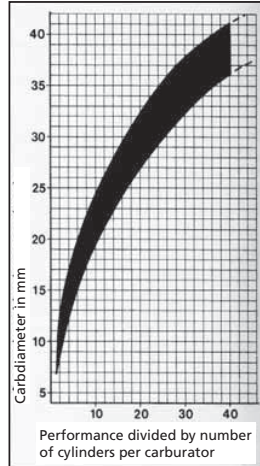


# Carburetor technic

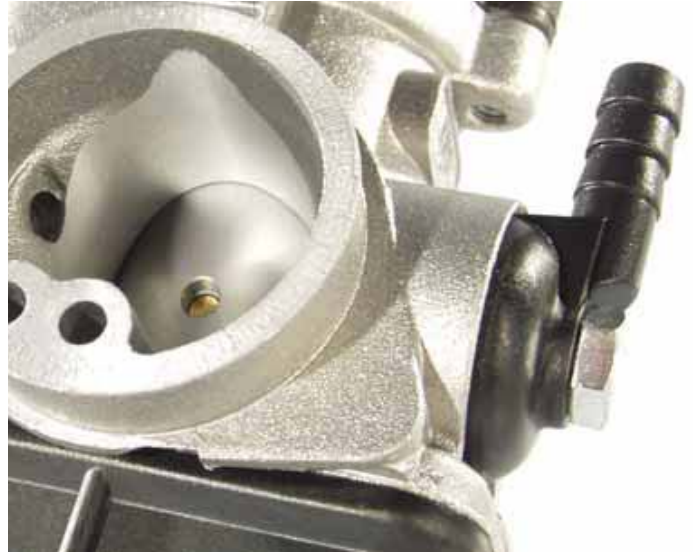
## 1. HOW A CARBURETOR FUNCTIONS

A carburetor supplies the cylinder with a mixture of fuel and air, which is brought to explosion, which in turn, releases energy. A wide pallet of tuning combinations is available for every scooter, making each engine and it's tuning highly individual. Carburetor tuning is an essential task of every scooter afficianado. Only through correct carburetor adjustment can you get maximum performance from your scooter.

## 2. CHOOSING CARBURETOR SIZE



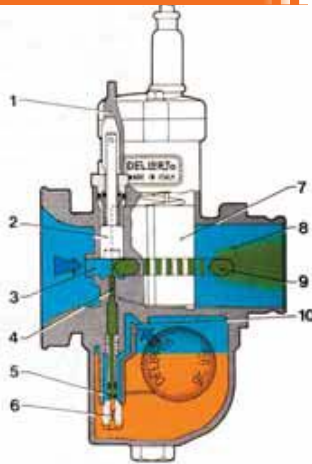
The most important aspect of a carburetor is it's size. The value of the carburetor size is based on the diameter of the induction port (for example, PHBG 19 = 19mm induction port diameter). Depending on how much the motor had been modified, a larger induction diameter guarantees a real power increase in higher rpm's, while a smaller carburetor diameter results in better acceleration.  
**Attention:** a larger carburetor needs a larger main jet. Rule of thumb: the main jet should increase 10% for every millimeter enlargement of the induction diameter.



## 3. COLD START ALIAS „CHOKE“

Getting your scooter to start at low temperatures can be difficult due to poorly atomized fuel or fuel condensation. You'll need either a manual or electric choke to get your carburetor the right air-fuel mix.

Your carburetor can get more fuel by installing a larger choke jet, getting your better starts in cold weather. Ideal for hard liners down to minus 30° or for that tour you're planning to the North Pole



- 1 Choke lever
- 2 Choke
- 3 Air induction
- 4 Choke channel
- 5 Starter air jet bore
- 6 Choke jet
- 7 Gas slide valve
- 8 Intake duct
- 9 Secondary channel
- 10 Fuel channel

## 4. Carburetor Tuning

Before you start tuning your carburetor, make sure all installed parts remain the same. A change of air filter, cylinder, exhaust or ignition means renewed carburetor tuning.

- When tuning your carburetor, make sure to adjust the main jet in the full throttle mode of the **full load system**. Fuel flows through the main jet via the mix tube and needle into the induction channel; the main jet pre-ports fuel amount.
- Then adjust the secondary jet in **idle range**.
- Now, adjust the jet needle and venturi in **partial load range**.
- Last, adjust **idle range** using adjustable screw.

Basics: if moderate tuning is your aim, then main jet adjustment will suffice. If you want more tuning, you'll have to adjust idle ranges and partial load ranges.

## 5. FULL LOAD SYSTEM

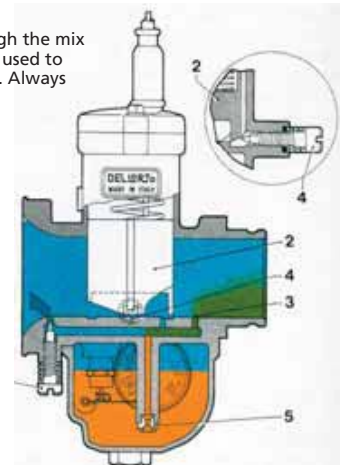
**5.1 The Main Jet** To find the right main jet, start with a large jet and move down number by number till you find the right size. If you pull the choke at full gas (fatter mix) and this leads to poorer output or lower rpm's, then your jet should be a smaller number. Smut buildup in exhaust opening, darkened exhaust, burned spark plugs or improved motor performance with partially closed fuel tap are other signs of a too large main jet.  
 Your main jet is too small when your motor runs better when the choke is pulled. Your spark plugs will usually look white and you motor will ping. In this case, simply increase the jet size till you find the right one. To judge if you have the right size, your motor should run smoothly when at full throttle and your spark plugs should be brown in color.

