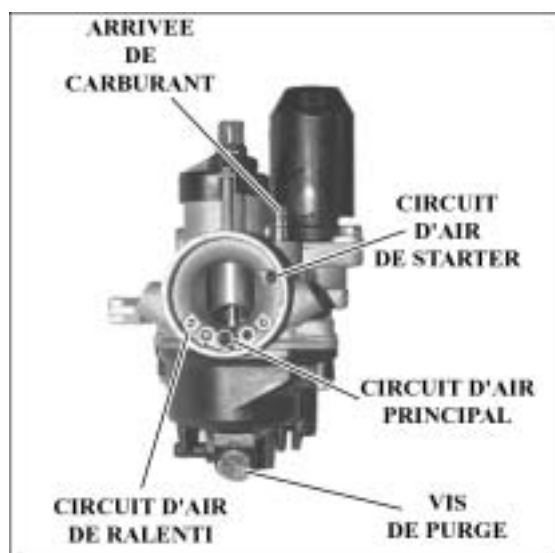
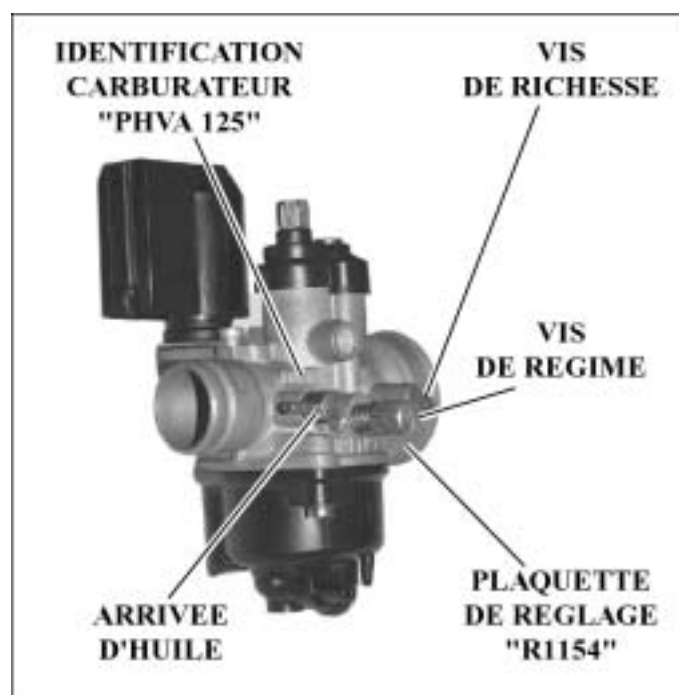


## GURTNER CARBURETTOR



## DELL'ORTO CARBURETTOR (scooter)

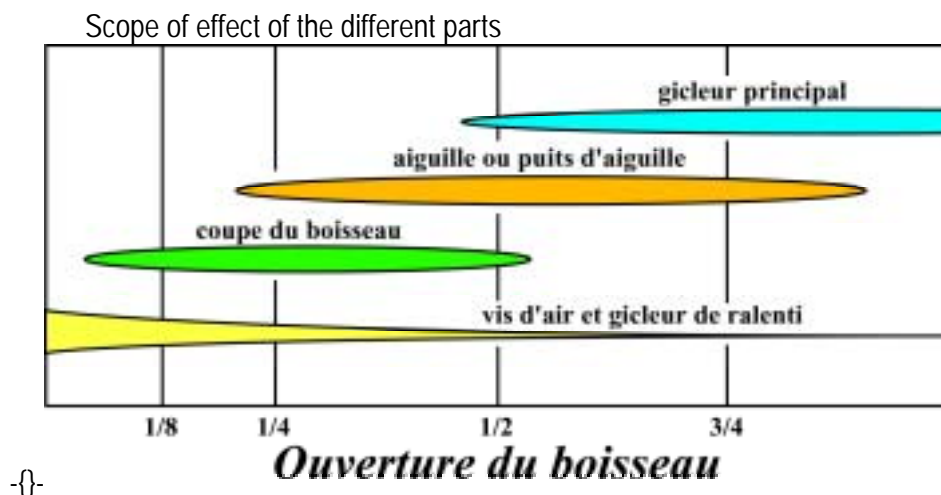
### DELL'ORTO CARBURETTOR



## CARBURETTOR SETTINGS

### CARBURETTOR SETTINGS

#### Effect of the carburettor components on its operation



#### Mixture setting

Before setting the carburettor, check:

- the engine is running correctly (ignition, air filter, exhaust, etc.)
- the quality of the fuel
- the carburettor is clean and the configuration of the jets, needle, etc. is correct (see TECHNICAL DATA)

#### Setting

- Set the idle speed to 1600 rpm
- Slacken or tighten, as required, the mixture screw by 1/8 of a turn and find the position giving the highest engine speed.
- Set the idle speed to 1600 rpm
- Carry out a road test with the machine
- Slacken or tighten, as required, the mixture screw by 1/8 of a turn and find the position giving the highest engine speed.
- Set the idle speed to 1600 rpm

Note: Never slacken the mixture screw by more than 2 turns MAXIMUM (if more than 2 turns, check the air intake or the carburettor for wear)