## 6. IDLE RANGE

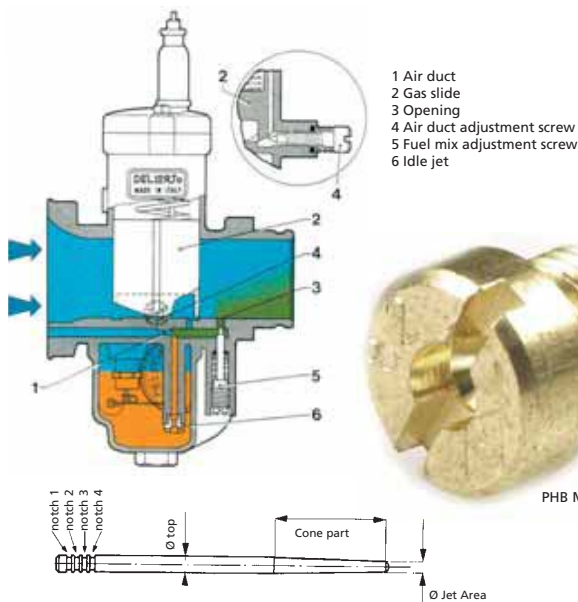
When idling, the motor needs a different mix with less air for lower rpm's. When the throttle is almost closed there is a small low pressure area in the upper range of the throttle, which is not enough to activate fuel flow to circulate in the main jet. Instead, an increased vacuum in the lower part of the throttle activates circulation in the idle jet. This circulation can be regulated through the idle jet, the fuel mix or the air adjustment screw.

**6.1 The idle range jet.** To determine jet size here, open the throttle slowly to about 10% (of the total). This should raise the rpm's smoothly. When the rpm's first fall and then return to normal, then you jet is too small. If your motor sounds as though the choke is pulled (stutters), then your jet is too large. This can be caused by a too widely opened mix adjustment screw or a too widely opened air adjustment screw. The larger the idle range jet, the fatter the mix.

**6.2 Mix adjustment screw.** The mix flow is regulated through the mix adjustment screw, which can be used to increase or reduce your idle mix. Always make adjustments when your motor is warm. >>



- 1 Air adjustment screw
- 2 Gas slide valve
- 3 Opening
- 4 Mix adjustment screw
- 5 Idle jet



>> First, turn the mixture jet screw out 4-5 turns. The motor will run too fat and will probably die. Now, with the motor running, slowly turn the mixture screw back, which will raise idle somewhat. Continue to screw in further until idle reaches the highest point, then turn back one quarter of a turn. Now, readjust idle using the idle adjustment screw. That's all there is to it!

**6.3 Air adjustment** The air adjustment screw controls the amount of air to the fuel mix - which also controls the idle mix. Turning the screw closed creates a fatter mix, turning the screw out gives a leaner mix. This adjustment, as all adjustments, should be made when the motor is warm: screw air adjustment screw until closed, then a half turn out. Your motor will run too fat and will probably quit. Now adjust the idle. Turn the air adjustment screw slowly out with the motor running. Idle rpm's will increase by itself. Turn the screw out until the rpm's are highest, now turn back a quarter turn. Now adjust the idle rpm's and you've got it!

If you take a look at the carburetor from the side, you'll see the position of the gas slide valve. The mix adjustment screw is located (from the gas slide valve) staggered towards the manifold, the air adjustment screw is staggered in the direction of the air filter.

## 7. PARTIAL LOAD

Partial load or half gas can be reached when the gas slide valve is 1/4 to 3/4 open. Jet needles and mix tube are responsible for regulating the mix in this area.

**7.1 Needles** The needle can be adjusted with a clip in 4 different positions. If the motor runs fine with completely opened gas slide valve, but stutters at half, then it's running too fat. You can hang the jet needle lower (move the clip higher up the needle) and so reduce the mix in this area. If the needle is already at it's lowest position and the mix is still too fat, then use either a thicker needle or a smaller mix tube. If your performance is too low at full gas then hang the needle higher. Needles come in a variety of thicknesses, lengths and grades. We recommend trying out several needle sizes to find which one is best for your personal tuning needs.

**7.2 Venturi Tubes** Together with the jet needle, the venturi tube is responsible for partial load adjustment. If the adjustment is too fat (motor stutters and throttles) and the jet needle already is in the lowest slot, then it's time for a small venturi tube. The rule applies here as well: the higher the number, the fatter the venturi tube. In the partial load range with a barely opened gas slide valve your motor should purr not stutter. If it doesn't get hiccups when gas is turned up, then you've got it right.

## 8. AIR PRESSURE AND TEMPERATURE CHANGES

The fuel mix in your carburetor is influenced externally by changes in air temperature or air pressure. If the air pressure is reduced (for example when driving over a mountain pass), the mix is enriched and your motor stutters - which means a smaller jet is needed. If the air pressure is higher (sea level), your motor will starve. Careful - motors can freeze up! Lower temperatures raise the air pressure, your mix is too lean and larger jets are called for. A highly tuned motor needs a fatter mix in winter/season change than in summer.

Your mix is influenced by four factors: changes in the mix ratio, air pressure, amount of air and air induction temperature.

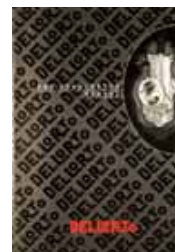


Technical illustrations are taken from:

### Carburetor Tuning Handbook

A must for everyone who wants more technical information about carburetors. The carburetor handbook is available in German, English and Italian. 32 pages crammed with info and lots of illustrations - how to, functions and tuning of the DELL'ORTO carburetor.

**Handbook 32 pages, illustrated, english. (also available in italian, Art. 995500)**



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